# Preliminary Environmental Information Report Volume 1

## Chapter 21 Intertidal and Offshore Ornithology

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LIONLINK

# Contents

# Glossary of Project Terminology

This Glossary has been provided to define terms used across a number of the LionLink Proposed Scheme documents.

| Term | Definition |
|---|---|
| **Applicant, the** | National Grid Lion Link Limited (NGLLL) |
| **Co-ordination** | The process of people or entities working together. |
| **Co-location** | Where different elements of a project, or various projects, are located in one place. |
| **Development Consent Order (DCO)** | An order made by the Secretary of State pursuant to the Planning Act 2008 (as amended) granting development consent for a Nationally Significant Infrastructure Project.<br>It grants consent to develop the approved project and may include (among other things) powers to compulsorily acquire land and rights where required and deemed marine licences for any offshore works. |
| **Draft Order Limits** | The area of land identified as being subject to the DCO application. The Draft Order Limits are made up of the land required both temporarily and permanently to allow for the construction, operation and maintenance, and decommissioning of the Proposed Scheme.<br>All onshore parts of the Proposed Onshore Scheme are located within England and offshore parts of the Proposed Offshore Scheme are located within English territorial waters to 12 Nautical Miles and then up to the United Kingdom (UK) Exclusive Economic Zone (EEZ) boundary at sea. |
| **Dutch Offshore Components** | Is the term used when referring to the offshore elements of the Project within Dutch waters. |
| **Environmental Impact Assessment (EIA)** | The EIA is a systematic regulatory process that assesses the potential likely significant effects of a proposed project or development on the environment. |
| **EIA Scoping Report** | An EIA scoping report defines the proposed scope and methodology of the EIA process for a particular project or development.<br>The EIA Scoping Report for the Proposed Scheme was submitted to the Planning Inspectorate with a request for the Secretary of State to adopt a scoping opinion in relation to the Proposed Scheme on 6 March 2024. |

| Term | Definition |
|---|---|
| **Environmental Statement (ES)** | The ES is a document that sets out the likely significant effects of the project on the environment. The ES is the main output from the EIA process. The ES is published as part of the DCO application. |
| **Exclusive Economic Zone (EEZ)** | The zone in which the coastal state exercises the rights under Part V of the United Nations Convention on the Law of the Sea. These rights relate principally to the water column and may extend to 200 nautical miles from baselines. This is distinct from territorial waters, which for the UK extend 12 nautical miles from the coast. |
| **Landfall** | The proposed Landfall is where the proposed offshore HVDC Submarine Cables are brought ashore and meets with the onshore proposed Underground HVDC Cables. This includes the Transition Joint Bay (TJB).<br>The proposed Landfall will be located at Walberswick, and there will be no permanent above ground infrastructure at the proposed Landfall. |
| **Landfall Site** | The area where the Landfall may be located. |
| **Multi-purpose interconnector (MPI)** | A project where GB interconnection is combined with transmission of offshore generation within GB (and optionally within a connecting state). |
| **National Grid Lion Link Limited (NGLLL)** | The Applicant, a joint venture between National Grid Ventures and TenneT. NGLLL is a business within the wider National Grid Ventures portfolio. |
| **National Grid Ventures (NGV)** | Operates and invests in energy projects, technologies and partnerships to accelerate the development of a clean energy future. This includes interconnectors (such as the LionLink Project), allowing trade between energy markets and the efficient use of renewable energy resources. |
| **Nationally Significant Infrastructure Projects (NSIP)** | Major infrastructure developments in England and Wales for which development consent is required, as defined within Section 14 of the Planning Act 2008 (as amended). This includes any development which is subject to a direction by the relevant Secretary of State pursuant to Section 35 of the Planning Act 2008. |
| **Offshore Hybrid Asset (OHA)** | A project that combines cross-border interconnection with the transmission of offshore generation, this is an overarching term which covers both multi-purpose interconnectors (MPI) and non-standard interconnectors (NSI). |
| **Order Limits** | The maximum extent of land within which the Proposed Scheme may take place, as consented. |

| Term | Definition |
|---|---|
| **Outline Offshore Construction Environmental Management Plan (Outline Offshore CEMP)** | Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Offshore Scheme. |
| **Outline Onshore Code of Construction Practice (Outline Onshore CoCP)** | Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Onshore Scheme. |
| **Planning Act 2008** | The Planning Act 2008 being the relevant primary legislation for national infrastructure planning. |
| **Planning Inspectorate (PINS)** | The Planning inspectorate review DCO applications and make a recommendation to the Secretary of State, who will then decide whether to approve the DCO. |
| **Preliminary Environmental Information Report (PEIR)** | The PEIR is a document, compiled by the Applicant, which presents preliminary environmental information, as part of the statutory consultation process. This is defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as containing information which "is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)" (Section 12 2. (b)). This PEIR describes the Proposed Scheme, sets out preliminary findings of the EIA undertaken to date, and the mitigation measures proposed to reduce effects. The PEIR is published at Statutory Consultation stage for information and feedback. |
| **Project (the)** | The LionLink Project (hereafter referred to as the 'Project') is a proposal by National Grid Lion Link Limited (NGLLL) and TenneT. The Project is a proposed electricity link between Great Britain (GB) and the Netherlands with a capacity of up to 2.0 gigawatts (GW) of electricity and will connect to Dutch offshore wind via an offshore platform in Dutch waters.<br><br>The Project is the collective term used to refer to the proposal for all aspects (onshore and offshore) of the proposed interconnector between GB and the Netherlands. |
| **Proposed Offshore Scheme** | The term used when referring to the offshore elements of the Proposed Scheme, seaward of the |

| Term | Definition |
|---|---|
| | mean high-water springs to the EEZ boundary at sea. |
| **Proposed Scheme** | Used when referring to the GB scheme components of the Project, not including Dutch components. This includes both the onshore and offshore scheme components which are within UK territorial waters and up to the UK EEZ boundary at sea. |
| **Scoping Opinion** | A scoping opinion is requested from the Planning Inspectorate on behalf of the Secretary of State, to inform the requirements of EIA process and ultimately the ES which will be submitted as part of the application for development consent. Through the scoping process, the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought.<br>A Scoping Opinion for the Proposed Scheme was issued by the Planning Inspectorate (on behalf of the Secretary of State) on 16 April 2024. The Applicant received a separate EIA Scoping Opinion from the Marine Management Organisation (MMO) (Reference DCO/2024/00005, dated 04 September 2024) as the MMO were unable to provide opinion to the Planning Inspectorate in time for the April 2024 deadline. |
| **Scottish Power Renewables (SPR) East Anglia One North (EA1N) and East Anglia 2 (EA2) Consents (SPR EA1N and EA2 Consents)** | The Orders made following the Scottish Power Renewables applications for development consent for the following projects:<br>The East Anglia ONE North Offshore Wind Farm Order 2022; and<br>East Anglia TWO Offshore Wind Farm Order 2022 |
| **Statutory Consultation** | Consultation undertaken with the community and stakeholders in advance of the application for development consent being submitted to the Planning Inspectorate, on behalf of the Secretary of state, in accordance with the PA 2008. |
| **TenneT** | Operator of the electricity transmission network across the Netherlands. |
| **Transition Joint Bay (TJB)** | An underground structure at the Landfall Site that house the joints between the offshore cables and the onshore cables. |

Terms and abbreviations specific to this technical chapter contained herein are provided at the end of the document in the **Topic Glossary and Abbreviations.**

# 21 Intertidal and Offshore Ornithology

## 21.1 Introduction

21.1.1 This chapter provides a preliminary assessment of the potential likely significant effects in relation to the intertidal and offshore ornithology from the construction, operation and maintenance, and decommissioning of LionLink (hereafter referred to as 'the Proposed Scheme').

21.1.2 This chapter outlines legislation, policy and guidance that is relevant to intertidal and offshore ornithology, summarises the engagement undertaken to date, sets out the scope and methodology of assessment, and describes the baseline environment. Following this, the likely significant effects of the Proposed Scheme on intertidal and offshore ornithology are assessed taking account of mitigation measures within the design. The need for any additional mitigation is then considered along with any proposals for monitoring and/or enhancement. The chapter concludes with a summary of residual effects.

21.1.3 Intertidal and offshore ornithology aspects considered within this chapter for the Proposed Offshore Scheme are:

a. current baseline conditions;
b. designated sites;
c. protected species; and
d. future baseline conditions.

21.1.4 This chapter should be read in conjunction with **Chapter 2 Description of the Proposed Scheme** of this Preliminary Environmental Information Report (PEIR), which describes the development parameters against which the effects considered in this chapter have been assessed, and **Chapter 5 EIA Approach and Methodology** of this PEIR where the project-wide approach to the assessment methodology is set out.

21.1.5 In addition, there may be interrelationships related to the potential effects on intertidal and offshore ornithology and other disciplines. Therefore, this chapter should be read alongside relevant parts of other chapters; namely:

a. **Chapter 8 Ecology and Biodiversity** of this PEIR - due to the intertidal area which is covered within the onshore scheme;
b. **Chapter 18 Marine Physical Environment** of this PEIR - due to sediment dispersion potentially affecting marine bird foraging grounds;
c. **Chapter 19 Intertidal and Subtidal Benthic Ecology** of this PEIR - due to the close association between some habitats, flora and fauna, and the availability of prey species for intertidal and/or offshore ornithological receptors; and
d. **Chapter 20 Fish and Shellfish** of this PEIR - due to the importance of fish and shellfish as prey species for ornithological receptors and the potential for fish and shellfish to be affected by the Proposed Offshore Scheme.

21.1.6 This chapter is supported by the following appendices and figures, contained within Volume 2 and Volume 3 of this PEIR, respectively:

a. **Habitats Regulation Assessment (HRA) Evidence Plan** provided as part of the statutory consultation;
b. **Habitats Regulation Assessment (HRA) Screening Report** provided as part of the statutory consultation;
c. **Appendix 2.2 Outline Offshore Construction Environmental Management** Plan of this PEIR;
d. **Appendix 29.1 Outline Schedule of Environmental Commitments and Measures** of this PEIR;
e. **Appendix 4.1 Legislation and Policy Register** of this PEIR;
f. **Appendix 4.2 Marine Plan Assessment** of this PEIR;
g. **Appendix 5.3 Transboundary Screening** of this PEIR;
h. **Figure 21.1** to **Figure 21.15** of this PEIR.

21.1.7 As set out in **Chapter 4 Policy and Legislation** of this PEIR, cable installation and some associated activities beyond 12 nautical miles (NM) are exempt under the Marine and Coastal Access Act 2009 (MCAA) as well as repair of the installed cable. This chapter presents a preliminary assessment of the Proposed Offshore Scheme from mean high water springs (MHWS) at the proposed Landfall Site to the boundary between the UK and Netherlands Exclusive Economic Zones (EEZ), including all exempt elements which will not be consented as part of the Development Consent Order (DCO). This is to provide a complete and holistic view of the Proposed Offshore Scheme and any associated impacts. Beyond 12 NM, only cable protection and dredging for sandwave levelling will be included in the Deemed Marine Licence (DML).

## 21.2 Legislation, and policy framework

21.2.1 This section identifies the legislation, policy and guidance that has informed the assessment of the likely significant effects on intertidal and offshore ornithology.

21.2.2 The legislation and planning policy which has informed the assessment of effects with respect to intertidal and offshore ornithology is provided within **Appendix 4.1 Legislation and Policy Register** of this PEIR**.** A preliminary marine plan assessment is provided as **Appendix 4.2 Marine Plan Assessment** of this PEIR.

21.2.3 **Table 21.1** lists the legislation relevant to the assessment of the likely significant effects on intertidal and offshore ornithology.

**Table 21.1: List of relevant legislation for intertidal and offshore ornithology assessment**

| Legislation | Relevance to assessment |
|---|---|
| The Planning Act 2008 (Ref 1) | An Act to establish the Infrastructure Planning Commission and make provision about its functions; to make provision about, and |

| Legislation | Relevance to assessment |
|---|---|
| | about matters ancillary to, the authorisation of projects for the development of nationally significant infrastructure. |
| The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 2) | This Act transposes EU Directive 2011/92/EU (the EIA Directive) into UK law for nationally significant infrastructure projects, ensuring environmental safeguards while potentially streamlining the process. |
| Marine and Coastal Access Act 2009 (Ref 3) | The MCAA provides a framework for managing and protecting marine and coastal areas, promoting sustainable development, enhancing public access to the coast, and conserving marine biodiversity and habitats, including establishing marine protected areas and coastal access routes. |
| Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (Ref 4) | The Marine Works (Environmental Impact Assessment) Regulations 2007 require certain types of projects that have the potential to significantly affect the environment to submit an EIA before a marine licence decision is made. |
| The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref 5) | The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 are the principal secondary legislation that transposed the EU Habitats Directive into UK law, whereby the Regulatory Authority must consider any likely significant effects of a development on the qualifying features of European sites.<br><br>The Conservation of Habitats and Species Regulations 2017 applies out to 12NM from the coastline; the Conservation of Offshore Marine Habitats and Species Regulations 2017 applies from 12NM to the boundary of the UK EEZ.<br><br>These are collectively referred to as ‘the Habitats Regulations’.<br><br>The Habitats Regulations provide a framework for the protection of European Sites, which include Special Protection Areas (SPAs), designated to protect wild bird species. Under the Regulations, Applicants must demonstrate that a proposed development would not adversely affect the integrity of a European site either alone or in combination with other plans or projects. This is done through the Habitats Regulations Assessment (HRA) process. The process requires ‘competent authorities’ to carry out an appropriate assessment of any proposal likely to affect an SPA, to seek advice from Natural England and/or the Joint Nature Conservation Committee (JNCC), and to not approve an application that would have an adverse effect on the integrity of an SPA.<br><br>Ramsar sites are designated under the Convention on Wetlands (Ramsar, Iran, 1971), known as the "Ramsar Convention" to protect wetlands of international importance (Ref 7). The vast majority of Ramsar sites are also classified as SPAs. |
| The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (Ref 6) | |

| Legislation | Relevance to assessment |
|---|---|
| The Wildlife and Countryside Act 1981 (Ref 9) | The Wildlife and Countryside Act 1981 (as amended) provides legal protection for marine habitats and species within the UK within 12NMof the coast. This Act prohibits killing, injuring, or taking any wild bird, as well as disturbing their nests or eggs. |
| Natural Environment and Rural Communities (NERC) Act (Ref 10) | Section 41 of the NERC Act 2006 refers to a published list of habitats and species which are of principal importance for the conservation of biodiversity in England, which includes several intertidal and marine birds. |

### National Policy

21.2.4 The primary policy basis for deciding whether to grant a Development Consent Order for the Proposed Scheme are the National Policy Statements (NPSs), and of primary relevance the Overarching NPS for Energy (NPS EN-1) (Ref 11) and the NPS for Renewable Energy Infrastructure (NPS EN-3) (Ref 13) and the UK Marine Policy Statement (Ref 12). These set out policies to guide how applications for development consent for energy infrastructure should be decided and how the effects of such infrastructure are considered.

21.2.5 **Table 21.2** lists the paragraphs from NPS EN-3 that are relevant to the intertidal and offshore ornithology assessment. It also sets out where these policy requirements are addressed within the chapter.

**Table 21.2: List of relevant national policy for intertidal and offshore ornithology assessment**

| Relevant paragraph reference | Summary of policy requirement | Where addressed in PEIR |
|---|---|---|
| **NPS EN-3** | | |
| Paragraph 2.8.136 | Notes the potential impacts on birds. Although this is written in regard to offshore windfarms, the impacts of direct habitat loss, disturbance, displacement and impacts on prey species and prey habitat are relevant to the Proposed Scheme. | A preliminary assessment of the impact of displacement has been provided in in **Section 21.8.** |
| Paragraph 2.8.242 | Refers to the avoidance or minimisation of construction vessels operating in areas where seabirds are rafting during sensitive periods. | The baseline establishes areas within the Proposed Offshore Scheme where and when rafting birds are likely to be present. A preliminary assessment of visual disturbance and displacement is presented within **paragraphs 21.8.6** to **21.8.36.** An Outer Thames Estuary SPA red-throated diver vessel disturbance assessment will be included in the ES. |

| Relevant paragraph reference | Summary of policy requirement | Where addressed in PEIR |
|---|---|---|
| Paragraph 2.8.316 | Notes the relevance of the conservation status of seabirds and that when the Secretary of State makes a decision, they should be satisfied that cumulative and in-combination impacts have been considered. | **Chapter 28 Cumulative Effects** presents the approach to be taken to assess cumulative impacts within the ES. |

21.2.6 The local policies listed in **Table 21.3** are considered relevant to the intertidal and offshore ornithology assessment.

**Table 21.3: List of relevant local policy for intertidal and offshore ornithology assessment**

| Local planning authority | Relevant local policy | Relevance to assessment |
|---|---|---|
| Marine Management Organisation (MMO) | East Inshore and East Offshore Marine Plans (Ref 14) | Marine plans set out the priorities and direction for future planning within the plan area and provide guidance on activities to avoid or promote. **Appendix 4.2 Marine Plan Assessment** of this PEIR outlines how the Proposed Offshore Scheme complies with the policies and objectives for the East Inshore and East Offshore Marine Plan area. Of relevance to this assessment are Policy BIO1 which requires Applicants to consider the need to protect biodiversity as a whole. The preliminary assessment of effects is presented in **Section 21.8** and embedded design mitigation and control measures are presented in **Section 21.7** of this chapter. |

## 21.3 Consultation and engagement

21.3.1 This section describes the outcome of, and response to, the EIA Scoping Opinion (Ref 15) in relation to the intertidal and offshore ornithology assessment.

21.3.2 It also provides details of the ongoing technical engagement that has been undertaken with key stakeholders and provides a brief overview of the non-statutory public consultation undertaken to date.

21.3.3 Feedback from engagement and consultation are used to define the assessment approach and to ensure that appropriate baseline information is used.

21.3.4 It should be noted that feedback is also used to drive the design of the Proposed Scheme to avoid, prevent and reduce any likely environmental effects. **Chapter 3**

**Alternatives and Design Evolution** of this PEIR reports how the Proposed Scheme design has evolved in response to feedback and details of proposed embedded design (Primary) mitigation and standard good practice (Tertiary) mitigation measures relevant to the Intertidal and Offshore Ornithology assessment are provided in **Section 21.7** of this chapter.

## Consultation

### Non-Statutory Consultation and Supplementary Non-Statutory Consultation

21.3.5 Feedback received from stakeholders following the close of our 2022 and 2023 consultation is outlined within the **Interim Non-Statutory Consultation Feedback Summary Report 2023** (Ref 16) and **Supplementary Non-Statutory Consultation Summary Report 2024** (Ref 17). No feedback was received from either consultation in relation to the intertidal and offshore ornithology assessment.

### EIA Scoping Opinion

21.3.6 An EIA Scoping Opinion was adopted by the Planning Inspectorate on behalf of the Secretary of State on 16 April 2024. A full list of the EIA Scoping Opinion comments and responses is provided in **Appendix 5.1 Preliminary Scoping Opinion Responses**, in this PEIR.

21.3.7 The Applicant received a separate EIA Scoping Opinion from the Marine Management Organisation (MMO) (Ref 15) as the MMO were unable to provide opinion to the Planning Inspectorate in time for the April 2024 deadline. MMO deferred to Natural England's comments received by the Planning Inspectorate with respect to the suitability of the assessment with regards to Marine Protected Areas.

21.3.8 Comments received from the Planning Inspectorate in relation to intertidal and offshore ornithology are provided in **Table 21.4.**

**Table 21.4: Preliminary response to Planning Inspectorate and and Natural England Scoping Opinion for intertidal and offshore ornithology**

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| Planning Inspectorate ID 3.16.1 | The Planning Inspectorate did not agree to scope out the effects to terns, gulls, kittiwakes and gannets from visual/ physical disturbance or displacement during construction and operation. The ES should include an assessment of this matter or otherwise demonstrate, with evidence of agreement from relevant consultation bodies, an absence of likely significant effects. | The Applicant noted the comment. A preliminary assessment of impacts to terns, gulls, kittiwakes and gannets for visual/physical disturbance was undertaken and can be seen in **paragraphs 21.8.29** to **21.8.32** |

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| Planning Inspectorate ID 3.16.2 – 3.16.5 | The Inspectorate did not agree to scope out effects from increase and deposition of suspended sediments on divers, grebes and mergansers (ID 3.16.2), seaducks, geese and swans (ID 3.16.3), auks (ID 3.16.4) and terns, gulls, kittiwakes and gannets (ID3.16.5) without evidence demonstrating clear agreement with the relevant statutory bodies. The ES should include an assessment where significant effects are likely to occur.<br>The Inspectorate does agree, however, that gulls do not need to be considered in the assessment on the basis that they do not dive for food and are absent from the study area. | A preliminary assessment of the impacts of temporary increase and re-deposition of suspended sediments on divers, grebes and mergansers and seaducks, geese and swans has been provided in **paragraphs 21.8.49** to **21.8.49**, for auks in **paragraphs 21.8.54** to **21.8.57** and for terns, gulls, kittiwakes and gannets in **paragraphs 21.8.58** to **21.8.61.** |
| Planning Inspectorate ID 3.16.6 | The Inspectorate agreed that effects to waders and harriers from temporary increase and redeposition of suspended sediments during construction and operation can be scoped out of the assessment on the basis that wading birds and harriers do not dive for food and would not be affected by temporary changes in water clarity from increased suspended solids. | Impact pathway continues to remain scoped out. |
| Planning Inspectorate ID 3.16.7 | The Planning Inspectorate did not agree to scope out effects to all bird species from changes in distribution of prey or target species from temporary loss of habitat (excluding external cable protection) during construction and operation. The assessment should consider effects arising from deployment of additional cable protection during operation of the Proposed Development, which could also impact prey availability. | A preliminary assessment of the changes in distribution of prey species due to disturbance or physical displacement assessment for all species is presented in **paragraphs 21.8.62** to **21.8.68.** |
| Planning Inspectorate ID 3.16.8 | The Inspectorate agrees that effects to all bird species from accidental spills can be scoped out on the basis that the control and management measures proposed in the scoping report should be sufficient to address the likely impacts and avoid a likely significant effect. The ES should include details of the mitigation and explain how its delivery is assured with reference to relevant documents. | Details of control measures and how these will be secured through the DCO have been included in **Section 21.7**. |
| Planning Inspectorate ID 3.16.9 | It should be clear in the ES how implementation of NE's 'Best Practice Protocol for Vessels in Red-throated Diver SPAs' would be secured through the DCO. | Details of control measures and how these will be secured through the DCO have been included in **Section 21.7**. |
| Planning Inspectorate | For the avoidance of doubt, the Inspectorate understands that the assessment of physical | A preliminary assessment of the disturbance or physical |

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| ID 3.16.10 | disturbance or displacement would include assessment of noise impacts, including underwater sound. | displacement assessment for all species is presented in **paragraphs 21.8.6** to **21.8.36.** |
| Planning Inspectorate ID 3.16.11 | The Inspectorate does not consider that only species of designated sites should be assessed; as a minimum, the ES should also assess effects on species present within the zone of influence that are legally protected or which qualify as species of principal importance. | The preliminary assessment considers all species established as present within the study area. |
| Planning Inspectorate ID 3.16.12 | Paragraph 21.7.2 Offshore bird surveys.<br>The Scoping Report states that offshore bird surveys are not considered necessary on the basis that construction works would be temporary and transient. Table 21-7 of the Scoping Report indicates that reference will also be made to data collected from nearby offshore windfarm projects.<br>Paragraph 21.2.2 of the Scoping Report describes concerns raised by relevant consultation bodies during non-statutory consultation about potential impacts to red-throated diver of the Outer Thames Estuary SPA and the need to ensure that data on species distribution and density is adequate and current, especially in relation to red-throated diver. It is stated that the feedback led to changes in the position of the offshore cable corridor, but it is unclear as to how, or if, this would have resolved the concerns raised.<br>The impact assessment in the ES must be undertaken based on a robust understanding of the baseline environment. Effort should be made to agree the method of establishing the baseline, including the requirement for site specific surveys, with relevant consultation bodies including the JNCC and NE. The ES should include evidence of agreement or otherwise regarding the approach. | The Applicant consulted with Natural England and JNCC in regard to the red-throated diver. It was agreed that aerial bird surveys were not necessary to be undertaken but the most up to date data should be used. The preliminary assessment has used the most up to date Outer Thames Estuary SPA Digital aerial survey 2018 to inform this chapter. This can be seen in **paragraphs 21.6.37** to **21.6.41** |
| Planning Inspectorate ID 3.16.13 | *Paragraph 21.7.5 Intertidal bird surveys*.<br>The Scoping Report describes the proposed scope and method of intertidal bird surveys, which are proposed to continue for 12 months. It is stated that the survey methodology is based on guidance for onshore wind farms provided by Scottish Natural Heritage (SNH) in the absence of a clearly defined methodology for land-based inshore bird surveys for interconnector projects. | The agreed survey methodology can be found in **Appendix 8.12 Baseline Report – Inshore and Beach Breeding Survey Report** and **Appendix 8.13 Baseline report Wintering Bird Survey Report 23-24** of this PEIR. |

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| | For the avoidance of doubt, the Inspectorate understands that the survey effort will also cover waterbirds that may be using the intertidal habitat. Effort should be made to agree the survey method and scope with relevant consultation bodies; evidence of agreement should be presented in the ES. If the SNH guidance is used as the basis for the survey methodology, the ES should provide a detailed explanation of why its use is appropriate for the Proposed Development. | |
| Planning Inspectorate ID 3.16.14 | The ES must present the baseline data clearly, including information on the location of the vantage points used in the bird surveys, and predicted numbers of individuals of each species likely to be affected by the Proposed Development. The ES must also explain how the baseline data has been derived from published sources.<br>Table 21-7 does not refer to data that may be available from the Wetland Bird Survey (WeBS), on the British Trust for Ornithology (BTO) website, or further JNCC sources such as the atlas of seabird distribution. The ES should include data from these sources where relevant. | The preliminary assessment has used multiple data sources to inform the current baseline description including: WeBS and JNCC atlas of seabird distribution. This is provided in **Section 21.6** and in **Table 21.7.** |
| Planning Inspectorate ID 3.16.15 | *Tables 21-8 and 21-9 Assessment criteria.*<br>The Inspectorate is unclear where the proposed assessment criteria is derived from. The ES should provide a justification as to why the proposed criteria is appropriate as a basis for determining likely significant effects, including reference to relevant guidance. The following factors should be addressed:<br>• species that are not connected with an international or nationally designated site should be included, e.g. those that benefit from other legal protections or are priority species;<br>• clarification as to how value and sensitivity would be assigned to habitats used by birds;<br>• clarification as to what is meant by activity outside of a sensitive season, and why it would be appropriate to downgrade the value of qualifying features of international or nationally designated sites on that basis; | With respect to bullet 1, 3 and 4 the assessment criteria that was proposed within the EIA Scoping Report has been updated in response to the comment. For the preliminary assessment new topic specific assessment criteria have been used and clarity or justification provided to address the comment in **paragraph 21.4.27** to **21.4.33** and **Table 21.8** and **Table 21.9.**<br>The new criteria been agreed with Natural England, JNCC and the MMO 23 June 2025.<br>With respect to bullet point 2, the preliminary assessment has been informed by the conclusions of **Chapter 19 Intertidal** and **Subtidal Benthic Ecology and Chapter 20 Fish and Shellfish** of this PEIR; if |

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| | • the information that would be used to ascertain tolerance of disturbance in determining sensitivity; and<br>• explanation of the approach if there is an overlap in description between categories, i.e. confirm that the higher category would be assigned as a worst case.<br>The ES should confirm how effect significance is proposed to be determined. | these assessments conclude no significant adverse effects on habitats or prey species it can be concluded that there would be no significant adverse effects on bird species. |
| Planning Inspectorate ID 3.16.16 | The Scoping Report presents limited information on the methods proposed to assess impacts, other than confirming that results from sediment dispersion modelling and sandeel and Atlantic herring habitat assessment would be used. Paragraph 21.7.14 also states that where impacts are not predicted to be significant, simple assessments using an evidence-based, proportionate approach would be undertaken. No information is presented about how visual/ physical impacts would be assessed.<br>The ES should clearly describe the methods used to quantify the extent of disturbance to the qualifying features, their use justified with reference to appropriate guidance and/ or agreement with relevant consultation bodies. The Applicant's attention is drawn to the comments of JNCC (Appendix 2 of the Scoping Opinion) regarding the proposed assessment method for disturbance effects to red-throated diver. | The preliminary assessment has assessed the visual/physical impacts based on guidance provided by JNCC in their response to the EIA DCO Report. The number of birds potentially displaced has been calculated using the Irwin et al. (2019) distribution maps (Ref 24). **Section 21.8** outlines the assessment approach and conclusions. An Outer Thames Estuary SPA red-throated diver vessel disturbance assessment will be included in the ES |
| Planning Inspectorate ID 3.16.17 | The ES should include a figure illustrating any international and national designated sites with bird qualifying features that are located within the study area. | **Figure 21.1** of this PEIR, presents the Draft Order Limits of the Proposed Offshore Scheme in relation to designated sites. |
| Natural England 15. Red-throated Divers | Natural England highlighted their increasing concerns in relation to disturbance and/or displacement of red-throated divers features from the more persistent presence of offshore wind farm, energy and oil and gas related vessel activity which could make a meaningful contribution to in-combination effects to the Outer Thames Estuary SPA. They advised consideration of seasonal timing restrictions (to avoid months of November to March inclusive), avoidance of vessel transit routes through the Outer Thames Estuary SPA outside of existing | The best practice measures to be implemented by the Proposed Offshore Scheme are outlined in **Section 21.7,** with details of how they would be secured. The preliminary assessment has identified that for certain construction activities there is the potential for Significant disturbance to red-throated diver within the Outer Thames Estuary SPA (see |

| Scoping Opinion ID | Scoping Opinion Comment | How this is addressed |
|---|---|---|
| | navigation routes during winter months and the use of best practice measures to minimise disturbance to red-throated diver namely:<br>• Selecting routes (when transiting to site) that avoid aggregations of red-throated diver where practicable.<br>• Restricting (to the extent possible) vessel movements when transiting to the site to existing navigation routes (where the densities of divers are typically relatively low).<br>• Avoidance of over-revving of engines (to minimise noise disturbance); and<br>• Briefing of vessel crew on the purpose and implications of these vessel management practices (through, for example, toolbox talks).<br>However, they highlighted that dependent on the level of proposed activity across the designated site the best practice protocol as set out above may not minimise the in-combination impacts to an acceptable level, and therefore a full seasonal restriction could be required. | **paragraphs 21.8.6** to **21.8.11**). Additional measures such as seasonal restrictions limited to certain high-risk activities are to be discussed with NE and JNCC and would be confirmed in the ES. |
| Natural England Appendix B, Table items 24 | While changes to prey distribution is considered due to cable repairs, the section does not include deployment of additional cable protection. While Natural England has concerns about the deployment of cable protection throughout the lifetime of a project, we consider deployment up to ten years after construction could be included. Therefore, would note that the impact to prey distribution may also include through deployment of additional cable protection. | A preliminary assessment has been provided in **paragraphs 21.8.62** to **21.8.68.** |

### Engagement

21.3.9 This section provides details of the ongoing technical engagement that has been undertaken with stakeholders in relation to intertidal and offshore ornithology. Engagement on the topic has been undertaken since 2023 with the Statutory Nature Conservation Bodies (SNCBs).

### Key stakeholders

21.3.10 Key stakeholders with views and concerns regarding intertidal and offshore ornithology have been identified as including:

a. Natural England;
b. JNCC; and
c. Suffolk Wildlife Trust.

**Table 21.5: Key non statutory consultation feedback for intertidal and offshore ornithology**

| Stakeholder | Comment | Applicant response |
|---|---|---|
| JNCC | Noted concerns with respect to displacement of red-throated diver during winter periods. Recommended that Natural England's 'Best Practice protocol for vessels in red-throated diver SPAs' should be implemented. | The Applicant are aware of the concern and have provided a preliminary assessment of the effect of displacement on red-throated diver within **Section 21.8**. Mitigation is to be discussed further with JNCC and Natural England ahead of the ES. A technical report is being prepared and consulted on through stakeholder engagement; this will be included in the ES. |
| Natural England | Identified a risk on relying on existing protected site survey data and suggested project specific surveys were undertaken. | The Applicant reached agreement with Natural England that aerial bird surveys were not proportionate with the activity proposed and that they were not required. It was noted that the highest risk area for vessel disturbance would be at the landfall during cable pull-in when a larger number of vessels are used. Wintering bird surveys undertaken for the Proposed Onshore Scheme include a landfall vantage point at which a radius of 2km from shore (or further depending on the weather) could be observed. Natural England agreed with this methodology. |
| Natural England | Additionally Natural England consider that any actions that occur on more than two consecutive days can become a high risk of causing displacement to red-throated diver within the Outer Thames Estuary SPA. As works associated with Horizontal Directional Drilling (HDD) will involve vessel activities/presence for longer than two days then it would be considered high risk. In order to de-risk the project NE advised that the Applicant should consider a seasonal restriction on works between 01 Nov and 31 March of every year. | A preliminary assessment of the effects on red-throated diver has been provided in **paragraph 21.8.4**. The preliminary assessment has identified that for certain construction activities there is the potential for Significant disturbance to red-throated diver within the Outer Thames Estuary SPA (see **paragraphs 21.8.9** to **21.8.11**). Additional measures such as seasonal restrictions limited to certain high-risk activities are to be discussed with NE and JNCC and would be confirmed in the ES. |
| Suffolk Wildlife Trust | Raised concerned about changes in prey species for little tern. | A preliminary assessment of changes in prey availability is presented in **paragraphs 21.8.62** to **21.8.68.** |

## 21.4 Assessment methodology

21.4.1 This section outlines the methodology followed to assess the potential likely significant effects of the Proposed Offshore Scheme in relation to intertidal and offshore ornithology including:

a. scope of the assessment;
b. study area;
c. assessment scenarios;
d. methodology;
e. assessment criteria; and
f. cumulative assessment.

21.4.2 This section provides a description of how receptor sensitivity, magnitude of impact and significance of effects are all described and assigned to the assessment.

21.4.3 The project-wide approach to the assessment methodology is set out in **Chapter 5 EIA Approach and Methodology** of this PEIR.

### Scope of the assessment

21.4.4 Potential likely significant effects requiring assessment may be temporary or permanent and may occur during construction, operation and maintenance and decommissioning. Potential likely significant effects on intertidal and offshore ornithology receptors within the scope of the assessment are summarised in **Table 21.6**. The scope of the assessment has responded to feedback received as detailed in **Section 21.3**.

**Table 21.6: Summary of the scope for intertidal and offshore ornithology assessment**

| Receptor | Construction | Operation and Maintenance | Decommissioning |
|---|---|---|---|
| a. Outer Thames Estuary SPA<br>b. Divers, grebes and mergansers<br>c. Seaducks, geese and swans<br>d. Auks<br>e. Terns, gulls, kittiwakes and gannets<br>f. Waders and harriers | Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment within Draft Order Limits | Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment within Draft Order Limits. | Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment within Draft Order Limits. |

| Receptor | Construction | Operation and Maintenance | Decommissioning |
|---|---|---|---|
| a. Outer Thames Estuary SPA | Disturbance and displacement due to transiting vessels | Disturbance and displacement due to transiting vessels | Disturbance and displacement due to transiting vessels |
| b. Outer Thames Estuary SPA<br>c. Divers, grebes and mergansers<br>d. Seaducks, geese and swans<br>e. Auks<br>f. Terns, kittiwakes and gannets | Temporary increase and re-deposition of suspended sediments. | Temporary increase and re-deposition of suspended sediments. | Temporary increase and re-deposition of suspended sediments. |
| All bird species | Changes in distribution of prey or target species. | Changes in distribution of prey or target species. | Changes in distribution of prey or target species. |
| All bird species | Transboundary impacts associated with visual/physical disturbance. | Transboundary impacts associated with visual/physical disturbance. | Transboundary impacts associated with visual/physical disturbance. |
| All bird species | Transboundary impacts associated with temporary increase and re-deposition of suspended sediments. | Transboundary impacts associated with temporary increase and re-deposition of suspended sediments. | Transboundary impacts associated with temporary increase and re-deposition of suspended sediments. |
| All bird species | Transboundary impacts associated with changes in prey availability. | Transboundary impacts associated with changes in prey availability. | Transboundary impacts associated with changes in prey availability. |

### Study area

21.4.5 This section describes the spatial scope (the area which may be impacted) for the assessment as it applies to intertidal and offshore ornithology.

21.4.6 The spatial scope of the impact assessment for intertidal and offshore ornithology covers the area of the Proposed Offshore Scheme contained within the Draft Order Limits, together with the study area, described as follows.

21.4.7 The Proposed Offshore Scheme routes from Walberswick across the Southern North Sea to the boundary between the English and Dutch EEZ. The Draft Order Limits for the Proposed Offshore Scheme is illustrated in **Figure 21.1** of this PEIR.

21.4.8 The study area for the intertidal and offshore ornithology assessment has been defined with reference to the maximum likely zone of influence over which the Proposed Offshore Scheme may incur potential significant effects (noting that the zone of influence may vary by species or phase of development), with consideration of the need to gather sufficient data to account for worst case scenarios for the impact assessment. It takes into consideration:

a. Seabird foraging ranges (Ref 18, Ref 19);
b. Recent recommendations from SNCBs regarding maximum disturbance/displacement ranges for sensitive bird species (Ref 41); and
c. Maximum tidal excursion to encompass the potential impact pathway from increased sediment concentrations, which could affect a bird's ability to seek prey.

21.4.9 The defined zones of influence are feature-specific, this can be for functional groups or individual species where relevant. Where the zone of influence varies between individuals within a functional group, the largest zone of influence for that functional group has been used in the assessment.

21.4.10 The study area includes the Draft Order Limits to MWHS plus an additional 15km buffer either side as illustrated in **Figure 21.1** of this PEIR. This is a precautionary maximum zone of influence that encompasses the worst-case scenario of potential impact pathways from increased suspended sediment concentrations. It is based on the conclusions of **Chapter 18 Marine Physical Environment** of this PEIR. According to advice from SNCBs, a maximum displacement buffer of 10km should be applied to consider disturbance effects on red-throated diver (*Gavia stellata*) and a displacement buffer of at least 4km should be applied for other diving birds (Ref 41). The 15km buffer used to define the study area is therefore sufficiently precautionary to cover the potential effects of displacement as well as potential effects resulting from increases in turbidity. The study area is illustrated in **Figure 21.1** of this PEIR, alongside the Draft Order Limits and designated sites with ornithological features.

21.4.11 In order to identify designated sites and priority species, mean maximum breeding foraging ranges ±1 Standard Deviation (SD) have been identified using Woodward et al (Ref 19), as there is the possibility that species from distant SPA's may be foraging within or passing through the Draft Order Limits. The foraging ranges of individual species (where available) can be seen in **Table 21.11**. Although the foraging ranges were generated to highlight potential connectivity between breeding bird colonies and offshore wind farms, they can also be used to identify species that may travel within the ZoI of the Proposed Offshore Scheme.

21.4.12 Whilst applying mean maximum foraging radius would encompass most of a population's home-range area, the overall size of the predicted foraging areas around the colony would potentially make it too large to be a useful management tool (Ref 45). Similarly, the assumption that seabirds are uniformly distributed out to some threshold distance from their colonies, such as their putative maximum

foraging range, is unrealistic (Ref 18). Therefore, given the scale of the Proposed Offshore Scheme, it is considered disproportionate to identify relevant SPAs on the basis of maximum foraging ranges of their protected features, as there is no evidence to support an impact pathway given the scale and nature of the Proposed Offshore Scheme.

21.4.13 As such a refined list of seabird SPAs has been included in **Table 21.14**. This is based on the SNCB Joint Interim Advice (Ref 41) which identifies that the priority species for assessment of displacement effects are typically diver and sea duck species, common guillemot (*Uria aalge*), razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*) and northern gannet (*Morus bassanus*). It is noted that this guidance relates specifically to offshore wind farm (OWF) developments (in relation to the wind farm arrays).

21.4.14 However, it is recognised that these species are also likely to be sensitive to vessel presence and noise, leading to disturbance and displacement. For example, it is advised by Natural England that there is potential for red-throated diver (*Gavia stellata*) to be displaced from up to 2km radius from vessels. Razorbill and Atlantic puffin are also identified as being susceptible to displacement due to vessel traffic (Ref 19). SPAs have been considered relevant if designated for priority seabird (common guillemot, razorbill and Atlantic puffin), diver and sea duck species identified as being sensitive to disturbance / displacement (Ref 41) or a species which is identified as having a high habitat specialisation, which could potentially be present within the Draft Order Limits based on their mean maximum foraging range ±1 SD.

21.4.15 Although not included in the Joint Interim Advice (Ref 40), SPAs with common tern (*Sterna hirundo*) as a designated feature are also considered. Tern species are not typically sensitive to disturbance however, other tern species in **Table 21.11** have a habitat specialisation score of 3 or more and therefore, it can be assumed that common tern would be similar.

21.4.16 Most species of seaduck, geese and swans are sensitive to noise and visual disturbance from vessel traffic (Ref 46; Ref 47), therefore if the Proposed Offshore Scheme is within 4km of a designated site which has a species of seaduck, geese or swan as a qualifying feature, this assessment considers it relevant.

21.4.17 Waders and harriers use the intertidal area for foraging and may use coastal habitats for roosting. These groups are sensitive to visual and noise disturbance which disturbs the intertidal habitat. SPAs and Ramsar sites which overlap with the DOL have been included in the assessment.

## Table 21.7: Foraging ranges used to screen relevant SPAs

| Common Name | Disturbance Susceptibility* | Habitat Specialisation* | Foraging ranges (km) ± 1SD ** | Confidence ** |
|---|---|---|---|---|
| **Priority Seabirds** | | | | |
| Common guillemot | 3 | 3 | 55.5±39.7 | Highest |
| Razorbill | 3 | 3 | 73.8±48.4 | Good |
| Atlantic puffin | 2 | 3 | 137.1±128.3 | Good |
| **Divers, grebes and mergansers** | | | | |
| Black-throated diver (*Gavia arctica*) | 5 | 4 | No data | No Data |
| Red-throated diver | 5 | 4 | 9 | Low |
| Great northern diver (*Gavia immer*) | 5 | 3 | No data | No data |
| White-billed diver (*Gavia adamsii*) | 5 | 4 | No data | No data |
| European Shag (*Gulosus aristotelis*) | 3 | 3 | 13.2±10.5 | Highest |
| Great cormorant (*Phalacrocorax carbo*) | 4 | 3 | 25.6±8.3 | Moderate |
| Red-breasted merganser (*Mergus serrator*) | 3 | 4 | No data | No data |
| Goosander (*Mergus merganser*) | 4 | 4 | No data | No data |
| Great crested grebe (*Podiceps cristatus*) | 3 | 4 | No data | No data |
| Slavonian grebe (*Podiceps auratus*) | 3 | 4 | No data | No data |
| **Seaducks** | | | | |
| Common scoter (*Melanitta nigra*) | 5 | 4 | No data | Uncertain |
| Common goldeneye (*Bucephala clangula*) | 4 | 4 | No data | No data |
| Velvet scoter (*Melanitta fusca*) | 5 | 3 | No data | Moderate |
| Common eider (*Somateria mollissima*) | 3 | 4 | 21.5 | Poor |
| Greater scaup (*Aythya marila*) | 4 | 4 | No data | No data |

| Common Name | Disturbance Susceptibility* | Habitat Specialisation* | Foraging ranges (km) ± 1SD ** | Confidence ** |
|---|---|---|---|---|
| Long-tailed duck (*Clangula hyemalis*) | 3 | 4 | No data | Uncertain |
| **Auks** | | | | |
| Black guillemot (*Cepphus grylle*) | 3 | 4 | 4.8±4.3 | Uncertain |
| **Terns and gulls** | | | | |
| Little tern (*Sternula albifrons*) | 2 | 4 | 5 | Moderate |
| Arctic tern (*Sterna paradisaea*) | 2 | 3 | 25.7±14.8 | Good |
| Sabine's gull (*Xema sabini*) | 2 | 3 | No data | No data |
| Black tern (*Chlidonias niger*) | 2 | 3 | No data | No data |
| Roseate tern (*Sterna dougallii*) | 2 | 3 | 12.6±10.6 | Moderate |
| Sandwich tern (*Thalasseus sandvicensis*) | 2 | 3 | 34.3±23.2 | Moderate |
| Common tern (*Sterna hirundo*) | No data | No data | 18.0±8.9 | Good |
| Black-headed gull (*Chroicocephalus ridibundus*) | 1 | 3 | 18.5 | Uncertain |

* (Ref 41) ** (Ref 19)

Note: where a foraging range has not been prescribed for a species then we have assumed the highest foraging range for the relevant group applies.

Key to confidence of data score:

Highest > 5 direct studies; graphs and standard deviation suggest relatively low variability between sites and hence higher confidence that estimates are likely to be representative for unsampled sites.

Good > 5 direct studies; graphs and standard deviation show wider variability between sites, hence lower confidence that estimates will be representative for all sites.

| | |
|---|---|
| Moderate | 2-5 direct studies |
| Low | Indirect measures or only 1 direct study |
| Uncertain | Survey-based estimates |
| Poor | Few survey estimates or speculative only |

### Assessment scenarios

21.4.18 **Chapter 5 EIA Approach and Methodology** of this PEIR, provides an overview of the project's approach to the temporal scope (the time scales over which impacts may occur) of the EIA. This section describes the temporal scope for the assessment as it applies to the intertidal and offshore ornithology.

21.4.19 The temporal scope has been informed by **Chapter 2 Description of the Proposed Scheme** of this PEIR. The temporal scope of the assessment of intertidal and offshore ornithology is consistent with the period over which the Proposed Offshore Scheme would be carried out. It covers the period from award of consent to the anticipated end of the Proposed Scheme lifespan.

21.4.20 It assumes construction of the Proposed Offshore Scheme would commence at the earliest 2028 and complete by 2032. Operation would commence in 2032 with periodical maintenance required during the operational phase of the Proposed Offshore Scheme. It is assumed that maintenance and repair activities could take place at any time during the life span of the Proposed Offshore Scheme.

21.4.21 It is during the construction phase of the Proposed Offshore Scheme that direct impacts to intertidal and offshore ornithology receptors are most likely to occur. Indirect impacts may also occur during construction-related activities such as cable and burial activities which would cause habitat loss which in turn could lead to a decline in prey species.

21.4.22 The Proposed Offshore Scheme would be licenced for 40 years. At this point, either an extension to the licence would be requested, supported by the necessary environmental assessment, or decommissioning would take place. If decommissioning is required, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of two years and, with the removal of visible infrastructure, effects would reduce over the course of that period.

21.4.23 Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, based on the information available, the Applicant 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 expected that the development consent would include a requirement for a written scheme of decommissioning for approval by the relevant planning authority and in line with The Crown Estate requirements.

## Baseline methodology

### Data collection

21.4.24 Baseline data collection has been undertaken to obtain information over the study area. This section provides the approach to collecting baseline data.

21.4.25 The following sources of data have been utilised to inform the baseline with respect to intertidal and offshore ornithology as shown in **Table 21.7**. In addition to these data sources, the intertidal and offshore ornithology assessment draws on environmental baseline data collated for other topics, specifically, baseline data presented in **Chapter 8 Ecology and Biodiversity** and **Chapter 18 Marine Physical Environment** of this PEIR.

21.4.26 Baseline data collection for the intertidal and offshore ornithology assessment has been a combination of desk based and project specific survey data.

**Table 21.8: Data sources used to inform the intertidal and offshore ornithology assessment**

| Source of data | Baseline data |
|---|---|
| Natural England's Conservation Advice for Outer Thames SPA (2009) (Ref 20) | Natural England site details for Outer Thames Estuary SPA including summaries of site characteristics and designated features, conservation objectives and advice on operations and maintenance and seasonality information provides guidance on project activities and timings in particular for the red-throated diver. |
| JNCC 2020, Outer Thames Estuary SPA (Ref 21) | JNCC site details for the Outer Thames Estuary SPA including site characteristics, protected features, conservation objectives and advice. |
| UK Offshore Energy Strategic Environmental Assessment – OESEA4 Environmental Report 2022. (Ref 22) | Literature review of knowledge of marine bird baseline. |
| Waggitt et al 2019 (Ref 23) | Distribution maps of cetaceans and seabird populations in the North-East Atlantic. |
| Digital video aerial surveys of red-throated diver in the Outer Thames Estuary Special Protection Area 2018 (Ref 24) | Natural England Survey data for the Outer Thames Estuary SPA specifically for the red-throated diver in 2018. |
| British Trust for Ornithology (BTO) (Ref 25) | Source of bird species data. |
| Royal Society for the Protection of Birds (RSPB) (Ref 26) | Source of bird species data. |
| National Biodiversity Network (NBN) (Ref 27) | NBN Atlas Interactive map of sightings for species |
| Lawson et al (2016) (Ref 28) | An assessment of the numbers and distributions of wintering red-throated diver, |

| Source of data | Baseline data |
|---|---|
| | little gull and common scoter in the Greater Wash SPA |
| JNCC (2015) Departmental Brief: Outer Thames Estuary Special Protection Area (Ref 29) | The full overview of the data used to support site identification of the Outer Thames Estuary SPA along with information on confidence in the occurrence and abundance of little tern and common tern. |
| JNCC (2010) Departmental Brief: Outer Thames Estuary Special Protection Area (Ref 30) | The full overview of the data used to support site identification of the Outer Thames Estuary SPA along with information on confidence in the occurrence and abundance of red-throated diver. |
| Scottish Power Renewables (2019) East Anglia ONE Offshore Windfarm environmental Statement Volume 1 Chapter 12 Offshore Ornithology (Ref 282) | The baseline section of the report describes the distribution and abundance of bird species recorded during surveys to the site, including ecology, seasonality and behaviour |
| Scottish Power Renewables (2019) East Anglia TWO Offshore Windfarm environmental Statement Volume 1 Chapter 12 Offshore Ornithology (Ref 31) | The baseline section of the report describes the distribution and abundance of bird species recorded during surveys to the site, including ecology, seasonality and behaviour |
| Macarthur Green (2019) Norfolk Boreas Offshore Wind Farm Environmental Statement Chapter 13 Offshore Ornithology (Ref 32) | The baseline section of the report describes the distribution and abundance of bird species recorded during surveys to the site, including flight characteristics, ecology, seasonality and behaviour. |
| Macarthur Green (2018) Norfolk Vanguard Offshore Wind Farm Environmental Statement Chapter 13 Offshore Ornithology (Ref 33) | The baseline section of the report describes the distribution and abundance of bird species recorded during surveys to the site, including flight characteristics, ecology, seasonality and behaviour. |
| BTO Wetland Bird Survey (WeBS) (Ref 34) | The Wetland Bird Survey (WeBS) is the monitoring scheme for non-breeding waterbirds in the UK. Survey information from Minsmere survey 2022/23 and Benacre 2019/20. |
| European Seabirds at Sea Survey Data (Ref 35) | European Seabirds At Sea (ESAS) assembles offshore monitoring data on seabirds and marine mammals. This international database mostly includes data from the North Sea. |
| Five Estuaries Offshore Windfarm Ltd Environmental Statements and/or appendices with ornithology survey results. (Ref 36) | Data from the consent application has been analysed to inform the baseline description |
| The International Convention for the Conservation of Nature (IUCN) | Extinction risk status of protected species Red List of Threatened Species (https://www.iucnredlist.org/ ) |

### Site surveys

21.4.27 The following surveys were proposed in the EIA Scoping Report and were undertaken following agreement with Natural England on the approach. Full methodology of these surveys are included in **Chapter 8 Ecology and Biodiversity**, **Appendix 8.12 Baseline Report – Wintering Bird Survey 2022 – 2023, Appendix 8.13 Baseline Report – Wintering Bird Survey 2023 - 2024** and **Appendix 8.15 Baseline Report – Inshore and Beach Breeding Bird Survey 2024** of this PEIR.

21.4.28 Vantage point (VP) surveys were undertaken at the proposed Landfall by experienced ornithologists using appropriate optics (binoculars and telescopes) focussed on a 2km 180° view arc looking out to sea.

21.4.29 The observations for the VP surveys for the breeding season were undertaken from April to September 2024, and for the non-breeding season from October 2023 to March 2024.

21.4.30 In addition, beach surveys were undertaken 1km either side of the VP location to identify the presence of target species which may breed or roost/loaf on the beach and associated structures. The beach surveys were undertaken at the same frequency as the VP surveys.

21.4.31 The following bird survey reports of this PEIR were used to inform the intertidal and offshore ornithology assessment:

a. **Appendix 8.13 Baseline Report – Wintering Bird Survey Report 2023-2024**;
b. **Appendix 8.15 Baseline Report – Inshore and Beach Breeding Survey Report 2024**

### Assessment methodology

21.4.32 The approach to assessment is set out in **Chapter 5 EIA Approach and Methodology** of this PEIR. This has informed the approach used in this intertidal and offshore ornithology assessment.

21.4.33 The assessment criteria that was proposed within the EIA Scoping Report has been changed in light of comments received from the Planning Inspectorate PINS. The assessment criteria as presented in this chapter has been agreed with Natural England, JNCC and the MMO in June 2025.

21.4.34 Following consultation in regard concerns about the Outer Thames Estuary SPA with Natural England in June 2025 a red-throated diver displacement technical note is being prepared. This will be available to inform the ES.

21.4.35 The criteria for characterising the value and sensitivity and magnitude for intertidal and offshore ornithology are outlined in **Table 21.9** and **Table 21.10**.

21.4.36 The assessment of sensitivity has been made with consideration of the rarity and importance of the receptor but has primarily focused on the vulnerability of the receptor to an impact and its ability to recover and adapt. Vulnerability can differ

between different functional groups of marine birds and will also vary depending on the impact pathway and season. For example, certain species of diver (e.g., red-throated diver) and seaduck (e.g., common scoter) are more sensitive to visual disturbance than terns and gulls, whilst sensitivity to temporary changes in suspended sediment concentrations typically only affects species which plunge dive for prey (e.g., red-throated diver, tern species), with species such as waders not considered sensitive.

21.4.37 It should be noted though, that a species may be of international importance (e.g., a designated feature of an SPA) and initially categorised as 'highly' sensitive according to **Table 21.9**. However, if baseline studies and species characteristics show that the species is only rarely or occasionally present in the Draft Order Limits, or if it is not sensitive to the impact pathway, professional judgement may justify lowering its sensitivity category. Where such assessments have been made, justification has been provided. This is particularly relevant if a marine activity is taking place during a specific season, when it is known that the species would not be present. However, a precautionary approach has been taken throughout.

21.4.38 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 foraging and loafing which the species may be unwilling or unable to move away from are considered.

21.4.39 The impact assessment will use available evidence, professional judgement and knowledge of bird ecology and behaviour to determine the level of impact.

**Table 21.9: Criteria for characterising the sensitivity of receptors**

| Sensitivity | Description of criteria |
|---|---|
| High | Receptor is of very high or high importance and rarity, international or national scale (i.e., a designated feature of an SPA, Ramsar or Marine Conservation Zone (MCZ), priority species).<br>Receptor has low tolerance to change i.e., recovery will take longer than 10 years following the cessation of activity or will not occur.<br>The licensable activity is taking place during a sensitive season. |
| Medium | Receptor is of medium importance and rarity, regional scale (i.e., a designated feature of a SSSI or NNR).<br>Receptor has intermediate tolerance to change i.e., recovery to pre-impact conditions is possible between 5 and 10 years. |
| Low | Receptor is of low importance and rarity, local scale.<br>Receptor has high tolerance to change with recovery to pre-impact conditions between 1 and 5 years. |
| Negligible | Receptor is common or widespread. |

| Sensitivity | Description of criteria |
|---|---|
| | The receptor is tolerant to change with no effect on its character. Recovery expected to be relatively rapid, i.e., less than approximately 1 year following cessation of activity. |

### Table 21.10: Criteria for characterising the magnitude of an impact

| Magnitude | Description of criteria |
|---|---|
| High | Major disturbance over multiple seasons such that population can no longer use key nesting/foraging/loafing grounds and recruitment declines above that which would be expected from natural fluctuations.<br>A change in the size or extent of distribution of the population that is the interest feature of a specific designated site such that the viability of the population and/or the integrity of the designated site is predicted to be irreversibly altered in the short-to-long term. Recovery from that change would be predicted to be achieved in the long-term (i.e., more than five years) through to permanent duration following cessation of the development activity. |
| Medium | Significant disturbance over the whole season for a sensitive species such that they are displaced from preferred nesting/foraging/loafing areas, with limited alternatives.<br>A change in the size or extent of distribution of the population that is the interest feature of a specific designated site that is expected to occur in the short and long-term, but which is not expected to alter the long-term viability of the population and/or the integrity of the designated site. Recovery from that change predicted to be achieved in the medium-term (i.e., no more than five years) following cessation of the development activity. |
| Low | Disturbance is temporary (less than a season), site specific and/or a minor shift away from the baseline condition such as that experienced under natural conditions. Impacts limited to within the project's footprint.<br>A change in the size or extent of distribution of the population that is the interest feature of a specific designated site that is expected to occur at a sufficiently small scale or of a short duration such that no long-term harm to the viability of the population or the integrity of the designated site is expected. Recovery from that change is predicted to be achieved in the short-term (i.e., no more than one year) following cessation of the development activity. |
| Negligible | Very little or no detectable change from baseline conditions. Disturbance is within the range of natural variability. Impacts predicted to be brief (one to two days) or for a short period but outside of the key season (up to 3 months).<br>Any change is predicted to be reversible and recovery from any change is predicted to be rapid (i.e., no more than approximately 6 months) following cessation of the development activity. |

**21.4.40** The significance of an effect, either adverse or beneficial, would be determined using a combination of the magnitude of the impact and the sensitivity of the receptor. A matrix approach is used throughout all topic areas to ensure a consistent approach within the assessment. This is described further in **Chapter 5 EIA Approach and Methodology** of this PEIR and is replicated for ease in **Table 21.11.**

**Table 21.11: Significance matrix**

| Magnitude of Impact | Receptor value and sensitivity | | | |
|---|---|---|---|---|
| | **High** | **Medium** | **Low** | **Negligible** |
| **High** | Major | Moderate | Moderate | Minor |
| **Medium** | Moderate | Moderate | Minor | Negligible |
| **Low** | Moderate | Minor | Negligible | Negligible |
| **Negligible** | Minor | Negligible | Negligible | Negligible |

### Cumulative assessment

21.4.41 **Chapter 28 Cumulative Effects** of this PEIR defines the methodology for the assessment of cumulative effects. The intertidal and offshore ornithology assessment of intra- and inter-project cumulative effects will be carried out and reported within the ES to be submitted with the application for development consent.

21.4.42 The zone of influence for the inter-project cumulative effects assessment of intertidal and offshore ornithology comprises the Draft Order Limits of the Proposed Offshore Scheme plus and additional buffer of 15km to either side. This is the same study area as used for the assessment of preliminary environmental effects from the Proposed Offshore Scheme. As outlined in **paragraphs 21.4.5 to 21.4.11** this takes into consideration seabird foraging ranges, recent recommendations from SNCBs and the maximum tidal ellipse and is considered to be sufficiently proportionate and precautionary for the Proposed Offshore Scheme.

### Guidance

21.4.43 In addition, the intertidal and offshore ornithology assessment has been undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The guidance and standards which relate to this assessment are:

a. Habitats regulations assessments: protecting a European site. (Ref 37);

b. Natural England Offshore Wind cabling ten years' experience and recommendations (Ref 38);
c. Natural England Conservation Advice for Marine Protected Areas (Ref 39);
d. JNCC Conservation Advice for Marine Protected Areas (Ref 40);
e. Joint SNCB Interim Displacement Advice Note (2017) (Ref 41);
f. Joint SNCB interim advice on the treatment of displacement for red-throated diver (Ref 42);
g. Natural England's Best Practice Protocol for Vessels in Red-Throated Diver SPAs (Ref 43); and
h. Natural England and JNCC guidance on key sensitivities of habitats and Marine Protected Areas in English waters to aggregate extraction (Ref 44).

## 21.5 Assessment assumptions and limitations

21.5.1 This section provides a description of the assumptions and limitations to the intertidal and offshore ornithology assessment. The information provided in this PEIR is preliminary and the final assessment of significant effects will be reported in the ES.

21.5.2 The PEIR has been produced to fulfil the Applicant's consultation duties in accordance with Section 42 of the Planning Act 2008 (PA2008) and enable consultees to develop an informed view of the likely significant effects of the Proposed Offshore Scheme.

21.5.3 This PEIR has been collated based on a range of publicly available data and project specific survey data. It is assumed that the data collated is accurate. During a meeting with Natural England on 15 November 2023, the Applicant confirmed that no offshore aerial ornithology surveys would be undertaken to support this PEIR chapter, which was agreed by Natural England.

21.5.4 It should be noted that the survey data currently available for the Outer Thames Estuary SPA was published in 2019 (Ref 24). Engagement with Natural England has confirmed that this is the most recent survey data, therefore, this PEIR chapter has been informed by the data set acquired in 2018. It is recognised that the data set is limited as it provides a short 'snapshot' of the populations present within the Outer Thames Estuary SPA during two days in one particular season. To supplement the data, the Applicant has made use of the available data from offshore wind farm projects in the area, as well as information from the JNCC which was used to inform the designation of the Outer Thames Estuary SPA (Ref 21). Whilst the Applicant recognises that the use of data from offshore wind projects would not provide a full 'picture' of seasonal and annual variation in species distribution and density, it will assist in the identification of trends, for example certain hotspots for red-throated diver.

21.5.5 The assessment has been undertaken based on the description of the Proposed Offshore Scheme presented in **Chapter 2 Description of the Proposed Scheme** of this PEIR. To allow flexibility due to changing seabed conditions or features, it is assumed that the Proposed Offshore Scheme could be installed anywhere

within the Draft Order Limits. Whilst indicative locations have been provided for external cable protection for infrastructure crossings, it is also assumed that remedial external cable protection could be used at any point along the Proposed Offshore Scheme and therefore anywhere within the Draft Order Limits.

21.5.6 In the absence of data, a precautionary approach has been taken and professional judgement, based on experience of similar linear schemes, has been used where required to inform the scope of the assessment.

21.5.7 It is assumed that the data available from existing literature, relevant surveys and the proposed assessments will provide an appropriate evidence base for intertidal and offshore ornithology within the study area. It is recognised that there is limited data available on migration routes but given the linear nature of the Proposed Offshore Scheme and the temporary nature of the majority of potential impacts it is not anticipated this limitation would adversely affect the assessment.

## 21.6 Baseline conditions

21.6.1 To provide an assessment of the likely significance of the Proposed Offshore Scheme (in terms of intertidal and offshore ornithology), it is necessary to identify and understand the baseline conditions in the study area. This provides a reference point against which potential changes in intertidal and offshore ornithology can be assessed.

21.6.2 The baseline section should be read in conjunction with the following supporting Appendices and Figures as found within Volume 2 and Volume 3 of this PEIR respectively:

a. **Habitats Regulation Assessment (HRA) Evidence Plan** provided as part of the statutory consultation;
b. **Habitats Regulation Assessment (HRA) Screening Report** provided as part of the statutory consultation;
a. **Figure 21.1 Intertidal and Offshore Ornithology Study Area and Relevant Designated Sites**.
b. **Figure 21.2 LionLink Wintering bird survey 2023/2024 sightings data**
c. **Figure 21.3 LionLink Inshore and beach breeding bird survey 2024 sightings data**
d. **Figure 21.4 European shag spatial variation in predicted densities (individuals/Km²) in January and June**
e. **Figure 21.5 Razorbill spatial variation in predicted densities (individuals/Km²) in January and June**
f. **Figure 21.6 Common guillemot spatial variation in predicted densities (individuals/Km²) in January and June**
g. **Figure 21.7 Herring gull spatial variation in predicted densities (individuals/Km²) in January and June**
h. **Figure 21.8 Kittiwake spatial variation in predicted densities (individuals/Km²) in January and June**

i. **Figure 21.9 Lesser black-backed gull spatial variation in predicted densities (individuals/Km²) in January and June**
j. **Figure 21.10 Red-throated diver spatial variation within the Outer Thames Estuary SPA 2013**
k. **Figure 21.11 Red-throated diver spatial variation within the Outer Thames Estuary SPA 2018**
l. **Figure 21.12 Monthly red-throated diver sitings from LionLink wintering bird survey 2023/24**
m. **Figure 21.13 Red-throated diver bird count 2013 in comparison to vessel density**
n. **Figure 21.14 Red-throated diver bird count 2018 in comparison to vessel density**
o. **Figure 21.15 Worst case scenario vessel transit routes through Outer Thames Estuary SPA**

### Current baseline

21.6.3 Intertidal and offshore ornithology refers to the diversity, abundance and function of marine bird species present in the study area up to MHWS. This includes all life stages including: feeding, breeding, overwintering and migrating. For the baseline of onshore ornithology (landward of MHWS) please refer to **Chapter 8 Ecology and Biodiversity** of this PEIR.

21.6.4 For the purposes of this PEIR, marine birds have been described according to Atterbury et al. (2021) (Ref 44) based on their functional groups, of which there are five:

a. Divers, grebes and mergansers
b. Seaducks, geese and swans
c. Auks
d. Terns, gulls, kittiwakes and gannets
e. Waders and harriers

### Intertidal

21.6.5 The intertidal ecology baseline is described in **Chapter 19 Intertidal and Subtidal Benthic Ecology** of this PEIR and can be summarised as follows: The landfall lies at Walberswick where the foreshore sediments are reflective of coastal dunes and sandy shores. The nearshore area is dominated by littoral fine sand or muddy sand. The nearshore region of the study area is characterised by offshore circalittoral sand.

21.6.6 The proposed Landfall lies within The Wetland Bird Survey (WeBS) site Dingle Marshes and Walberswick National Nature Reserve (Location Code 3310) (Ref 45). The study area also includes the WeBS survey site Minsmere (Location code 33074) (Ref 46) and Benacre Broad (Location code 33082) (Ref 47).

21.6.7 **Table 21.11** shows the results of four bird surveys undertaken within the study area.

21.6.8 The table has the total number of each species identified in the surveys as well as information on whether these are breeding or non-breeding species, if they are a qualifying feature of a nearby designated site and also the months the species are recorded in the UK.

21.6.9 The most prevalent functional group is 'waders' (28 species), with functional group 'seaducks, swans and geese' also highly represented (17 species). Seven species of gull and four species of 'divers, grebes and mergansers' have been noted in the data.

21.6.10 The top five abundant species over the last five years are (in order of abundance) teal (*Anas crecca*), lapwing (*Vanellus vanellus*), black-headed gull (*Chroicocephalus ridibundus*), greylag goose (*Anser anser*) and wigeon (*Anas penelope).* Of the marine birds present black-headed gull and herring gull (*Larus argentatus*) are the most numerous.

21.6.11 The LionLink Inshore and beach breeding bird survey recorded seven species of seaducks, swans and geese, five species of gulls and no waders. Additionally, both red-throated diver and common scoter (*Melanitta nigra*) were recorded. Between 2023-2024, a total count of two red-throated diver and a total count of 3,241 common scoter were recorded.

### Waders and Harriers

21.6.12 This functional group includes waders that breed, migrate, and winter along the UK coast. Wader species employ various foraging strategies but are all surface or near-surface feeders. They utilise open coasts, mudflats, sandflats, saltmarshes, saline lagoons, rocky coasts and nearby grazing marshes and arable lands for feeding and roosting. While some species, like the oystercatcher (*Haematopus ostralegus*), are more dependent on localised food resources such as cockle and mussel beds, others are more generalist in their diet. Certain waders have specific breeding habitat preferences - avocets (*Recurvirostra avosetta*) favour saline lagoons, saltpans, and scrapes, while ringed plovers (*Charadrius hiaticula*) prefer sand, shingle, and saltmarsh edges - though some species use a broader range of coastal and adjacent habitats. This group also includes marsh and hen harriers (*Circus aeruginosus* and *Circus cyaneus*), both of which make extensive use of intertidal habitats for foraging and roosting during the winter. Marsh harriers also breed in coastal habitats, particularly saline reedbeds, during the breeding season.

21.6.13 These species are sensitive to visual and noise disturbances from vessel traffic. Waders and other species using intertidal habitats are particularly vulnerable to disturbances caused by people and machinery operating within or near their habitats. Generally, shipping poses a lower risk to these habitats except where shallow-draft vessels are employed. Activities that disturb intertidal habitats or prey species can reduce the availability of suitable prey, potentially impacting these species' feeding opportunities

21.6.14 Digital aerial bird surveys from the Outer Thames Estuary SPA undertaken in 2018 (Ref 24) and European Seabirds at Sea survey data (Ref 48), as well as the sightings data from the LionLink wintering bird survey undertaken in 2023-2024 and inshore and beach breeding bird survey in 2024 recorded the following marine birds from this functional group.

a. Black-tailed godwit
b. Moorhen
c. Curlew
d. Oystercatcher
e. Dunlin
f. Peregrine
g. Great white egret
h. Red kite
i. Green sandpiper
j. Redshank
k. Grey heron
l. Sanderling
m. Grey plover
n. Snipe
o. Jack snipe
p. Spotted redshank
q. Lapwing
r. Turnstone
s. Little egret
t. Water rail
u. Marsh harrier
v. Woodcock

21.6.15 **Table 21.12** shows data for intertidal sightings and includes sightings data from four sources.

a. The LionLink Inshore and beach breeding bird survey undertaken in 2023/24 is illustrated in **Figure 21.3.**
b. WeBS survey data for Minsmere from 2022/2023 (Ref 49),
c. WeBS survey data for Benacre from 2019/2020 (Ref 50)
d. WeBS survey data Dingle Marshes and Walberswick National Nature 2023/24 (Ref 48)

## Table 21.12: Intertidal sightings and seasonal data within the study area

| | Annex I Species | | Non-Annex I Species |
|---|---|---|---|

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| **DSG - Divers, grebes and mergansers** | | | | | | | | | | | | | | | | | | | | | | | |
| Cormorant (Ref 52, Ref 53) | Breeding & non-breeding | | 1.5% of world population | 5 | 201 | 5 | 7 | | | | | | | | | | | | | | | | |
| Great crested grebe (Ref 54, Ref 55) | Breeding & non-breeding | | | | 25 | 4 | | | | | | | | | | | | | | | | | |
| Little grebe (Ref 58, Ref 59) | Breeding & non-breeding | | | 3 | 2 | | | | | | | | | | | | | | | | | | |
| Red-throated diver (Ref 62, Ref 63) | Non-breeding | Outer Thames Estuary SPA | OTE 38% GB population | | 20 | | 2 | | | | | | | | | | | | | | | | |
| **SGS – Seaducks, geese and swans** | | | | | | | | | | | | | | | | | | | | | | | |
| Barnacle goose (Ref 68, Ref 69) | Non-breeding | | | | 82 | | | | | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Brent goose (Ref 72) | Non-breeding | | | | 2 | | | | | | | | | | | | | | |
| Canada goose (Ref 73, Ref 74) | Breeding & non-breeding | | | | 31 | | | | | | | | | | | | | | |
| Common scoter (Ref 75, Ref 76) | Non-breeding | | | | | | 3241 | | | | | | | | | | | | |
| Eider (*Somateria mollissima)* (Ref 195, Ref 196) | Breeding & non-breeding | | | | | | 2 | | | | | | | | | | | | |
| Egyptian goose (Ref 77, Ref 78) | Breeding & non-breeding | | | | 2 | | | | | | | | | | | | | | |
| Gadwall (Ref 79, Ref 80) | Breeding & non-breeding | Minsmere – Walberswick SPA and Ramsar Broadland Ramsar | | 30 | 213 | | | | | | | | | | | | | | |
| Goldeneye (Ref 81, Ref 82) | Non-breeding | | | | 1 | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Goosander (*Mergus merganser*) (Ref 197, Ref 198) | Breeding & non-breeding | | | | 5 | | | | | | | | | | | | | | |
| Greylag goose (Ref 85, Ref 86) | Breeding & non-breeding | Broadland Ramsar | | 90 | 318 | 21 | | | | | | | | | | | | | |
| Mallard (*Anas platyrhynchos*) (Ref 89, Ref 90) | Breeding & non-breeding | | | 139 | | | | | | | | | | | | | | | |
| Mute swan (Ref 91, Ref 92) | Breeding & non-breeding | | | 9 | 23 | | 2 | | | | | | | | | | | | |
| Pintail (Ref 95, Ref 96) | Non-breeding | | | | | 1 | | | | | | | | | | | | | |
| Pochard (Ref 97, Ref 98) | Non-breeding | | | | 1 | | | | | | | | | | | | | | |
| Shelduck (Ref 100) | Non-breeding | | | 16 | 99 | 2 | | | | | | | | | | | | | |
| Shoveler (Ref 101) | Breeding & non-breeding | Minsmere – Walberswick SPA and Ramsar | | 10 | 159 | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| | | Broadland Ramsar | | | | | | | | | | | | | | | | | |
| Surf scoter (*Melanitta perspicillata*) (Ref 199) | Non-breeding | | | | | | 1 | | | | | | | | | | | | |
| Teal (Ref 102) | Breeding | Minsmere – Walberswick SPA and Ramsar | | 231 | 892 | 12 | 10 | | | | | | | | | | | | |
| Tufted duck (Ref 103, Ref 104) | Breeding & non-breeding | | | | 11 | | 3 | | | | | | | | | | | | |
| Whooper swan (*Cygnus cygnus*) (Ref 200, Ref 201) | Non-breeding | | | | 1 | | 2 | | | | | | | | | | | | |
| Wigeon (Ref 107) | Non-breeding | Broadland SPA | | 32 | 375 | | | | | | | | | | | | | | |
| **Auks** | | | | | | | | | | | | | | | | | | | |
| Guillemot (Ref 108, Ref 109) | Breeding & non-breeding | | N Atlantic – 33.3% Biogeograp | | 5 | | 5 | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| | | | hic population | | | | | | | | | | | | | | | | |
| **TGKG - Terns, gulls, kittiwakes and gannets** | | | | | | | | | | | | | | | | | | | |
| Arctic tern (Ref 119, Ref 120) | Breeding | | Europe and N Atlantic – 4.6% Biogeographic population | | | 1 | | | | | | | | | | | | | |
| Black-headed gull (Ref 121, Ref 122) | Breeding & non-breeding | | UK – 1.3% Biogeographic population | 22 | 1207 | | 26 | | | | | | | | | | | | |
| Caspian gull (Ref 123) | Non-breeding | | | | 1 | | | | | | | | | | | | | | |
| Common gull (Ref 124, Ref 125) | Breeding & non-breeding | | UK – 8.9% Biogeographic population | | 179 | | 41 | | | | | | | | | | | | |
| Common tern (Ref 126, Ref 127) | Breeding & non-breeding | Outer Thames Estuary SPA | OTE 2.66% of GB population | | 245 | 80 | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Fulmar (Ref 128, Ref 129) | Breeding & non-breeding | | UK – 14.8% Biogeographic population | | 40 | | | | | | | | | | | | | | |
| Gannet (Ref 130, Ref 131) | Breeding & non-breeding | | 55.6% of world population | | 42 | | | | | | | | | | | | | | |
| Great black-backed gull (Ref 132, Ref 133) | Breeding & non-breeding | | 9.6% of world population | 1 | 132 | | 63 | | | | | | | | | | | | |
| Great skua (Ref 134, Ref 135) | Non-breeding | | 60% of world population | | 2 | | | | | | | | | | | | | | |
| Herring gull (Ref 136, Ref 137) | Breeding & non-breeding | | 12.1% of world population | 4 | 34 | | 751 | | | | | | | | | | | | |
| Kittiwake (Ref 138, Ref 139) | Breeding & non-breeding | | UK – 16.2% Biogeographic population | | 55 | | 1 | | | | | | | | | | | | |
| Lesser black-backed gull (Ref 140, Ref 141) | Breeding & non-breeding | Alde-Ore Estuary Ramsar | 38.4% of world population | 1 | 28 | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Little gull (Ref 142, Ref 143) | Non-breeding | | | | 25 | 16 | 311 | | | | ■ | ■ | ■ | ■ | ■ | | | | |
| Little tern (Ref 144, Ref 145, Ref 146) | Breeding | Outer Thames Estuary SPA Benacre to Easton Bavents SPA Minsmere – Walberswick SPA | OTE 19.6% GB population | | | 28 | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| Mediterranean gull (Ref 147) | Breeding & non-breeding | | 0.1% world population | | 67 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Sandwich tern (Ref 148, Ref 149, Ref 150) | Breeding | Alde-Ore Estuary SPA Greater Wash SPA | UK – 21.7% Biogeographic population | | 128 | 6 | | | | | ■ | ■ | ■ | ■ | ■ | | | | |
| Yellow legged gull (Ref 151, Ref 152) | Non-breeding | | | | 1 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| **WH – Waders and Harriers** | | | | | | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Avocet (Ref 153, Ref 154) | Breeding & non-breeding | Minsmere-Walberswick SPA Alde-Ore Estuary Ramsar | | | 234 | 72 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Bar-tailed godwit (*Limosa lapponica*) (Ref 202, Ref 203) | Non-breeding | | | | 22 | 1 | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ |
| Bittern (*Botaurus stellaris*) (Ref 204, Ref 205) | Breeding | Minsmere – Walberswick SPA Broadland SPA Benacre to Easton Bavents SPA | | 1 | 2 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Black-tailed godwit (Ref 155, Ref 156) | Non-breeding | | | | 32 | 30 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Common sandpiper (*Actitis hypoleucos*) (Ref 206, Ref 207) | Breeding & non-breeding | | | | 2 | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Coot (*Fulica atra*) (Ref 208, Ref 209) | Breeding & non-breeding | | | | 41 | | | | | | | | | | | | | | |
| Curlew (Ref 157) | Non-breeding | | | 4 | 2 | 1 | | | | | | | | | | | | | |
| Dunlin (Ref 158, Ref 159) | Breeding & non-breeding | | | 5 | 15 | 12 | | | | | | | | | | | | | |
| Greenshank (*Tringa nebularia*) (Ref 210, Ref 211) | Breeding & non-breeding | | | | 3 | 4 | | | | | | | | | | | | | |
| Green sandpiper (Ref 162, Ref 163) | Non-breeding | | | | 4 | | | | | | | | | | | | | | |
| Grey heron (Ref 164, Ref 165) | Breeding & non-breeding | | | 6 | 6 | 2 | | | | | | | | | | | | | |
| Grey plover (Ref 166) | Non-breeding | | | | 1 | | | | | | | | | | | | | | |
| Great white egret (*Egretta garzetta*) (Ref 212, Ref 213) | Non-breeding | | | 3 | 3 | | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Jack Snipe (*Lymnocryptes minimus*) (Ref 167, Ref 168) | Non-breeding | | | 2 | | | | | | | | | | | | | | | |
| Knot (*Calidris canutus*) (Ref 214, Ref 215) | Non-breeding | | | | 1 | 4 | | | | | | | | | | | | | |
| Lapwing (Ref 169, Ref 170) | Breeding | | | 133 | 1016 | 82 | | | | | | | | | | | | | |
| Little egret (Ref 171, Ref 172) | Breeding & non-breeding | | | 6 | | 14 | | | | | | | | | | | | | |
| Little ringed plover (*Charadrius dubius*) (Ref 216, Ref 217) | Breeding | | | | 2 | | | | | | | | | | | | | | |
| Moorhen (Ref 175, Ref 176) | Breeding & non-breeding | | | | 10 | | | | | | | | | | | | | | |
| Oystercatcher (Ref 177, Ref 178) | Non-breeding | | | 3 | 13 | 4 | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Redshank (Ref 183) | Non-breeding | Alde-Ore Estuary SPA and Ramsar | | 21 | 22 | 1 | | | | | | | | | | | | | |
| Ringed plover (*Charadrius hiaticula*) (Ref 218, Ref 219) | Breeding & non-breeding | | | 2 | 4 | 3 | | | | | | | | | | | | | |
| Ruff (*Philomachus pugnax*) (Ref 220, Ref 221) | Non-breeding | Alde-Ore Estuary SPA and Ramsar Broadland SPA | | | 6 | | | | | | | | | | | | | | |
| Snipe (Ref 185, Ref 186) | Breeding & non-breeding | | | 105 | 17 | | | | | | | | | | | | | | |
| Spoonbill (*Platalea leucorodia*) (Ref 222, Ref 223) | Breeding & non-breeding | | | | 3 | | | | | | | | | | | | | | |
| Spotted redshank (Ref 187, Ref 188) | Non-breeding | | | 2 | 2 | | | | | | | | | | | | | | |
| Turnstone (Ref 189, Ref 190) | Non-breeding | | | | 5 | 1 | | | | | | | | | | | | | |

| Bird Species | Breeding / Non-breeding | Designated site | Estimated Population | Surveys – Total counts of birds observed during survey period | | | | Months when recorded in UK Waters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WeBS Dingle Marshes and Walberswick NNR 2023-2024 | WeBS Minsmere 2022/23* | WeBS Benacre 2019-2020+ | LionLink Inshore and beach breeding bird survey 2023-2024 | J | F | M | A | M | J | J | A | S | O | N | D |
| Water rail (*Rallus aquaticus*) (Ref 191, Ref 192) | Breeding | | | 1 | | | | | | | | | | | | | | | |

Sources: WeBS Dingle Marshes and Walberswick NNR (Ref 45 ) *WeBs Minsmere (Ref 46 ) + WeBS Benacre Broad (Ref 47)

### Marine birds

21.6.16 Marine birds are highly mobile but can be constrained during certain times of the year by factors such as their need to return to a colony to feed and care for chicks, or when they are flightless during a post-breeding moult. Species can also be restricted by their foraging strategy and the availability of prey species and their sensitivity to human activities such as vessel traffic.

21.6.17 The recent Offshore Energy Strategic Environmental Assessment (OESEA) 4 (Ref 22) discusses aspects of the UK baseline environment to facilitate discussion around the potential for future development of renewable energy and oil and gas abstraction. It characterises the UK bird fauna as 'western Palaearctic', meaning that the majority of species are found across western Europe and extend into western Asia and northern Africa. The Proposed Offshore Scheme traverses through the southern North Sea and the adjacent coastline and provides habitats (both breeding and foraging areas) for a wide range of both nationally and internationally recognised marine bird populations. The distribution and abundance of these bird populations fluctuates throughout the year depending on factors such as food availability and seasonality for periods such as breeding.

21.6.18 To further inform this chapter various data sources have been used to produce **Table 21.12** and **Table 21.13**. The tables include seasonal information for species recorded within UK waters and whether they are breeding or non-breeding. It also includes, where available, the estimated population of the species and notes if they are a qualifying feature of a designated site within the study area.

21.6.19 Please note that the figure of species recorded is a total throughout the whole survey period.

21.6.20 **Table 21.13** shows data for offshore sightings and includes sightings data from three sources.

a. The LionLink wintering bird survey undertaken in 2023/2024. **Figure 21.2** of this PEIR illustrates the locations of the sightings.
b. Natural England's digital aerial bird surveys in the Outer Thames Estuary SPA in 2018 (Ref 24) and
c. The European Seabirds at Seas Survey Data from 2010 (Ref 48).

## Table 21.13: Offshore sightings and seasonal data within the study area

| Key | Annex I Species | | Non-Annex I Species | |
|---|---|---|---|---|

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| **DSG - Divers, grebes and mergansers** | | | | | | | | | | | | | | | | | | |
| Black-throated diver (*Gavia arctica*) (Ref 51,Ref 52) | Non-breeding | - | - | - | 3 | 33 | | | | | | | | | | | | |
| Cormorant (*Phalacrocorax carbo*) (Ref 53,Ref 54) | Breeding and non-breeding | 1.5% of world population | - | 42 | - | 301 | | | | | | | | | | | | |
| Great crested grebe (*Podiceps cristatus*) (Ref 55, Ref 56) | Breeding and non-breeding | - | - | 52 | - | 197 | | | | | | | | | | | | |
| Great northern diver (*Gavia immer*) (Ref 57, Ref 58) | Non-breeding | - | - | - | - | 37 | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Little grebe (*Tachybaptus ruficollis*) (Ref 59, Ref 60) | Breeding and non-breeding | - | - | 15 | - | - | | | | | | | | | | | | |
| Red-breasted merganser (*Mergus serrator*) (Ref 61, Ref 62) | Breeding and non-breeding | - | - | - | - | 9 | | | | | | | | | | | | |
| Red-throated diver (*Gavia stellata*) (Ref 63, Ref 64) | Non-breeding | Outer Thames Estuary (OTE) 38% GB population | Outer Thames Estuary SPA (Ref 68) | 160 | - | 4248 | | | | | | | | | | | | |
| Shag (*Phalacrocorax aristotelis*) (Ref 66, Ref 67) | Breeding and non-breeding | 34.1% of world population | - | - | - | 28 | | | | | | | | | | | | |
| Slavonian Grebe (Podiceps auritus) (Ref 68) | Breeding and non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| **SGS - Seaducks, geese and swans** | | | | | | | | | | | | | | | | | | |
| Barnacle Goose *(Branta* | Non-breeding | - | - | 926 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| *leucopsis) (Ref 69, Ref 70)* | | | | | | | | | | | | | | | | | | |
| Bewick's swan (*Cygnus columbianus bewickii*);(Ref 71, Ref 72) | Non-breeding | - | Broadland Ramsar | - | - | - | | | | | | | | | | | | |
| Brent Goose (*Branta bernicla*) (Ref 73) | Non-breeding | - | - | 8 | - | - | | | | | | | | | | | | |
| Canada Goose (*Branta canadensis*) (Ref 74, Ref 75) | Breeding and non-breeding | - | - | 6 | - | - | | | | | | | | | | | | |
| Common scoter (*Melanitta nigra*) (Ref 76, Ref 77) | Non-breeding | - | - | 3118 | - | - | | | | | | | | | | | | |
| Egyptian Goose (*Alopochen aegyptiaca*) (Ref 78, Ref 79) | Breeding and non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Gadwall (*Anas strepera*) (Ref 80, Ref 81) | Breeding and non-breeding | - | Minsmere – Walberswick SPA and Ramsar Broadland Ramsar | 224 | - | - | | | | | | | | | | | | |
| Goldeneye (*Bucephala clangula*) (Ref 82, Ref 83) | Non-breeding | - | - | 2 | - | - | | | | | | | | | | | | |
| Greater white-fronted geese (*Anser albifrons*); (Ref 84, Ref 85) | Non-breeding | - | Minsmere – Walberswick SPA | - | - | - | | | | | | | | | | | | |
| Greylag goose (*Anser anser*) (Ref 86, Ref 87) | Breeding and non-breeding | - | Broadland Ramsar | 22 | - | 5 | | | | | | | | | | | | |
| Long tailed duck (*Clangula hyemalis*) (Ref 88, Ref 89) | Non-breeding | - | - | 4 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Mallard (*Anas platyrhynchos*) (Ref 90, Ref 91) | Breeding and non-breeding | - | - | 426 | - | - | | | | | | | | | | | | |
| Mute Swan (*Cygnus olor*) (Ref 92, Ref 93) | Breeding and non-breeding | - | - | 50 | - | - | | | | | | | | | | | | |
| Pink-footed goose (*Anser brachyrhynchus*) (Ref 94, Ref 95) | Non-breeding | - | Broadland Ramsar | - | - | - | | | | | | | | | | | | |
| Pintail (*Anas acuta*) (Ref 96, Ref 97) | Non-breeding | - | - | 41 | - | - | | | | | | | | | | | | |
| Pochard (*Aythya farina*) (Ref 98, Ref 99) | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| Scaup (*Aythya marila*) (Ref 100) | Non-breeding | - | - | - | - | 11 | | | | | | | | | | | | |
| Shelduck *(Tadorna tadorna)* (Ref 101) | Non-breeding | - | - | 38 | - | 12 | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Shoveler (*Spatula clypeata*) (Ref 102) | Breeding and non-breeding | - | Minsmere – Walberswick SPA and Ramsar Broadland Ramsar | 350 | - | - | | | | | | | | | | | | |
| Teal (*Anas crecca*) (Ref 103) | Non-breeding | - | Minsmere – Walberswick SPA and Ramsar | 474 | - | - | | | | | | | | | | | | |
| Tufted duck (*Aythya fuligula*) (Ref 104, Ref 105) | Breeding and non-breeding | - | - | 54 | - | - | | | | | | | | | | | | |
| Velvet scoter (*Melanitta fusca*) (Ref 106, Ref 107) | Non-breeding | - | - | 5 | - | - | | | | | | | | | | | | |
| Wigeon (*Anas penelope*) (Ref 108) | Non-breeding | - | Broadland Ramsar | 145 | - | 30 | | | | | | | | | | | | |
| **Auks** | | | | | | | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Guillemot (*Uria aalge*) (Ref 109, Ref 110) | Breeding and non-breeding | N Atlantic – 33.3% Biogeographic population | - | 1 | - | 388 | | | | | | | | | | | | |
| Atlantic puffin (*Fratercula arctica*) (Ref 111, Ref 112, Ref 113) | Breeding and non-breeding | 9.6% of world population | - | - | - | - | | | | | | | | | | | | |
| Little auk (*Alle alle*) (Ref 114, Ref 115) | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| Razorbill (*Alca torda*) (Ref 116, Ref 117) | Breeding and non-breeding | 20.2% of world population | - | - | - | 48 | | | | | | | | | | | | |
| **TGKG - Terns, gulls, kittiwakes and gannets** | | | | | | | | | | | | | | | | | | |
| Arctic skua (*Stercorarius parasiticus*) (Ref 118, Ref 119) | Non-breeding | NE Atlantic – 8.4 % Biogeographic population | - | - | 2 | - | | | | | | | | | | | | |
| Arctic tern (*Sterna paradisaea*) (Ref 120, Ref 121) | Breeding | Europe and N Atlantic – 4.6% | - | - | 3 | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| | | Biogeographic population | | | | | | | | | | | | | | | | |
| Black-headed gull (*Larus ridibundus*) (Ref 122, Ref 123) | Breeding and non-breeding | UK – 1.3% Biogeographic population | - | 4835 | - | 966 | | | | | | | | | | | | |
| Caspian gull (*Larus cachinnans*) (Ref 124) | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| Common gull (*Larus canus*) (Ref 125, Ref 126) | Breeding and non-breeding | UK – 8.9% Biogeographic population | - | 1628 | 8 | 2417 | | | | | | | | | | | | |
| Common tern (*Sterna hirundo*) (Ref 127, Ref 128) | Breeding and non-breeding | OTE 2.66% of GB population | Outer Thames Estuary SPA | - | 40 | - | | | | | | | | | | | | |
| Fulmar (*Fulmarus glacialis*) (Ref 129, Ref 130) | Breeding and non-breeding | UK – 14.8% Biogeographic population | - | - | 42 | 34 | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Gannet (*Morus bassanus*) (Ref 131, Ref 132) | Breeding and non-breeding | 55.6% of world population | - | - | - | 254 | | | | | | | | | | | | |
| Great black-backed gull (*Larus marinus*) (Ref 133, Ref 134) | Breeding and non-breeding | 9.6% of world population | - | 124 | 2 | 564 | | | | | | | | | | | | |
| Great skua (*Stercorarius skua*) (Ref 135, Ref 136) | Non-breeding | 60% of world population | - | - | - | 1 | | | | | | | | | | | | |
| Herring gull (*Larus argentatus*) (Ref 137, Ref 138) | Breeding and non-breeding | 12.1% of world population | - | 1825 | 16 | 750 | | | | | | | | | | | | |
| Kittiwake (*Rissa tridactyla*) (Ref 139, Ref 140) | Breeding and non-breeding | UK – 16.2% Biogeographic population | - | 1 | 18 | 656 | | | | | | | | | | | | |
| Lesser black-backed gull (*Larus fuscus*) (Ref 141, Ref 142) | Breeding and non-breeding | 38.4% of world population | Alde-Ore Estuary Ramsar | 127 | - | 143 | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Little gull (*Hydrocoloeus (Larus) minutus*) (Ref 143, Ref 144) | Non-breeding | - | - | - | - | 3 | | | | | | | | | | | | |
| Little tern (*Sterna albifrons*) (Ref 145, Ref 146, Ref 147) | Breeding | OTE 19.6% GB population | Outer Thames Estuary SPA Benacre to Easton Bavents SPA | - | - | - | | | | | | | | | | | | |
| Mediterranean gull (*Larus melanocephalus*) (Ref 148) | Breeding and non-breeding | 0.1% world population | - | 5 | - | 3 | | | | | | | | | | | | |
| Sandwich tern (*Thalasseus sandvicensis*) (Ref 149, Ref 150, Ref 151) | Breeding | UK – 21.7% Biogeographic population | Alde-Ore Estuary SPA Greater Wash SPA | - | - | - | | | | | | | | | | | | |
| Yellow backed gull (*Larus michahellis*) (Ref 152, Ref 153) | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| **WH – Waders and harriers** | | | | | | | | | | | | | | | | | | |
| Avocet (*Recurvirostra avosetta*) (Ref 154, Ref 155) | Breeding and non-breeding | - | Minsmere – Walberswick SPA Alde-Ore Estuary Ramsar | - | - | - | | | | | | | | | | | | |
| Black-tailed Godwit (*Limosa limosa*) (Ref 156, Ref 157) | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| Curlew (*Numenius arquata*) (Ref 158) | Non-breeding | - | - | 678 | - | 8 | | | | | | | | | | | | |
| Dunlin (*Calidris alpina)* (Ref 159, Ref 161) | Breeding and non-breeding | - | - | 5 | - | - | | | | | | | | | | | | |
| Great White Egret (*Ardea alba*) (Ref 162) | Non-breeding | - | - | 52 | - | - | | | | | | | | | | | | |
| Green sandpiper (*Tringa* | Non-breeding | - | - | 2 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| *ochropus*) (Ref 163, Ref 164) | | | | | | | | | | | | | | | | | | |
| Grey heron (*Ardea cinerea*) (Ref 165, Ref 166) | Breeding and non-breeding | - | - | 18 | - | - | | | | | | | | | | | | |
| Lapwing (*Vanellus vanellus)* (Ref 170, Ref 171) | Breeding | - | - | 1784 | - | 19 | | | | | | | | | | | | |
| Little egret (*Egretta garzetta*) (Ref 172, Ref 173) | Breeding and non-breeding | - | - | 18 | - | - | | | | | | | | | | | | |
| Marsh harrier (*Circus aeruginosus*) (Ref 174, Ref 175) | Breeding | - | - | 10 | - | - | | | | | | | | | | | | |
| Moorhen (*Gallinula chloropus*) (Ref 176, Ref 177) | Breeding and non-breeding | - | - | 2 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| Oystercatcher (*Haematopus ostralegus)* (Ref 178, Ref 179) | Non-breeding | - | - | 12 | - | 110 | | | | | | | | | | | | |
| Peregrine (*Falco peregrinus*) (Ref 180, Ref 181) | Breeding | - | - | 1 | - | - | | | | | | | | | | | | |
| Red kite (*Milvus milvus*) (Ref 182, Ref 183) | Breeding | - | - | 2 | - | - | | | | | | | | | | | | |
| Redshank (*Tringa totanus)* (Ref 184) | Non-breeding | - | Alde-Ore Estuary Ramsar | 34 | - | 56 | | | | | | | | | | | | |
| Sanderling (*Calidris alba*) (Ref 185) | Non-breeding | - | - | - | - | 44 | | | | | | | | | | | | |
| Snipe (*Gallinago gallinago*)(Ref 186, Ref 187) | Breeding and non-breeding | - | - | 15 | - | - | | | | | | | | | | | | |
| Spotted redshank (*Tringa* | Non-breeding | - | - | 1 | - | - | | | | | | | | | | | | |

| Bird Species | Breeding/Non-breeding | Estimated Population | Designated site | Surveys (Total Count during survey period) | | | Months when recorded in the UK | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LionLink Wintering | ESAS - JNCC + | Outer Thames Estuary SPA* (data from within SPA only) | J | F | M | A | M | J | J | A | S | O | N | D |
| *erythropus*) (Ref 188, Ref 189) | | | | | | | | | | | | | | | | | | |
| Turnstone (Arenaria interpres) (Ref 190, Ref 191) | Non-breeding | - | - | 22 | - | - | | | | | | | | | | | | |
| Water rail (*Rallus aquaticus*) (Ref 192, Ref 193) | Breeding | - | - | 17 | - | - | | | | | | | | | | | | |
| Woodcock (*Scolopax rusticola*) (Ref 194, Ref 195) | Breeding and non-breeding | - | - | 2 | - | - | | | | | | | | | | | | |

Sources: +ESAS-JNCC (Ref 48) *NE Outer Thames Estuary SPA digital aerial survey 2018 (Ref 24)

### Divers, grebes and mergansers

21.6.21 This functional group are highly sensitive to noise and visual disturbance, such as those caused by vessel traffic (Ref 225) (Ref 44). Some species, including red-throated diver, may not resettle quickly after being flushed, effectively losing the vessel transit route and a buffer zone of several kilometres as habitat (Ref 226) (Ref 44). Additionally, these species are thought to be sensitive to both underwater noise and increased suspended sediment concentrations when foraging in the water column.

21.6.22 These species typically gather in coastal waters, including bays and estuaries, often forming large aggregations in some areas during winter. During the breeding season, their foraging activity is generally confined to restricted ranges near breeding sites. Post-breeding, many species undergo a flightless moulting period, during which they may be especially vulnerable to anthropogenic impacts. While primarily considered water column feeders, some evidence suggests that certain species may also feed on benthic prey (Ref 227) (Ref 44).

21.6.23 Digital aerial bird surveys from the Outer Thames Estuary SPA undertaken in 2018 (Ref 24), East Anglia ONE North (Ref 282), East Anglia TWO (Ref 31), Norfolk Boreas (Ref 32), Norfolk Vanguard (Ref 33), Five Estuaries (Ref 36) and European Seabirds at Sea survey data (Ref 48), as well as the sightings data from the LionLink wintering bird survey undertaken in 2023-2024, inshore and beach breeding bird survey in 2024 and the WeBS intertidal surveys at Minsmere undertaken in 2022/23 recorded the following marine birds from this functional group:

a. Black-throated diver
b. Red-breasted merganser
c. Cormorant
d. Red-throated diver
e. Great crested grebe
f. Shag
g. Great northern diver
h. Slavonian Grebe
i. Little grebe

21.6.24 Waggitt et al (2019) (Ref 23) produced distribution maps of selected seabird populations which have been used to illustrate species density within the study area. **Figure 21.4** of this PEIR illustrates the spatial variation in predicted densities for European shag within the species foraging range as noted in **Table 21.7**. **Figure 21.5** of this PEIR illustrates the kernel density estimation (KDE) (a non-parametric method used to estimate the probability density function of a random variable), of the red-throated diver in the Outer Thames Estuary SPA

### Seaducks, geese and swans

21.6.25 This functional group includes species that breed, migrate through, and/or winter in UK waters, utilising a range of inshore and offshore habitats. They exhibit diverse feeding strategies, including benthic, surface, and grazing feeding. Diving sea ducks such as eiders and scoters are specialists in foraging shellfish and

crustaceans, while generalists like long-tailed ducks, goldeneye, and scaup have a varied diet comprising aquatic plants, polychaetes, amphipods, aquatic insects, and small fish. Other ducks, swans, and geese in this group are surface feeders, targeting prey on the surface of intertidal habitats, such as small gastropod molluscs, or grazing on saltmarsh and coastal grazing marsh vegetation.

21.6.26 Most species in this group are sensitive to visual and noise disturbances caused by vessel traffic (Ref 225) (Ref 44). Studies on disturbance effects, including research on common scoters, have shown that some species may not resettle after being flushed (Ref 228) (Ref 225) (Ref 44). However, for many species it remains unclear whether or how quickly they recover and return to areas after vessel activity. While their sensitivity to underwater noise is unknown, benthic-feeding species may be affected by activities that disturb seabed habitats, potentially reducing the availability of their prey.

21.6.27 Digital aerial bird surveys from the Outer Thames Estuary SPA undertaken in 2018 (Ref 24) and European Seabirds at Sea survey data (Ref 48), as well as the sightings data from the LionLink wintering bird survey undertaken in 2023-2024 and inshore and beach breeding bird survey in 2024 recorded the following marine birds from this functional group:

a. Barnacle goose
b. Pintail
c. Brent goose
d. Pochard
e. Canada goose
f. Scaup
g. Greater white-fronted goose
h. Shelduck
i. Greylag goose
j. Shoveler
k. Gadwall
l. Teal
m. Goldeneye
n. Tufted duck
o. Long tailed duck
p. Common scoter
q. Mallard
r. Velvet scoter
s. Mute swan
t. Wigeon

### Auk

21.6.28 Four auk species commonly inhabit UK waters: the Atlantic puffin (*Fratercula arctica*), black guillemot (*Ceppus grille*), common guillemot (*Uria aalge*), and razorbill (*Alca torda*). These birds aggregate in both inshore and offshore waters year-round. During the breeding season, they form large colonies, and disturbances within key foraging areas near these colonies can affect their ability to raise chicks successfully. After fledging, both adults and chicks experience flightless moulting periods. For adults this can last several months, and for chicks it can continue for several weeks. These flightless moulting periods make both adults and chicks particularly vulnerable to anthropogenic pressures such as noise and visual disturbance. Auks are water-column feeders, primarily preying on pelagic and demersal fish.

21.6.29 Auks are sensitive to noise and visual disturbances, with vessel movements through critical foraging areas or aggregations of birds causing disruption. While studies on related species, such as African penguins (*Spheniscus demersus*), suggest that underwater anthropogenic noise can alter foraging behaviour (Ref 229) (Ref 44), the sensitivity of auks to such impacts remains uncertain. Feeding in the water column also makes auks susceptible to changes in water turbidity caused by increased suspended sediment concentrations, which can hinder their ability to locate prey. Additionally, disturbances to or the loss of seabed habitats may reduce the availability of suitable prey, such as sandeel (*Ammodytidae spp.*).

21.6.30 Digital aerial bird surveys from the Outer Thames Estuary SPA undertaken in 2018 (Ref 24), East Anglia ONE North (Ref 282), East Anglia TWO (Ref 31), Norfolk Boreas (Ref 32), Norfolk Vanguard (Ref 33), Five Estuaries (Ref 36) and European Seabirds at Sea survey data (Ref 48), and European Seabirds at Sea survey data (Ref 48), as well as the sightings data from the LionLink wintering bird survey undertaken in 2023-2024 and inshore and beach breeding bird survey in 2024 recorded the following marine birds from this functional group:

a. Guillemot
b. Little auk
c. Atlantic puffin
d. Razorbill

21.6.31 Available spatially referenced distribution maps for this functional group include for razorbill and common guillemot. **Figure 21.5** of this PEIR illustrates the spatial variation in predicted densities for razorbill along with the species foraging range as noted in **Table 21.7** and **Figure 21.6** of this PEIR illustrates the same for the common guillemot within the study area along with the species foraging range as noted in **Table 21.7**.

### Terns, gulls, kittiwakes and gannets

21.6.32 This group includes terns, gulls, kittiwakes, petrels, and gannets, which aggregate in both inshore and offshore waters around the UK. Terns are typically present during spring and autumn migrations and the breeding season, while other species may be found in UK waters year-round. During the breeding season, these birds often form colonies, and sources of anthropogenic disturbance within key foraging areas near these colonies can impact their ability to raise chicks successfully. With the exception of gannets, which are plunge divers, the species in this group are surface feeders, with some also foraging in exposed tidal areas. Their diet includes a variety of marine prey, such as fish, squid, crustaceans, jellyfish, and offal

21.6.33 This functional group has low to moderate sensitivity to noise and visual disturbances, though some species may be attracted to vessels, possibly due to the availability of fishery discards or offal. Their sensitivity to underwater noise remains unknown. As surface feeders, most species in this group may be affected by increased suspended solid concentrations in the water, which could impair their ability to forage successfully for prey (Ref 230) (Ref 44).

21.6.34 Digital aerial bird surveys from the Outer Thames Estuary SPA undertaken in 2018 (Ref 24), East Anglia ONE North (Ref 282), East Anglia TWO (Ref 31), Norfolk Boreas (Ref 32), Norfolk Vanguard (Ref 33), Five Estuaries (Ref 36) and European Seabirds at Sea survey data (Ref 48), as well as the sightings data from the LionLink wintering bird survey undertaken in 2023-2024 and inshore and beach breeding bird survey in 2024 recorded the following marine birds from this functional group:

a. Arctic skua
b. Great skua
c. Arctic tern
d. Herring gull
e. Black-headed gull
f. Kittiwake
g. Caspian gull
h. Lesser black-backed gull
i. Common gull
j. Little gull
k. Common tern
l. Mediterranean gull
m. Fulmar
n. Sandwich tern
o. Gannet
p. Yellow backed gull
q. Great black-backed gull

21.6.35 Available distribution maps for this functional group include for herring gull, kittiwake, and lesser black-backed gull along with the species foraging range as noted in **Table 21.7**. **Figure 21.7, Figure 21.8 and Figure 21.9** of this PEIR illustrates the spatial variation in predicted densities for herring gull, kittiwake, and lesser black-backed gull respectively within the study area.

### Designated sites

21.6.36 There are several designated sites within the study area. These are listed in **Table 21.14** along with the relevant offshore qualifying features and the sites conservation objectives. An overview for each of the sites is also included below. **Figure 21.1** of this PEIR illustrates the location of the designated sites in relation to the Draft Order Limits.

21.6.37 Please note that where qualifying features are noted in grey, these species have foraging ranges that are less than the distance to the Draft Order Limits for the Proposed Offshore Scheme. It is therefore not expected that individuals from the designated site would be using the Proposed Offshore Scheme.

## Table 21.14: Designated sites within the study area

| Designated Site name and Site ID | Distance from Draft Order Limits | Qualifying features | Conservation objectives |
|---|---|---|---|
| Outer Thames Estuary SPA [UK9020309] (Ref 240) | Draft Order Limits cross the SPA for approx. 21km | Qualifies as it hosts the following Annex I birds:<br>• A001 Red-throated diver; wintering<br>• A193 Common tern; breeding; and<br>• A195 Little tern; breeding | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:<br>• The extent and distribution of the habitats of the qualifying features;<br>• The structure and function of the habitats of the qualifying features;<br>• The supporting processes on which the habitats of the qualifying features rely;<br>• The population of each of the qualifying features; and<br>The distribution of the qualifying features within the site. |
| Minsmere - Walberswick SPA [UK9009101] (Ref 237) | Overlaps | Qualifies as it hosts the following Annex I birds:<br>• A195 Little tern; breeding<br>Qualifies as it hosts the following migratory birds<br>• A051 Gadwall; breeding/wintering<br>• A052 Teal; breeding<br>• A056 Shoveler; breeding/wintering<br>• A394 Greater white-fronted geese; wintering | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;<br>• The extent and distribution of the habitats of the qualifying features;<br>• The structure and function of the habitats of the qualifying features;<br>• The supporting processes on which the habitats of the qualifying features rely;<br>• The population of each of the qualifying features; and<br>• The distribution of the qualifying features within the site. |

| Designated Site name and Site ID | Distance from Draft Order Limits | Qualifying features | Conservation objectives |
|---|---|---|---|
| Minsmere - Walberswick Ramsar [UK11044] (Ref 238) | 7m | Qualifies under Criterion 2 (Ref 242) by:<br>• Containing a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh ditch plants from brackish to fresh water;<br>• Supporting an important assemblage of rare breeding birds associated with marshland and reedbeds including bittern, gadwall, teal, shoveler, marsh harrier, avocet and bearded tit *(Panurus biarmicus*). | Ramsar sites do not have specific conservation objectives. However, many of the qualifying features overlap with the SPA designations and in those instances are considered to be covered by those. |
| Benacre to Easton Bavents SPA [UK9009291] (Ref 241) | Approx 3.3km north of the proposed Landfall Site | Qualifies as it hosts the following Annex I species:<br>• A021 Bittern; breeding<br>• A081 Marsh harrier; breeding<br>• A195 Little tern; breeding | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;<br>• The extent and distribution of the habitats of the qualifying features;<br>• The structure and function of the habitats of the qualifying features;<br>• The supporting processes on which the habitats of the qualifying features rely;<br>• The population of each of the qualifying features; and<br>• The distribution of the qualifying features within the site. |

| Designated Site name and Site ID | Distance from Draft Order Limits | Qualifying features | Conservation objectives |
|---|---|---|---|
| Alde-Ore Estuary SPA [UK9009112] (Ref 242) | Approx 17.1km south of the proposed Landfall Site | Qualifies as it hosts the following Annex I birds:<br>• A191 Sandwich tern; breeding<br>• A195 Little tern; breeding | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:<br>• The extent and distribution of the habitats of the qualifying features;<br>• The structure and function of the habitats of the qualifying features;<br>• The supporting processes on which the habitats of the qualifying features rely;<br>• The population of each of the qualifying features; and<br>• The distribution of the qualifying features within the site. |
| Alde-Ore Estuary Ramsar [UK11002] (Ref 243) | Approx 17.1km south of the proposed Landfall Site | Qualifies under Criterion 3 by supporting a notable assemblage of breeding and wintering wetland birds.<br><br>Qualifies under Criterion 6 by supporting an internationally important breeding population of:<br>• A193 Lesser black-backed gull<br><br>Qualifies under Criterion 6 by supporting internationally important wintering populations of the following species:<br>• A132 Avocet<br>• A162 Redshank | Ramsar sites do not have specific conservation objectives. However, many of the features overlap with the SPA designation and are considered to be covered by those. |
| Greater Wash SPA [UK9020329] (Ref 244) | Approx 19km north of the Draft Order Limits | Qualifies as it hosts the following Annex I species<br>• A001 Red-throated diver; wintering<br>• A177 Little gull; wintering | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving |

| Designated Site name and Site ID | Distance from Draft Order Limits | Qualifying features | Conservation objectives |
|---|---|---|---|
| | | • A706 Common scoter; wintering<br>• A191 Sandwich tern; breeding<br>• A631 Little tern; breeding<br>• A193 Common tern; breeding | the aims of the Wild Birds Directive, by maintaining or restoring;<br>• The extent and distribution of the habitats of the qualifying features<br>• The structure and function of the habitats of the qualifying features<br>• The supporting processes on which the habitats of the qualifying features rely<br>• The population of each of the qualifying features, and,<br>• The distribution of the qualifying features within the site. |
| Breydon Water SPA [UK9009181] (Ref 248) | Approx 25km north of the Draft Order Limits | Qualifies as it hosts the following Annex I species:<br>• A132 Avocet; wintering<br>• A037 Bewick's swan; wintering<br>• A193 Common tern; breeding<br>• A140 Golden plover; wintering; and<br>• A151 Ruff; wintering<br><br>Qualifies as it hosts the following migratory birds:<br>• A142 Lapwing; wintering | Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:<br>• The extent and distribution of the habitats of the qualifying features;<br>• The structure and function of the habitats of the qualifying features;<br>• The supporting processes on which the habitats of the qualifying features rely;<br>• The population of each of the qualifying features; and<br>• The distribution of the qualifying features within the site. |

### Outer Thames Estuary SPA

21.6.38 The Outer Thames Estuary SPA extends northwards from the Thames Estuary towards Great Yarmouth on the East Norfolk coast and out into the North Sea. It covers an area of 3,924km$^2$ and was designated in 2010 for the protection of wintering red-throated diver, breeding little tern and breeding common tern. The Proposed Offshore Scheme crosses the Outer Thames Estuary SPA for approximately 22km, with the Draft Order Limits overlapping the Outer Thames Estuary SPA for approximately 11.43km$^2$. It should be noted that the Outer Thames Estuary SPA comprises of three separate areas, which in this PEIR are referred to as North Inshore, North Offshore and South. The Proposed Offshore Scheme overlaps the North Inshore (for a distance of 13.57km and an area of 7.22km$^2$) and North Offshore areas (for a distance of 8.42km and an area of 4.21km$^2$) as illustrated in **Figure 21.1** of this PEIR.

21.6.39 The Outer Thames Estuary SPA supports the largest aggregation of wintering red-throated diver in the UK with an estimated population of 18,079 individuals, based on the peak mean of the 2013 and 2018 surveys.

21.6.40 Digital video aerial surveys were undertaken by Natural England in 2013 (Ref 249) and 2018 (Ref 24). Both surveys identified that the area of the SPA intersected by the Draft Order Limits supported low densities of red-throated diver. The highest densities were recorded within the southern section of the SPA, which the Draft Order Limits do not enter. As such, the Proposed Offshore Scheme avoids the area of the SPA with higher densities of red-throated diver.

21.6.41 **Figure 21.10** of this PEIR illustrates the 2013 survey results in relation to the Draft Order Limits and **Figure 21.11** illustrates the same using the 2018 survey results.

21.6.42 Red-throated diver was recorded by the LionLink inshore and beach breeding bird survey 2023-2024 where two individuals were record from the Southwold vantage point in April 2024. Red-throated diver was also recorded in the WeBS intertidal surveys at Minsmere undertaken in 2022/23, these numbers are shown in **Table 21.12**.

21.6.43 The LionLink wintering bird survey which was undertaken in 2023/24 recorded a total count of 160 red-throated diver from both vantage points during the six-month period the survey was carried out in. The total count is shown in **Table 21.13** and illustrated in **Figure 21.12** of this PEIR which shows the breakdown of these sitings by month. Table 21.15 shows the numbers of birds recorded by month during the LionLink wintering bird surveys undertaken in 2023/24.

**Table 21.15: LionLink Wintering bird survey 2023/24 red-throated diver raw counts**

| Vantage point | October | November | December | January | February | March |
|---|---|---|---|---|---|---|
| Southwold | 0 | 17 | 18 | 0 | 0 | 46 |
| Proposed Landfall (Walberswick) | 1 | 1 | 4 | 0 | 1 | 72 |
| Total | 1 | 18 | 22 | 0 | 1 | 118 |

21.6.44 Red-throated diver are known to be highly sensitive to anthropogenic activities, including visual disturbances such as increases in vessel and personnel movements (Ref 44). These can affect birds that are roosting, rafting and feeding and cause displacement of individuals (Ref 225). Small vessels can approach red-throated diver by up to 1km before they take flight (Ref 258) although reactions to vessel approach vary between individual birds.

21.6.45 The Outer Thames Estuary SPA also protects foraging areas for common tern and little tern during the breeding season. The SPA supports around 2.66% of the UK population of common tern, and around 19.64% of the UK population of little tern. The closest colony of common tern lies outside of the study area at Breydon Water SPA. The proposed Landfall Site at Walberswick is at the limit of the foraging range for the colony according to predictive relative usage maps that informed the delineation of the SPA boundary (Ref 284). Using the mean maximum breeding foraging range + 1 SD (Ref 19) for common tern (26.9km), it is possible that breeding individuals from the Breydon Water SPA could forage within the Draft Order Limits outside of the landfall, in the remaining North Inshore Section, for an area of approximately 3.2 km². However, the rest of the Draft Order Limits is beyond this foraging range. Common tern were recorded in WeBS surveys at Minsmere in 2022/23 and Benacre 2019/20, where total counts are shown in **Table 21.12** and in the ESAS JNCC surveys in 2010 shown in **Table 21.13**.

21.6.46 The closest colony for little tern lies within the Minsmere-Walberswick SPA discussed below. The proposed Landfall Site overlaps the SPA and therefore is within the 4km foraging range from the colony. Little tern were recorded in the WeBS surveys at Benacre but not in the surveys at the proposed Landfall Site.

### Minsmere-Walberswick SPA and Ramsar

21.6.47 The Minsmere-Walberswick SPA lies in proximity to the proposed Landfall Site. It is an intertidal site on the Suffolk coast and extends between Southwold and Sizewell. The SPA overlaps with the Minsmere-Walberswick Heaths and Marshes Special Area of Conservation and the Minsmere-Walberswick Ramsar site to form the Minsmere-Walberswick European Marine Site. It also includes the Minsmere-Walberswick Heaths and Marshes Site of Special Scientific Interest (SSSI).

21.6.48 The Minsmere-Walberswick SPA and associated Ramsar and SSSI is formed of a variety of habitats which support the designated bird species of the site, including saltmarsh, shingle beaches, intertidal mud and mixed sediment, and coastal reedbeds. It is of particular importance during the winter months, supporting nationally and internationally important numbers of migratory wildfowl and waders.

### Benacre to Easton Bavents SPA

21.6.49 The Benacre to Easton Bavents SPA is 4.4km from the proposed Landfall Site. It includes the Pakefield to Easton Bavents SSSI and Benacre National Nature Reserve (NNR). The SPA incorporates internationally important stretches of shingle, dunes, saltmarsh and coastal lagoons of importance for breeding, wintering and passage birds. Its qualifying features include Bittern; breeding, Marsh harrier; breeding and little tern; breeding. It also supports assemblages of breeding and wintering birds as well as Annex I species including occasional wintering red-throated diver and breeding avocet and common tern, it is important to note that these species are not qualifying features of the SPA. The Pakefield to Easton Bavents SSSI supports a number of habitats of importance for nationally important populations of breeding and overwintering bittern and breeding little tern, marsh harrier, water rail (*Rallus aquaticus*) and bearded tit, as well as several other breeding bird assemblages.

### Alde-Ore Estuary SPA and Ramsar

21.6.50 The Alde-Ore Estuary SPA is located on the Suffolk coast between Aldeburgh to the north and Bawdsey to the south and is approximately 17km from the proposed landfall site at Walberswick. The SPA includes Havergate Island and Orford Ness, as well as the estuaries of the rivers Alde, Butley and Ore. The SPA is composed of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), intertidal mudflats, shingle, coastal lagoons and estuarine fish communities. Bird usage of habitats within the SPA varies seasonally, with different areas being utilised for nesting and feeding at different times of the year.

21.6.51 It supports important feeding habitats within intertidal mudflats for avocet, redshank and ruff (*Calidris pugnax*). The estuary provides a feeding habitat for little and Sandwich tern. The lagoons located within the site provide additional feeding grounds for avocet and little tern and, as the tide advances up the estuary and the birds move inland, the saltmarsh becomes an important foraging area for little tern and mudflat feeding species such as redshank. Both the little and Sandwich tern may also forage offshore.

21.6.52 The site also provides good nesting habitat. The shingle areas around Orford Ness are important for nesting little and Sandwich tern. The saltmarsh that is particularly widespread at Havergate Island, Orford Ness and along the Butley and Alde rivers, is important for nesting marsh harrier, avocet and lesser black-backed gull.

### Greater Wash SPA

21.6.53 The Greater Wash SPA covers an area of 3,536km$^2$ stretching from Bridlington Bay, Yorkshire along the east coast of England to the existing northern boundary of the Outer Thames Estuary SPA off the Suffolk coast (Ref 245). It encompasses a variety of different habitats, including coarse sediments, sand, mud and mixed sediments in the north; subtidal sandbanks in the mouth of the Humber Estuary; extensive areas of subtidal sandbanks offshore from coast of Norfolk; mosaic of sand and mixed sediments, muddy sands, coarse sediments and occasionally Annex I reef inshore off Norfolk. The coast off Suffolk is largely soft sediment. The majority of the site is below 30m in water depth, with a single deep channel of 90m water depth on the approach to the Wash (Ref 246).

21.6.54 The Greater Wash SPA is designated for nationally important numbers of non-breeding red-throated diver, common scoter and little gull; and nationally important numbers of breeding common tern, little tern and sandwich tern (Ref 244).

### Breydon Water SPA

21.6.55 The Breydon Water SPA covers an area of 12.02km$^2$. At high tide Breydon Water forms a large water body and as the tide recedes, remaining water forms a narrow channel. The SPA incorporates several important supporting habitats such as, intertidal mudflats, saltmarsh and fresh water grazing marsh. Shallow tidal waters provide key feeding and roosting habitat for many of the bird species using the site. The extensive areas of intertidal mudflats at Breydon Water support dense populations of marine invertebrate species, such as Arenicola, Hediste and oligochaetes, which in turn provide a food source for large populations of waterbirds (wildfowl and waders). As a result, Breydon Water is a key estuary in the UK for wintering waterfowl.

21.6.56 The site supports internationally important wintering populations of Bewick's swan, avocet, golden plover, ruff, and an internationally important breeding population of common tern. Nationally important bird populations within the internationally important waterfowl assemblage include; cormorant, European white-fronted goose, wigeon, shoveler and black-tailed godwit (Ref 247).

## Relevant transboundary European sites

21.6.57 There are two transboundary European designated sites that have been identified as relevant. Both are designated for marine birds which have a foraging range that would include the Proposed Offshore Scheme. These designated sites are listed in **Table 21.16.**

**Table 21.16: Relevant transboundary European designated sites**

| Designated Site Name and Site ID | Distance from Proposed Offshore Scheme | Qualifying features |
|---|---|---|
| Bruine Bank SPA [NL2021168] (Ref 247) | 41km east | • A200 Razorbill<br>• A678 Guillemot |
| Friese Front SPA [NL2016166] (Ref 248) | 79km north east | • A678 Guillemot |

### Protected species

#### Wildlife and Countryside Act 1981 and Conservation of Offshore Marine Habitats and Species Regulations 2017

21.6.58 In the UK, the protection of marine birds is governed by the Wildlife and Countryside Act 1981 which applies out to 12NM from the coast, and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) which applies from 12NM to 200NM. These two pieces of UK legislation implement the requirements of the European Commission Birds Directive (Directive 79/409/EEC and later amended to Directive 2009/147/EC) (Ref 256). The laws aim to protect all wild birds, their nests and eggs. They divide species into birds that are particularly threatened which are listed in Annex I of the Birds Directive and regularly occurring migratory bird species.

21.6.59 Of the 15 Annex I species noted in the Birds Directive nine species have been recorded within the study area.

a. Red-throated diver
b. Little tern
c. Black-throated diver
d. Sandwich tern
e. Great northern diver
f. Common tern
g. Slavonian grebe
h. Arctic tern
i. Mediterranean gull

21.6.60 Of the 37 migratory species 25 species have been recorded in the study area.

a. Common eider
b. Arctic skua
c. Long-tailed duck
d. Little gull
e. Common scoter
f. Black-legged kittiwake
g. Surf scoter
h. Black-headed gull
i. Velvet scoter
j. Common gull
k. Common goldeneye
l. Lesser black-backed gull
m. Red-breasted merganser
n. Herring gull
o. Goosander
p. Great black-backed gull
q. Northern fulmar
r. Common guillemot
s. Northern gannet
t. Razorbill
u. Great cormorant)
v. Little auk

w. European shag
x. Atlantic puffin
y. Great crested grebe

### NERC Act

21.6.61 Section 41 of the NERC Act provides a list of habitats and species that are of principal importance for biodiversity conservation (Ref 249). Of the 49 bird species listed five of these species have been recorded in the study area.

a. Bewick's Swan
b. Bittern
c. Curlew
d. Herring gull
e. Lapwing

### UK Biodiversity Action Plan (UK BAP)

21.6.62 The UK was the first country to produce a national biodiversity action plan (Ref 257). The UK BAP described the biological resources of the UK and provided detailed plans for conservation of these resources. UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action. The current list from 2007 includes 59 species, some of which are marine bird species. Six of these species have been recorded in the study area:

a. Black-throated diver
b. Common scoter
c. Herring gull
d. Curlew
e. Black-tailed godwit
f. Arctic skua

### The International Union for Conservation (IUCN) Red List

21.6.63 The International Union for Conservation (IUCN) have been collating, since 1964, a list of threatened species including birds, which looks at the state of a species on a global and more regional basis. Several species which have been recorded within the study area are noted to be 'Near Threatened or Vulnerable' on the IUCN red list (Ref 250).

21.6.64 The below bird species on the IUCN red list have been recorded within the study area.

a. Black-legged kittiwake
b. Atlantic puffin
c. Oystercatcher
d. Curlew
e. Red-breasted merganser
f. Slavonian grebe
g. Long-tailed duck
h. Velvet scoter
i. Black-tailed godwit
j. Dunlin
k. Grey plover
l. Lapwing
m. Common eider

### Future baseline

21.6.65 The future baseline considers changes which may affect the future environment in the absence of the Proposed Offshore Scheme. It takes into account any developments that are likely to be present in the future such as consented offshore wind farms.

21.6.66 The ornithology population in the North Sea has a number of impacts acting upon it at present, including changes in prey availability due to climate change, alterations in commercial fisheries and cumulative disturbance and displacement from offshore developments and activities in the oil and gas and renewable sectors (Ref 251, Ref 252). In addition, some populations are still recovering from the 2022 outbreak of Highly Pathogenic Avian Influenza (HPAI, Avian Influenza) so future monitoring may reveal new population trends in the North Sea (Ref 253).

21.6.67 Trends in breeding seabird populations are better understood than birds at sea, as the breeding number of some colonies are regularly monitored. There have been four comprehensive censuses of breeding birds in the British Isles undertaken in 1969 - 70, 1985-88, 1998 – 2002, (Ref 260) and 2015 – 2021 (Ref 261) as well as many single species surveys. Whereas the numbers at sea are not as easy to assess.

21.6.68 Breeding populations of marine bird species in the North Sea are closely monitored as part of the Seabird Monitoring Programme (SMP) which is funded jointly by the British Trust for Ornithology (BTO) and JNCC, in association with the Royal Society for the Protection of Birds (RSPB). The latest annual report from the SMP, published in 2024, provides a detailed analysis of bird survey data from 2021, 2022 and 2023 and considers historic data dating back to 1986, concluding a general declining trend in English seabird populations (Ref 254, Ref 255).

21.6.69 The most recent survey results identified the main reasons for the decline in seabird population in the British Isles are predation by invasive and native predators and climate change (Ref 262). The adverse weather conditions associated with climate change may affect nesting and foraging and potential increases in sea temperature may reduce the availability of prey species such as sandeel.

21.6.70 These impacts are exacerbated by commercial fisheries and fish stock depletion, resulting in depleted food sources during the breeding season. Sand eel stocks in the North Sea have been observed to decline as a result of fishing pressures. Sandeel are recognised as being the most important prey fish stock for North Sea seabirds during the breeding season and it is considered unlikely that stocks would recover sufficiently. There has been a ban on the fishing of sand eel within the North Sea for the last three years in an effort to protect the marine ecosystem and increase stocks (Ref 263).

21.6.71 Fisheries management is likely to affect future numbers in seabird populations. The Common Fisheries Policy (CFP) Landings Obligation ('discard ban') would reduce food supply for scavenging seabirds such as great black-backed gulls, lesser black-backed gulls, herring gulls, fulmars, kittiwakes and gannets (Ref 264, Ref 265, Ref 266).

21.6.72 The impacts of climate change may further impact bird species within the intertidal and offshore seas of the UK as a result of increased stormy conditions in winter and other areas such as the Baltic Sea becoming more favourable as wintering areas due to warming.

## 21.7 Embedded design mitigation and control measures

### Design and embedded mitigation measures

21.7.1 As described in **Chapter 2 Description of the Proposed Scheme** of this PEIR, a range of measures have been embedded into the Proposed Scheme design to avoid or reduce environmental effects. These primary mitigation measures form part of the design that has been assessed, which for intertidal and offshore ornithology are listed in **Table 21.17.**

**Table 21.17: Design and embedded mitigation measures for intertidal and offshore ornithology**

| Commitment Reference Code | Measure | Compliance Mechanism |
|---|---|---|
| **OD01** | All cables will be installed in one trench. | CEMP secured by DML |
| **OD03** | A trenchless cable installation method (such as horizontal directional drilling) will be used to avoid disturbance to surface sediments and habitats, with the exit point seaward of the 0m LAT water depth contour. | CEMP secured by DML |
| **OD04** | The intention is to bury the cables in the seabed, except in areas where trenching is not possible e.g. where ground conditions do not allow burial or at infrastructure crossings. | CEMP secured by DML |
| **OD05** | External cable protection shall only be used where it can be demonstrated that adequate burial depth cannot be achieved (e.g., where ground conditions do not allow burial or at infrastructure crossings); the footprint of any external protection shall be the minimum required to ensure adequate cable protection and stability. | CEMP secured by DML |
| **OD06** | Where possible cable protection materials will be selected to match the environment (e.g. when cables are installed in areas of cobbles or other natural rock features, rock of similar diameter as the receiving environment should be used as an | CEMP secured by DML |

| Commitment Reference Code | Measure | Compliance Mechanism |
|---|---|---|
| | alternative to the current normal approach of using terrestrially sourced granite where possible). | |
| **OD07** | Design and construction will be carried out in accordance with International Cable Protection Committee (ICPC) Recommendations. | CEMP secured by DML |
| **OD08** | Micro-routeing within the Order Limits to avoid sensitive environmental constraints and minimise the risk of exposure by seabed mobility | CEMP secured by DML |

### Control measures

21.7.2 Control measures are set out in **Appendix 2.2 Outline Offshore Construction Environmental Management Plan** which will manage the effects of construction. The measures of particular relevance to intertidal and offshore ornithology are shown below in **Table 21.17.**

21.7.3 Several management plans will be provided as Outline Management Plans with the development consent application to support the Deemed Marine Licence. These will include an Outline Construction Environmental Management Plan (CEMP) (including biosecurity plan details) and an Outline Marine Pollution Contingency Plan (MPCP).

21.7.4 These documents will outline control 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 Natural England 'Best Practice Protocol for Vessels in Red-throated Diver SPAs') during all phases of the Proposed Offshore Scheme. Final management plans will be submitted in accordance with the DML to discharge the licence conditions.

21.7.5 The Applicant would ensure that all work that is undertaken during construction, operation and maintenance and decommissioning complies with the requirements of relevant national and international legislation.

**Table 21.18: Control measures for intertidal and offshore ornithology**

| Commitment Reference Code | Measure | Compliance Mechanism |
|---|---|---|
| **OC01** | An offshore Construction Environmental Management Plan (CEMP) including an Emergency Spill Response Plan (ESRP), Waste Management Plan, Marine Pollution Contingency Plan (MPCP), Biosecurity Plan and Marine Mammal Mitigation | DML secured through DCO |

| Commitment Reference Code | Measure | Compliance Mechanism |
|---|---|---|
| | Plan (MMMP) and a dropped objects procedure will be produced prior to installation. | |
| **OC02** | All project vessels must comply with the International Regulations for Preventing Collisions at Sea (1972) (IMO, 2019a), regulations relating to International Convention for the Prevention of Pollution from Ships (the MARPOL Convention 73/78) (IMO, 2019e) with the aim of preventing and minimising pollution from ships and the International Convention for the Safety of Life at Sea (SOLAS, 1974). | CEMP secured by DML |
| **OC04** | All oil, fuel and chemical spills will be reported to the MMO Marine Pollution response team | DML secured through DCO |
| **OC10** | Existing shipping lanes will be utilised for all vessel transiting routes to avoid additional disturbance, where practicable and noting the requirements in OC11. | CEMP secured by DML |
| **OC11** | Vessels operating within the Outer Thames Estuary SPA from 01 November to 30 March (inclusive) will be made aware of the importance and sensitivity of the species to disturbance through tool box talks. Vessels will avoid rafting birds and areas with high densities of birds, where practicable. Over-revving of engines will be avoided. Vessel transit routes through the Outer Thames Estuary SPA will be minimised and will be within the Draft Order Limits or the vessel transit routes defined in **Figure 21.15** of this PEIR. | CEMP secured by DML |
| **OC12** | Artificial lighting on vessels will be directional and only used when necessary, noting that health and safety requirements will need to be met for safe working practices. | CEMP secured by DML |
| **OC40** | Any vessels transiting through the South area of the Outer Thames Estuary SPA from 01 November to 30 March (inclusive), would follow the designated shipping lanes or as instructed by the Port Authority. | CEMP secured by DML |

## 21.8 Assessment of effects

21.8.1 This section presents the preliminary assessment of likely significant effects on intertidal and offshore ornithology resulting from the construction, operation, maintenance, and decommissioning of the Proposed Offshore Scheme. The likely significant effects of the Proposed Offshore Scheme are identified taking into account the embedded design mitigation and control measures.

21.8.2 Following assessment further mitigation is proposed as required which is presented in **Section 21.9**, in order to reduce potential impacts and allow for a subsequent assessment of the residual impacts.

### Construction

21.8.3 It is anticipated that the construction programme for the Proposed Offshore Scheme would be split into multiple campaigns, one route preparation campaign and multiple cable lay and burial campaigns. Pre-construction phase activities, such as surveys, route preparation, boulder clearance, pre-sweeping and infrastructure crossing preparation, are expected to take up to one year to complete. Each of the cable laying campaigns is expected to take approximately 6 months. As set out in **Chapter 2 Description of the Proposed Scheme** of this PEIR, installation vessels are estimated to install the Offshore Submarine HVDC cable at an indicative speed of between 100m and 500m per hour, depending on seabed conditions and the vessels used.

21.8.4 The HVDC Submarine Cables would be installed in one trench, with installation methodologies including simultaneous cable lay and trenching, and surface cable lay followed by post lay trenching. Cable burial tools which may be used include jet trenching machines, mechanical trenchers, control flow excavators and ploughs. Overall, displacement ploughs/boulder clearance ploughs would result in the greatest seabed disturbance, however this method would only be required within discrete sections (see **Chapter 2 Description of the Proposed Scheme** of this PEIR). Additional information on the construction techniques is provided in **Chapter 2 Description of the Proposed Scheme** of this PEIR.

#### Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment

21.8.5 Intertidal and marine bird species are mobile in nature and may be able to avoid anthropogenic disturbance. However, individual species react differently to offshore development, with some species actively choosing to avoid sources of disturbance (not returning until sometime later), whilst others show little sensitivity, continuing with their activities. Species sensitivity to disturbance can often depend on the time of year. During specific seasons some species may have limited ability to alter their use of an area. For example, during the chick-rearing period, birds need to return frequently to the colony to feed and care for chicks. Birds can be discouraged from using feeding grounds or be forced further afield to forage if there are regular disturbances. Post-breeding, certain species such as Atlantic puffin are flightless, as they undergo a moult causing them to spend extended periods of time rafting on the sea surface, making them vulnerable to vessel movements. For other species, such as red-throated diver, winter and spring months are the most sensitive period as they remain at sea to forage, making them sensitive to unnecessary flight.

21.8.6 Disturbance may result in the bird choosing to move to continue their activity elsewhere either by swimming or flying away. If the bird is continually disturbed, or they must move a significant distance to find alternative grounds, this can cause the birds to expend additional energy and reduce feeding time to avoid obstacles. There may be a significant impact, altering the condition or distribution

of species. Displacement occurs when a bird is deterred from entering an area because of the human activity that is taking place, which again may restrict their ability to access prime habitat.

21.8.7 It should be noted within the assessment some species are mentioned more than others. This is primarily due to their high levels of sensitivity, but also the amount of data available on a species.

21.8.8 The number of vessels engaged in construction would vary over the duration of the construction phase. Further information on construction can be found in **Chapter 2 Description of the Proposed Scheme** of this PEIR. The worst-case design scenario with regards to the number and duration of vessels which could be working within the Draft Order Limits and specifically within the Outer Thames Estuary SPA during construction is:

a. A peak of up to 16 vessels could be present for up to 30 days within the Outer Thames Estuary SPA at the proposed Landfall Site during the cable pull.
b. The maximum duration a single vessel would be present within the Outer Thames Estuary SPA is 30 days (associated with the landfall enabling works).
c. At other times, the number of vessels present within the Draft Order Limits would vary but would be spread across the Draft Order Limits engaged in activities in different locations.

### Outer Thames Estuary (OTE) SPA

21.8.9 The Draft Order Limits overlap the OTE SPA for approximately 22km from the proposed Landfall Site seaward. The OTE SPA covers a total area of 3924.52km$^2$ and is split into three discrete areas. These are described in this PEIR as North Inshore, North Offshore and South. The Draft Order Limits cross the North Inshore and North Offshore areas.

21.8.10 Natural England's Advice on Operations and Maintenance for the OTE SPA provides sensitivity assessments for the three designated bird features under the pressure 'visual disturbance'.

*Common and little tern*

21.8.11 The two tern species are present as breeding features of the site between April and August. Natural England's Advice on Operations and Maintenance (Ref 267) states that the sensitivity of the features to visual disturbance is low. The advice notes that whilst foraging at sea, the tern species all have low sensitivity to visual disturbance from vessels. They are highly manoeuvrable in flight and as surface feeding species have a low disturbance susceptibility score of 2, as defined by MIG-BIRD, (2022) (Ref 41). It is acknowledged that little tern have high habitat specialisation with a score of 4 (Ref 41) i.e., they may be limited in seeking alternative foraging areas. The closest colony for little tern lies within the Minsmere-Walberswick SPA. The baseline established that the Proposed Offshore Scheme Draft Order Limits overlap the SPA (at the proposed Landfall Site). However, survey data from 2011-2013 (Ref 272) did not identify any apparently occupied nests for little tern and no individuals were recorded at the

proposed Landfall Site during the LionLink inshore and beach breeding bird survey 2023-2024 (**Appendix 8.15 Baseline Report – Inshore and Beach Breeding Survey Report 2024** of this PEIR). Common tern do not have a habitat specialisation score however, it can be presumed to be either moderate or high similar to the rest of the functional group (Ref 41). The baseline established that the closest colony of common tern is at Breydon Water SPA. According to predicted relative usage maps (Ref 271), the Draft Order Limits are towards the limit of the foraging range for the colony where predicted relative usage is lowest (0.00-0.08 per $km^2$). Therefore, it is unlikely that the Draft Order Limits are important feeding grounds for common tern or little tern.

21.8.12 As tern species are not classes as sensitive to disturbance and the Draft Order Limits do not overlap with the prime foraging areas, the magnitude of the impact has been assessed as negligible.

21.8.13 In conclusion, the significance of the effect of visual and physical disturbance or displacement has been assessed as **Negligible** and **Not Significant** for Common tern and little tern during construction and decommissioning.

*Red-throated diver*

21.8.14 The most sensitive period for red-throated diver within the OTE SPA is for the period November to March (inclusive). Natural England's Advice on Operations and Maintenance states that red-throated diver have a high sensitivity to visual disturbance. They exhibit strong behavioural responses to anthropogenic sources of disturbance, avoiding shipping lanes and other areas of high activity (Ref 44, Ref 231, Ref 232, Ref 233).

21.8.15 Red-throated diver has been categorised with a disturbance susceptibility of 5 and habitat specialisation score of 4 (Ref 40), the highest in both categories. They have a mean escape distance of 750m and a maximum of 1700m as observed by Fliessbach et al (2019) (Ref 225). This means that if they are displaced by project vessels from a specific foraging area they may have limited opportunity to find alternative locations. The sensitivity of the species to the impact has been assessed as high.

21.8.16 JNCC advised that a displacement buffer of 2km with 100% displacement should be considered for vessel displacement for red-throated diver (response to EIA Scoping Opinion). A geographical information system was used to calculate the area of which the Draft Order Limits overlap with the SPA. This has then been used to determine the estimated number of birds that could be displaced based on density estimates from the 2013 and 2018 aerial surveys of the Outer Thames Estuary SPA. Additional information on the methodology, calculations and conclusions will be provided in the ES. It is important to note that, although certain sections of the Draft Order Limits lie outside the SPA, the displacement buffer still overlaps areas where the Draft Order Limits are adjacent to the SPA. **Table 21-18** shows the total area of the OTE SPA that could be impacted by the Proposed Offshore Scheme.

**Table 21.19: Areas within the Outer Thames Estuary SPA affected by the Proposed Offshore Scheme**

| SPA section | Area within 2km buffer (km²) | % of total SPA impacted |
|---|---|---|
| North Inshore | 100.17 | 2.55 |
| North Offshore | 53.40 | 1.36 |
| Total | 143.47 | 3.91 |

21.8.17 The highest risk activity in terms of the potential for bird displacement is the HDD enabling works and cable pull-in. During this activity a large number of vessels (7 - 11) could be present for a prolonged period of time (up to 60 days for HDD enabling works and 14 days for cable pull-in). If these activities were to take place during the winter period (01 November to 31 March) it would cause displacement of red-throated diver. A red-throated diver displacement assessment is currently being consulted on with Natural England. The results of the assessment will be used to inform the ES. The preliminary assessment has concluded that the magnitude of the impact would be low as the activities would only take place within a small area of the Outer Thames Estuary SPA.

21.8.18 In conclusion, the significance of the effect has been assessed as **Moderate** and **Significant** for red-throated diver during construction for the HDD enabling works and cable pull-in.

21.8.19 Outside of the HDD enabling and cable pull-in works, other activities would be limited in duration to 1 - 6 days and involve 1-2 vessels at a time. If these activities were to take place during the winter period (01 November to 31 March) it would cause displacement of red-throated diver. As described above, the ES will be informed by a red-throated diver displacement assessment. The preliminary assessment has concluded that the magnitude of these impacts would be negligible and the significance of the effect would be **Minor** and **Not Significant**.

21.8.20 The Applicant has committed to control measures which form part of "Natural England's Best Practice Protocol for Vessels in Red-Throated Diver SPAs" (Ref 43) i.e., Commitment Reference Codes OC10 and OC11. Further additional measures for specific high-risk activities (HDD enabling works and cable pull-in) within the Outer Thames Estuary SPA are being discussed with statutory consultees and will be detailed as part of the ES.

### Disturbance and displacement due to transiting vessels

21.8.21 During the construction phase of the Proposed Offshore Scheme there will be an increase in vessel movements associated with the Project which could lead to potential disturbance of seabirds. As discussed above in **paragraphs 21.8.9** to **21.8.20**, this temporary disturbance may result in the displacement of seabirds from within the Draft Order Limits but also through any designated sites which the vessels may transit through.

21.8.22 At this stage the Principal Contractor has not been appointed; it is therefore unknown what ports the project vessels would be transiting to/from. A maximum design envelope for the number of vessels will be provided in the ES**.** Further information about the construction and the project vessels that may be used for the Proposed Offshore Scheme can be found in **Chapter 2 Description of the Proposed Scheme** of this PEIR.

Outer Thames Estuary SPA

21.8.23 Draft designated transit routes have been assigned through the North Inshore area of the Outer Thames Estuary SPA as illustrated in **Figure 21.15** of this PEIR for use during the period 01 November to 30 March (inclusive). These routes have been selected to follow current shipping routes to provide entry points to the Draft Order Limits from the ports within the SPA. The Applicant will commit to either entering the Draft Order Limits outside of the SPA and transiting along the Draft Order Limits in the SPA or using the proposed transit routes (OC11).

21.8.24 For any vessels transiting through the South area of the SPA, the vessels would follow the designated shipping lanes or as instructed by the Port Authority (OC40).

21.8.25 In addition to the above vessel transits from ports which are north of the Proposed Offshore Scheme have also been assumed. These routes would come either from the ports of Great Yarmouth or Lowestoft transiting through the North Inshore section of the Outer Thames Estuary SPA as illustrated in **Figure 21.15** of this PEIR.

21.8.26 As noted in **paragraph 21.8.22** it is unknown at this stage where the port of origin may be for the construction vessels and the total number of vessels needed at any one time. This information will be estimated in the ES to define worst-case scenarios.

21.8.27 Any transiting project vessels from the Proposed Offshore Scheme during winter months will follow existing shipping routes through the OTE SPA (as per OC11 and OC40). Therefore, the magnitude of impact has been assessed as low.

21.8.28 It is known that the red-throated diver, which is a qualifying feature of the OTE SPA, is sensitive to visual or physical disturbance and as such has a high level of sensitivity. The routes which the vessels will transit through are existing shipping lanes, and evidence suggests that such species avoid areas with high shipping intensity (Ref 30; Ref 230) and may already avoid shipping lanes by several kilometres (Ref 278). As transiting vessels would use existing shipping lanes, the Proposed Offshore Scheme would not expand the area of displacement already created.

21.8.29 The conclusion of the preliminary assessment is that the significance of the effect is **Minor** and is **Not Significant.**

### Divers, grebes and mergansers

21.8.30 Divers, grebes and mergansers are highly sensitive to noise and visual disturbance (Ref 44). Species from this functional group may not resettle quickly after being flushed, with escape distances (i.e., the distance at which they will move away from a vessel) being several kilometres.

21.8.31 Nine species from this functional group are known to be present within the study area. Species generally forage in shallow waters over sandy or muddy seabeds or in rocky areas. The foraging ranges for these species are between approximately 9km and 33km from the coastline (Ref 19), suggesting that they are unlikely to be present within the majority of the Draft Order Limits. The Proposed Offshore Scheme is largely sited offshore >35km from the coastline; only the first 2.73km$^2$ of the Draft Order Limits are within the foraging range. The area of the Draft Order Limits within the foraging range is approximately 18.9km$^2$, equivalent to 19.5% of the overall Draft Order Limits.

21.8.32 As illustrated in **Chapter 23 Shipping and Navigation** of this PEIR the areas of the Draft Order Limits closer to the coast are subject to higher levels of shipping activity. **Figure 21.13** and **Figure 21.14** of this PEIR presents red-throated diver densities from 2013 and 2018 overlaid against vessel density, illustrating the Draft Order Limits already lie in areas where the functional group are anticipated to experience displacement. As identified by the establishment of various SPAs in the region there are alternative prime feeding grounds for the species. Whilst it is acknowledged that the sensitivity of the functional group is high to disturbance and/or displacement pressure, due to the Draft Order Limits not providing prime feeding grounds for the functional group the assessment has concluded that the sensitivity of the functional group to the impact is medium.

21.8.33 Construction would progress in a linear manner along the Draft Order Limits over a 36-month period. Disturbance and displacement impacts would be temporary and reversible with individuals able to return once vessels have passed through. There would be no permanent barrier to accessing foraging, loafing and resting areas. Alternative, preferred foraging areas are available in the wider region for the functional group and the Proposed Offshore Scheme would not lead to a change in distribution of species. The magnitude of the impact has been assessed as negligible.

21.8.34 In conclusion the overall significance of visual and physical disturbance or displacement due to the presence of Project vessels and equipment for divers, grebes and mergansers has been assessed as **Minor** and **Not Significant**.

### Seaducks, geese and swans

21.8.35 Some species of seaducks are highly sensitive to visual disturbance, with escape distances of 2 – 3.2km observed (Ref 225). The impacts of vessels on geese and swans are not well recorded. Collated evidence to advise on likely sensitivity to human disturbance (e.g., pedestrians), recommends a buffer zone of 50m –

1000m depending on the species and the season (breeding or non-breeding) (Ref 265).

21.8.36 Twenty species from this functional group are known to be present within the study area including species such as common and velvet scoter and long-tailed duck.

21.8.37 Seaducks such as common and velvet scoter and long tailed duck are considered to be highly sensitive to visual disturbance, and it is not known how rapidly they resettle following disturbance. Common scoter has been categorised with a disturbance susceptibility of 5 and habitat specialisation score of 4 in MIG-Bird (2017) (Ref 41), the highest in both categories. Velvet scoter has been categorised with a disturbance susceptibility of 5 and habitat specialisation score of 3 (Ref 41). Long-tailed duck has been categorised with a disturbance susceptibility of 3 and habitat specialisation score of 4 in (Ref 41). As seaduck are the more sensitive species in the functional group they drive the assessment of sensitivity. The sensitivity of the functional group to the impact has been assessed as high.

21.8.38 Seaducks are found in coastal waters, generally within 30 km of the coast (based on the foraging range for long-tailed duck, other species within the functional group have shorter foraging ranges). The Proposed Offshore Scheme is largely sited offshore >35km from the coastline; only the first 2.73km$^2$ of the Draft Order Limits are within the foraging range. The area of the Draft Order Limits within the foraging range is approximately 18.9km$^2$, equivalent to 19.5% of the overall Draft Order Limits.

21.8.39 Construction would progress in a linear manner along the draft Order Limits over a 36-month period. Disturbance and displacement impacts would be temporary and reversible with individuals able to return once vessels have passed through. There would be no permanent barrier to accessing foraging, loafing and resting areas. Alternative, preferred foraging areas are available in the wider region for the functional group and the Proposed Offshore Scheme would not lead to a change in distribution of species. The magnitude of the impact has been assessed as negligible.

21.8.40 In conclusion the overall significance of visual and physical disturbance or displacement due to the presence of Project vessels and equipment for seaducks, geese and swans has been assessed as **Negligible** and **Not Significant.**

### Auks

21.8.41 Auks' sensitivity to visual disturbance is lower than that of other functional groups. Post-breeding they moult and become flightless, forming large aggregations on the water.

21.8.42 Species from the group known to be present within the study area include guillemot, Atlantic puffin, little auk and razorbill. Though some auk species have

been sighted during bird surveys within the Proposed Offshore Scheme they are not qualifying features for any of the nearby designated sites.

21.8.43 Common guillemot, razorbill and Atlantic puffin have a disturbance susceptibility of 3 (out of 5), with Atlantic puffin scoring 2 (out of 5) MIG-Bird (2017) (Ref 41) Fliessbach et al. (2019) (Ref 225) report escape distances to be on average 395 m (± 216 m) for razorbill, suggesting that the zone of influence of displacement and disturbance would be limited to within the draft Order Limits. The sensitivity of the species to the impact has been assessed as low.

21.8.44 Construction would progress in a linear manner along the Draft Order Limits over a 36-month period. Disturbance and displacement impacts would be temporary and reversible with individuals able to return once vessels have passed through. There would be no permanent barrier to accessing foraging, loafing and resting areas. Alternative, preferred foraging areas are available in the wider region for the functional group and the Proposed Offshore Scheme would not lead to a change in distribution of species. The magnitude of the impact has been assessed as negligible.

21.8.45 In conclusion the overall significance of visual and physical disturbance or displacement due to the presence of Project vessels and equipment for auks has been assessed as **Negligible** and **Not Significant**.

#### Terns, gulls, kittiwakes and gannets

21.8.46 Terns, gulls, kittiwakes and gannets are low to moderately sensitive to noise and visual disturbance.

21.8.47 Seventeen species from this functional group are known to be present within the study area including kittiwake and gannet. Kittiwakes have been categorised with a disturbance susceptibility of 2 and habitat specialisation score of 1 in MIG-Bird (2017) (Ref 41) and are considered to be low to moderately sensitive to noise and visual disturbance. Gannets have been categorised with a disturbance susceptibility of 2 and habitat specialisation score of 2 (Ref 41) and are considered to be low to moderately sensitive to noise and visual disturbance. It is considered that the presence of the Project vessels is unlikely to have a significant impact on this group. The sensitivity of the functional group to the impact has been assessed as low.

21.8.48 Construction would progress in a linear manner along the draft Order Limits over a 36-month period. Disturbance and displacement impacts would be temporary and reversible with individuals able to return once vessels have passed through. There would be no permanent barrier to accessing foraging, loafing and resting areas. Alternative, preferred foraging areas are available in the wider region for the functional group and the Proposed Offshore Scheme would not lead to a change in distribution of species. The magnitude of the impact has been assessed as negligible.

21.8.49 In conclusion the overall significance of visual and physical disturbance or displacement due to the presence of Project vessels and equipment for terns, gulls, kittiwakes and gannets has been assessed as **Negligible** and **Not Significant**.

#### Waders and harriers

21.8.50 Waders are known to be sensitive to visual disturbance from vessel traffic, but in general there is more habituation to disturbance than species such as divers and seaducks as noted in Atterbury et al (2021) (Ref 44). Waders and harriers are note noted within the MIG 2022 for disturbance suscept ability or habitat specialisation.

21.8.51 Twenty-two species from this functional group are known to be present within the study area. Wader species are considered to be sensitive to noise and visual disturbance (Ref 44). They are present within the intertidal area rather than offshore. No works would be undertaken in the intertidal area as a result of the Proposed Offshore Scheme. The HDD would exit below the mean low water mark. It is not considered that the presence of the Project vessels is likely to have a significant impact on this group. The sensitivity of the functional group to the impact has been assessed as low.

21.8.52 Vessels used for construction of the Proposed Offshore Scheme would be slow moving in the nearshore and would take place in the context of existing sources of disturbance from recreational vessels, and public use of the intertidal area. Disturbance and displacement impacts would be temporary and reversible with individuals able to return once vessels have moved out of the nearshore. There would be no permanent barrier to accessing foraging, loafing and resting areas. Alternative, preferred foraging areas are available in the wider region for the functional group and the Proposed Offshore Scheme would not lead to a change in distribution of species. The magnitude of the impact has been assessed as negligible.

21.8.53 In conclusion the overall significance of visual and physical disturbance or displacement due to the presence of Project vessels and equipment has been assessed as **Negligible and Not Significant**.

### Temporary increase and re-deposition of suspended sediments

21.8.54 This impact relates to changes in water clarity (or turbidity) due to changes in suspended sediment concentrations (SSC). Sediment re-suspension is created by activities that penetrate the seabed or that abrade surface layers. This would include construction activities such as seabed preparation works (including pre-sweeping of sand waves) and cable burial. The SSCs at a particular location depend on the activity, hydrological conditions and the sediment particle size distribution.

21.8.55 Pre-sweeping of sandwaves will be required within the Outer Thames Estuary SPA as part of seabed preparation for the Proposed Offshore Scheme for

approximately 2.1 km. Although several activities will create minor elevations in suspended sediment concentrations, cable burial and pre-sweeping of sand waves would cause the largest temporary sediment plume. Numerical sediment dispersion modelling was undertaken for cable burial and pre sweeping and is presented in **Appendix 18.1 Sediment modelling report** of this PEIR. As the Proposed Offshore Scheme overlaps the Outer Thames Estuary SPA (which covers an area of 3,924km$^2$) for approximately 21 km, there may be a direct impact on species within the Outer Thames Estuary SPA, further information on this can be found in **paragraph 21.8.41**.

21.8.56 **Chapter 18 Marine Physical Environment** of this PEIR estimates suspended sediment concentration (SSC) of more than 5mg/l are constrained within the study area and are short lived (generally occurring for less than 2.4 hours). The only exception is associated with cable burial between KP5 and KP10 where increases in SSC of up to 15mg/l extend to 1.5km to the north of the study area, this is a result of the higher percentage of fines in this area and the alignment of the Draft Order Limits with the flow direction.

21.8.57 Certain diving species (such as terns and red-throated diver) are sensitive to changes in water clarity. These species in general are visual foraging birds, which rely on clear water to identify and catch potential prey (Ref 280). The preliminary assessment below considers the significance of the impact on the key functional groups likely to be affected.

### Outer Thames Estuary SPA

21.8.58 Sections of the Draft Order Limits where pre-sweeping could be required within or in close proximity (within 2km) to the Outer Thames Estuary SPA include KP14 to KP26, KP34 to KP36, KP42.5 to KP43.5 and KP55 to KP59. While The model did not simulate the sediment disturbance from pre-sweeping in this section of the Draft Order Limits. Flows in the OTE SPA are generally similar to those in areas where pre-sweeping were modelled. However the sediment volumes needing pre-sweeping are expected to be lower than in other modelled locations due to the presence of smaller bedforms. The modelling results can therefore be used to predict the maximum extent, magnitude and duration of impact within the SPA, with increases of more than 5mg/l only persisting for the order of hours. Similarly, increases in SSC from cable burial were only predicted to exceed 5mg/l for a short duration (less than seven hours).

21.8.59 Approximately 20% of the Outer Thames Estuary SPA (only considering the North Inshore and North Offshore areas) is predicted to be affected by an increase in SSC of more than 5mg/l during the construction of the Proposed Offshore Scheme, with the largest impact from cable burial at the slower installation rate of 100m/hour. The area predicted to be impacted at any one time is much smaller, being less than 0.1% of the SPA areas which intersect the Draft Order Limits. The duration of time where SSC is increased by more than 5mg/l at any point within the Outer Thames Estuary SPA is 18 days, although the duration

of time exceeded at any one point is much less than this (order of hours). **Chapter 18 Marine Physical Environment** of this PEIR established that SSCs close to shore can naturally reach 47mg/l and therefore given the short duration of elevated SSCs related to the marine activities the magnitude of the impact has been assessed as negligible.

21.8.60 Cook and Burton (2010) (Ref 230) assess little tern to be highly vulnerable to changes in turbidity as vision plays an important role in the species' foraging capability. A report by Brenninkmeijer et al. (2002) (Ref 234) states that the food intake rate for little tern and Sandwich tern was lower in the most turbid waters compared to clearer waters at their study site in West Africa. Whilst they have a high sensitivity to the impact, the baseline established that the Draft Order Limits are not a preferred foraging area for the designated tern species within the Outer Thames SPA.

21.8.61 As the baseline assessment indicates that the tern receptors have alternative foraging areas within the Outer Thames Estuary SPA, the sensitivity of little tern and Sandwich tern receptors has been assessed as low.

21.8.62 The red-throated diver is also thought to be sensitive to temporary changes in SSCs. Natural England's Advice on Operations and Maintenance (Ref 267) gives a sensitivity score of 'medium' (note that Natural England state within their advice note that the confidence level of this assessment is low). Although there is the potential for red-throated divers to be impacted by change in water clarity there is limited specific information available.

21.8.63 The baseline established that the Draft Order Limits within the Outer Thames Estuary SPA are not a preferred foraging area for red-throated diver. Whilst high counts of individuals are noted, the key hot spots for individuals are towards the south where density estimates are higher as illustrated in **Figure 21.10** of this PEIR.

21.8.64 As the baseline indicates that the red-throated diver features have alternative, preferred foraging areas within the Outer Thames Estuary SPA and their use of the Draft Order Limits within the Outer Thames Estuary SPA is therefore the magnitude has been assessed as low, the sensitivity of the red-throated diver has been assessed as low.

21.8.65 In conclusion, during construction, the effect of temporary increase and deposition of suspended sediment has been assessed as **Negligible** and **Not Significant**

Divers, grebes and mergansers and seaducks, geese and swans

21.8.66 Certain sea ducks, divers, grebes and mergansers are thought to be sensitive to temporary changes in SSCs due to their reliance on underwater visibility for foraging. Species such as red-throated divers, little grebe, tufted duck and pochard dive for prey and rely on clear vision for success. A reduction in water clarity as a result of increased suspended solid concentrations in the water

column following disturbance of seabed sediments (i.e., as a result of route clearance, seabed preparation, cable burial, deposition of external cable protection), could negatively impact foraging success.

21.8.67 Species generally forage in shallow waters over sandy or muddy seabeds or in rocky areas. The foraging ranges for these species are between approximately 9km and 33km from the coastline (Ref 18), suggesting that they are unlikely to be present within the majority of the Draft Order Limits. The Proposed Offshore Scheme is largely sited offshore >35km from the coastline; only the first 37.8km of the Draft Order Limits are within the foraging range. The area of the Draft Order Limits within the foraging range is approximately 18.9km$^2$, of a total area of the DOL 96.7km$^2$ which is equivalent to 19.5% of the overall Draft Order Limits.

21.8.68 Within **Chapter 18 Marine Physical Environment** of this PEIR, there is modelled evidence that any sediment plumes will be rapidly dissipated as result of natural current flow, with increases of more than 5mg/l only persisting for the order of hours, with this elevation in places being within the natural variability observed with the background levels of SSCs. The magnitude of the impact for seaducks, divers, grebes and mergansers has been assessed as negligible. Natural England's benchmark for the impact based on their Advice on Operations and Maintenance for the Greater Wash SPA, Exe Estuary SPA and Falmouth Bay to St Austell SPA is "a change in one WFD ecological status class for one year within the site." A temporary increase in suspended sediments could occur on multiple occasions during construction. However, on each occasion, the change would be for a short period (days rather than weeks), with SSCs rapidly reducing once the activity ceases. The impact benchmark would not be reached.

21.8.69 Diving birds have sufficient alternative feeding grounds and prey species available and therefore the sensitivity of the group has been assessed as low.

21.8.70 In conclusion, during construction, the significance of the effect of the temporary increase and deposition of suspended sediment on divers, grebes and mergansers has been assessed as **Negligible** and **Not Significant**.

### Auks

21.8.71 Auks feed on pelagic and demersal fish in the water column (Ref 44). Therefore, there is potential for an adverse impact on their foraging abilities as a result of decreased water clarity due to increased SSC in the water column following disturbance of seabed sediments (i.e., as a result of route clearance, seabed preparation, cable burial, deposition of external cable protection).

21.8.72 Auks have been observed during the LionLink inshore and beach breeding bird survey in 2024-2023 and Wintering bird survey 2023/24 though they are not qualifying features of any nearby designated sites. Within **Chapter 18 Marine Physical Environment** of this PEIR, there is evidence that any sediment plumes will be rapidly dissipated as result of natural current flow, with increases of more than 5mg/l only persisting for the order of hours. Natural England's benchmark

for the impact is "a change in one WFD ecological status class for one year within the site." A temporary increase in suspended sediments could occur on multiple occasions during construction, operation and maintenance, and decommissioning. However, on each occasion, the change would be for a short period (days rather than weeks), with SSCs rapidly reducing once the activity ceases. The impact benchmark would not be reached. Therefore, the magnitude of the impact has been assessed as negligible.

21.8.73 Natural England's Advice on Operations and Maintenance classify guillemot, razorbill and puffin as having medium sensitivity to a change in water clarity, noting that they are not as sensitive as divers, but more sensitive than gannet. This function group will have sufficient alternative feeding grounds and prey species available. The sensitivity has been assessed as medium for this group.

21.8.74 In conclusion the overall significance of temporary increase and re-deposition of suspended sediments for auks has been assessed as **Negligible** and **Not Significant.**

### Terns, gulls, kittiwakes and gannets

21.8.75 Seventeen different species have been identified within the study area that fall within this group. However, the sensitivity to the impact of temporary changes in suspended sediments varies between species. Natural England's Advice on Operations classify tern species as having a high sensitivity to a change in water clarity, kittiwake as medium sensitivity and gannet as low sensitivity. Sensitivity within gull species varies depending on their feeding habitats. Foraging distances range from 5 – 35km for tern species and 509km for gannet, 300km for kittiwake and from 18.5 – 236km for gull species. This suggests that different areas of the Draft Order Limits will be used by different species depending on their foraging range and the distance of the Draft Order Limits from the coastline. The higher sensitivity species (e.g., terns) are features of the SPAs within the region (and have been assessed above).

21.8.76 The assessment for the Outer Thames Estuary SPA (above) concluded that the sensitivity was low due to the baseline review indicating that the Draft Order Limits are not a preferred foraging area for the designated species of tern. As gannet also have a low sensitivity, the sensitivity for this group is therefore based on kittiwake which are likely to be present further offshore. The sensitivity has therefore been assessed as medium for this group.

21.8.77 Within **Chapter 18 Marine Physical Environment** of this PEIR, there is evidence that any sediment plumes will be rapidly dissipated as result of natural current flow, with increases of more than 5 mg/l only persisting for an order of hours. Natural England's benchmark for the impact is "a change in one WFD ecological status class for one year within the site." A temporary increase in suspended sediments could occur on multiple occasions during construction, operation and maintenance, and decommissioning. However, on each occasion, the change would be for a short period (days rather than weeks), with SSCs rapidly reducing

once the activity ceases. The impact benchmark would not be reached. The magnitude of the impact for terns, gulls, kittiwakes and gannets has been assessed as negligible.

21.8.78 In conclusion the overall significance of a temporary increase and re-deposition of suspended sediments for terns, gulls, kittiwakes and gannets has been assessed as **Negligible** and **Not Significant.**

### Changes in distribution of prey or target species

21.8.79 This preliminary assessment focuses on changes in distribution of prey or target species. This could occur as an indirect result of permanent habitat loss from the deposit of external cable protection during construction. However, other impacts on prey species such as underwater noise, temporary increase and deposition of suspended sediments and sediment heat change could also combine with temporary and permanent habitat loss to lead to a change in prey availability.

21.8.80 Marine birds feed on a variety of prey species and can travel great distances to forage. Conversely, they may also have specific habitat preferences which limit their foraging ranges. Seabirds such as gannets and auks typically forage further offshore, feeding on plankton and fish that live within the water column, whereas gulls and terns tend to remain closer to shore (Ref 269). Divers, mergansers and grebes feed on small fish in shallow inshore waters, and some diving ducks and gulls forage for benthic invertebrates such as bivalves. Fish species such as Atlantic herring (*Clupea harengus*) and sandeel (*Ammodytes spp.)* are known to be of particular importance as a prey species for a variety of marine fauna, including seabirds. Sandeel in particular are widely recognised as a critical food source for many seabirds, fish and marine mammals (Ref 270) and have been identified as the most important foraged fish in the North Sea.

21.8.81 Activities that lead to temporary or permanent habitat loss affect seabed habitats which in turn could affect the availability or distribution of prey. Significant or widespread 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 bird species in subsequent years.

21.8.82 If fish species are avoiding an area, then birds may potentially be required to travel greater distances to locate prey, leading to an energetic cost. For example, loss of a preferred prey close to breeding colonies would increase the amount of time birds are at sea foraging or lead to lower food availability for chick survival. The maintenance of supporting habitats and processes to ensure the provision of prey species for birds is therefore a key consideration in maintaining the favourable conservation status of the individual species.

21.8.83 With regards to fish and shellfish prey species, **Chapter 20 Fish and Shellfish** of this PEIR considered a number of impact pathways during construction on

marine species including herring, sandeel and shellfish. The impact pathways considered as part of the preliminary assessment include:

a. Temporary habitat loss (**paragraphs 20.8.3** to **20.8.18**)
b. Permanent habitat loss (**paragraphs 20.8.19** to **20.8.34**)
c. Temporary increase and deposition of suspended sediments (**paragraphs 20.8.35** to **20.8.51**)
d. Electromagnetic changes and barriers to species movement (**paragraphs 20.8.81** to **20.8.107**)
e. Temperature increase (**paragraphs 20.8.108** to **20.8.115**)

21.8.84 The assessment concluded that the significance of all effects on fish and shellfish receptors was either Negligible and Not Significant or Minor and Not Significant. In the absence of any environmentally significant impact on prey species, it can be concluded that there will be no discernible effect on seabird species.

21.8.85 In conclusion, the significance of the effect has been assessed as **Negligible** and **Not Significant**.

### Transboundary impacts associated with visual/physical disturbance

21.8.86 As the Proposed Offshore Scheme gets closer to the border with the Netherlands EEZ marine birds on the other side of the border will be disturbed. However, there are no Natura 2000 sites within proximity of the Proposed Offshore Scheme. The nearest sites are Bruine Bank SPA which is 42km east of the Proposed Offshore Scheme and the Friese Front SPA which is 79km northeast of the Proposed Offshore Scheme.

21.8.87 The assessment for this impact concluded it was Not Significant in the UK; as the baseline characteristics in Dutch waters immediately adjacent to the EEZ boundary are the same as in UK waters, the conclusion remains valid for the Netherlands. Transboundary impacts have been assessed as **Not Significant**.

### Transboundary impacts associated with temporary increase and re-deposition of suspended sediments

21.8.88 As a linear project, Offshore submarine HVDC cable installation activities will continue across the UK/Netherlands EEZ border into Dutch waters. The effects from marine activities in UK waters would be limited in spatial extent close to the jurisdictional boundary i.e., concentrations of suspended sediments will be exceeded across the border, but only to the same extent that sediment is travelling in UK waters – within 15km. The preliminary assessment of the impact of temporary increases and re-deposition of suspended sediments on marine birds in UK waters concluded that the effect was Not Significant. As the baseline characteristics in Dutch waters immediately adjacent to the EEZ boundary are the same as in UK waters, the conclusion remains valid for the Netherlands. Transboundary impacts have been assessed as **Not Significant**.

### Transboundary impacts associated with changes in prey availability

21.8.89 Mobile species from other European Area states that forage in UK waters could face a change in prey availability. As the preliminary assessment in **paragraph 21.8.62** concluded that the Proposed Offshore Scheme would not have a significance adverse effect on prey availability in UK waters it can be concluded that the effect on species from other states is also **Not Significant.**

### Operation and maintenance

21.8.90 The Proposed Offshore Scheme would be designed to minimise any maintenance requirements. However, the following activities may be required during the operational phase:

a. Inspection surveys;
b. Cable Repair (if required);
c. Reburial, remedial protection, or maintenance and reinstatement of external cable protection features.

21.8.91 Additional information on the Proposed Offshore Scheme operation and maintenance is provided in **Chapter 2 Description of the Proposed Scheme** of this PEIR.

21.8.92 Any operation or maintenance activities will be of a limited extent and duration. Maintenance surveys may take a couple of weeks moving in a linear fashion along the Order Limits. Repair times can vary with vessel presence required for up to several months for the duration of the repair, though in most cases duration is expected to be lower.

21.8.93 The impacts of such activities would be similar to those during construction but of a smaller magnitude and temporary duration and therefore the conclusions from construction are still applicable for operations.

21.8.94 The following conclusions reached for construction are therefore applicable:

a. Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment:
   i. Outer Thames Estuary SPA - **Moderate** and **Significant;**
   ii. Divers, grebes and mergansers – **Minor** and **Not Significant;**
   iii. Seaducks, geese and swans – **Negligible** and **Not Significant;**
   iv. Auks - **Negligible** and **Not Significant;**
   v. Terns, gulls, kittiwakes and gannets – **Negligible** and Not **Significant;**
   vi. Waders and harriers - **Negligible and Not Significant;**
b. Disturbance and displacement due to transiting vessels
   i. Outer Thames Estuary SPA - **Minor** and **Not Significant;**
c. Temporary increase and re-deposition of suspended sediments;
   i. Outer Thames Estuary SPA – **Negligible** and **Not Significant;**
   ii. Divers, grebes and mergansers – **Negligible** and **Not Significant;**
   iii. Seaducks, geese and swans – **Negligible** and **Not Significant;**
   iv. Auks - **Negligible** and **Not Significant**;

v. Terns, gulls, kittiwakes and gannets – **Negligible** and **Not Significant;**

d. Changes in distribution of prey species due to disturbance or physical displacement – **Negligible** and **Not Significant;**
e. Transboundary impacts associated with visual/physical disturbance - **Negligible** and **Not Significant**;
f. Transboundary impacts associated with changes in prey availability - **Negligible** and **Not Significant;**
g. Transboundary impacts associated with temporary increase and re-deposition of suspended sediments - **Negligible** and **Not Significant;**

### Decommissioning

21.8.95 The Proposed Scheme is expected to have a life span of 40 years. If decommissioning requires cessation of operation and removal of visible infrastructure at this point, then activities and effects associated with the decommissioning phase are expected to be no worse than during construction; and with the removal of visible infrastructure, effects would reduce over the course of that period. The Proposed Scheme 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. The following conclusions reached for construction are therefore applicable.

a. Visual/physical disturbance or displacement as a result of the presence of the project vessels and equipment:
   i. Outer Thames Estuary SPA - **Moderate** and **Significant;**
   ii. Divers, grebes and mergansers – **Minor** and **Not Significant;**
   iii. Seaducks, geese and swans – **Negligible** and **Not Significant**;
   iv. Auks - **Negligible** and **Not Significant;**
   v. Terns, gulls, kittiwakes and gannets – **Negligible** and **Not Significant;**
   vi. Waders and harriers - **Negligible** and **Not Significant;**
b. Disturbance and displacement due to transiting vessels
   i. Outer Thames Estuary SPA - **Minor** and **Not Significant;**
c. Temporary increase and re-deposition of suspended sediments;
   i. Outer Thames Estuary SPA - **Negligible** and **Not Significant;**
   ii. Divers, grebes and mergansers – **Negligible** and **Not Significant;**
   iii. Seaducks, geese and swans – **Negligible** and **Not Significant;**
   iv. Auks - **Negligible** and **Not Significant;**
   v. Terns, gulls, kittiwakes and gannets – **Negligible** and **Not Significant;**
d. Changes in distribution of prey species due to disturbance or physical displacement – **Negligible** and **Not Significant;**
e. Transboundary impacts associated with visual/physical disturbance - **Negligible** and **Not Significant;**
f. Transboundary impacts associated with changes in prey availability - **Negligible** and **Not Significant**; and

g. Transboundary impacts associated with temporary increase and re-deposition of suspended sediments - **Negligible** and **Not Significant**

## 21.9 Mitigation, monitoring and enhancement

21.9.1 Mitigation measures are defined in **Chapter 5 EIA Approach and Methodology** of this PEIR, with embedded control measures for intertidal and offshore ornithology being presented in **Section 21.7** of this chapter.

### Additional mitigation

21.9.2 The preliminary assessment has concluded that the Proposed Offshore Scheme alone would have a Significant adverse effect on red-throated diver if HDD enabling works and cable pull-in were undertaken during the winter months due to the number of vessels present and the length of the activity. The Applicant has committed to control measures which form part of "Natural England's Best Practice Protocol for Vessels in Red-Throated Diver SPAs" (Ref 43) i.e., Commitment Reference Codes OC11 and OC40. Further additional measures for specific high-risk activities (HDD enabling works and cable pull-in) within the Outer Thames Estuary SPA would be discussed with statutory consultees and detailed as part of the ES.

### Monitoring

21.9.3 There are no likely significant adverse effects related to the intertidal and offshore ornithology assessment identified either during construction, operation and maintenance, or decommissioning stages of the Proposed Offshore Scheme that require monitoring.

## 21.10 Summary of residual effects

21.10.1 The preliminary assessment has concluded that for the following impacts no significant effects on intertidal and offshore ornithology are expected from the Proposed Offshore Scheme alone during construction, operation and maintenance, and decommissioning, provided design and control measures are implemented. No additional mitigation has been proposed at this stage.

a. Temporary increase and re-deposition of suspended sediments;
b. Changes in distribution of prey species due to disturbance or physical displacement;
c. Transboundary impacts associated with visual/physical disturbance;
d. Transboundary impacts associated with changes in prey availability;
e. Transboundary impacts associated with temporary increase and re-deposition of suspended sediments.

21.10.2 The assessment presented in **paragraphs 21.8.9** to **21.8.12** has concluded that there would be a moderate adverse significant effect on red-throated diver within the Outer Thames Estuary SPA during winter (November to March inclusive) due

to disturbance and displacement if HDD enabling works and cable pull-in were undertaken. The effect would be temporary, restricted to when a vessel or vessels were present within the designated site for greater than two days, with no residual effects once the vessel(s) transited out of the designated site. The Applicant has committed to control measures which form part of "Natural England's Best Practice Protocol for Vessels in Red-Throated Diver SPAs" (Ref 43) i.e., Commitment Reference Codes OC11 and OC40. Further additional measures would be detailed as part of the ES as outlined in **Section 21.9**. For all other species no significant adverse residual effects are predicted.

# Topic Abbreviations

| Term | Definition |
|---|---|
| BTO | British Trust for Ornithology |
| CEMP | Construction Environmental Management Plan |
| DCO | Development Consent Order |
| DML | Deemed Marine License |
| DLO | Draft order limits |
| DSG | Divers, grebes and mergansers (function group) |
| EIA | Environmental Impact Assessment |
| ESRP | Emergency Spill Response Plan |
| ES | Environmental Statement |
| EEZ | Exclusive Economic Zones |
| HDD | Horizontal Directional Drilling |
| HRA | Habitats Regulations Assessment |
| HVDC | High voltage Direct Current |
| IUCN | The International Convention for the Conservation of Nature |
| JNCC | Joint Nature Conservation Committee |
| $Km^2$ | Kilometres squared |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MCAA | Marine and Coastal Access Act |
| MHWS | Mean high-water springs |
| MMO | Marine Management Organisation |
| MPCP | Marine Pollution Contingency Plan |
| NE | Natural England |
| NERC | Natural Environment and Rural Communities |
| NM | Nautical Mile |
| NPS | National Policy Statement |
| ODPM | Office of the Deputy Prime Minister |
| OESEA | UK Offshore Energy Strategic Environmental Assessment |
| OWF | Offshore Windfarm |
| PEIR | Preliminary Environmental Information Report |
| RSPB | Royal Society for the Protection of Birds |
| SAC | Special Area of Conservation |
| SGS | Seaducks, geese and swans (function group) |

| Term | Definition |
|---|---|
| SNCB | Statutory Nature Conservation Bodies |
| SNH | Scottish Natural Heritage |
| SOLAS | International Convention for the Safety of Life at Sea |
| SOPEP | Shipboard Oil Pollution Emergency Plan |
| SPA | Special Protection Areas |
| SSSI | Sites of Special Scientific Interest |
| TGKG | Terns, gulls, kittiwakes and gannets (function group) |
| UK BAP | Terns, gulls, kittiwakes and gannets (function group) |
| VP | Vantage point |
| WeBS | Wetland Bird Survey |
| WH | Waders and harriers (function group) |

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