The Great Grid Upgrade

Sea Link

Sea Link

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Version History			
Date	**Issue**	**Status**	**Description / Changes**
March 2025	A	Final	For DCO submission
September 2025	B	Final	Update to reflect S89(3) Procedural Decision from the Examining Authority
December 2025	C	Final	Amended following Relevant Representations and Issue Specific Hearing 1 for Deadline 2
April 2026	D	Final	Updated in response to NE Comments and ExQ2s.
April 2026	E	Final	Issued to PINS Deadline 7

5. Marine Ornithology

5.1 Introduction

5.1.1 This chapter of the Environmental Statement (ES) presents the assessment of the likely significant effects to birds that could result from the Proposed Project (as described in **Application Document 6.2.1.4 Part 1 Chapter 4 Description of the Proposed Project**).

5.1.2 This chapter describes the methodology used, the datasets that have informed the assessment, baseline conditions, mitigation measures and any residual significant effects to birds that could result from the Proposed Project.

5.1.3 The Order Limits, which illustrate the boundary of the Proposed Project and the Offshore Scheme Boundary, are illustrated on **Application Document 2.2.1 Overall Location.** This chapter assesses the potential impacts associated with elements of the Offshore Scheme carried out in the marine environment, i.e., below Mean High water Spring (MHWS). The Offshore Scheme does include up to where the marine HVDC cables transition to the underground HVDC cables at the transition joint bay (TJB), in land from the coast at the landfall locations in Suffolk and Kent. However, both the Suffolk and Kent landfalls will be installed by trenchless solutions (such as Horizontal Directional Drill (HDD), Direct Pipe or micro-tunneling) at a depth of 15 and 20 m below the seabed. At the Suffolk landfall, the trenchless techniques will be in the transition zone between the onshore and offshore elements, with the entry/exit points located entirely in the subtidal environment, and therefore avoiding the intertidal environment. At the Kent landfall, trenchless techniques will be employed with the entry/exit points located within mudflats in the intertidal environment and passing beneath the upper reaches of the intertidal zone to avoid areas of saltmarsh and lagoon. Elements of these works above MHWS are considered in the relevant chapters of the Onshore Scheme.

5.1.4 This chapter should be read in conjunction with:

- **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project;**
- **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology;**
- **Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping Opinion and EIA Consultation;**
- **Application Document 6.2.2.3 Part 2 Suffolk Chapter 3 Ecology and Biodiversity;**
- **Application Document 6.2.3.3 Part 2 Kent Chapter 2 Ecology and Biodiversity;**
- **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology;**
- **Application Document 6.2.4.7 Part 4 Marine Chapter 7 Shipping and Navigation;**

- **Application Document 6.6 Habitats Regulations Assessment Report**;
- **Application Document 7.5.2 Offshore Construction Environmental Management Plan**;
- **Application Document 7.8 Red Throated Diver Protocol**;
- **Application Document 9.92 Outline Cable Specification and Installation Plan**; and
- **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**.

5.1.5 This chapter is supported by the following figures:

- **Application Document 6.4.4.5 ES Figures Marine Ornithology.**

5.1.6 This chapter is supported by the following appendices:

- **Application Document 6.3.2.2.B Appendix 2.2.B Suffolk Wintering Birds 2022-23 and 2023-2024;**
- **Application Document 6.3.2.2.C Appendix 2.2.C Suffolk Breeding Birds 2023 and 2024;**
- **Application Document 6.3.3.2.B Appendix 3.2.B Kent Wintering Birds 2022-2023;**
- **Application Document 6.3.3.2.C Appendix 3.2.C Kent Wintering Birds 2023-24**;
- **Application Document 6.3.3.2.D Appendix 3.2.D Kent Breeding Birds 2023;** and
- **Application Document 6.3.3.2.E Appendix 3.2.E Kent Breeding Birds 2024.**

5.2 Regulatory and Planning Context

5.2.1 This section sets out the legislation and planning policy that is relevant to the marine ornithology assessment. A full review of compliance with relevant national and local planning policy is provided within the Planning Statement submitted as part of the application for Development Consent.

5.2.2 Policy generally seeks to avoid or minimise adverse effects to birds from development. This applies particularly to sites designated for their ornithological importance, including Special Protection Areas (SPAs), Ramsar sites, and Sites of Special Scientific Interest (SSSIs), as well as habitats outside of these sites that may be integral to the survival of a species associated with a designated site.

Legislation

Marine and Coastal Access Act 2009

5.2.3 The Marine and Coastal Access Act 2009 (HM Government, Marine and Coastal Access Act, 2009) provides the legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas. The act makes provisions for the designation of Marine Conservation Zones for the purpose of conserving marine flora and fauna (including birds) and marine habitats and protected features. This includes conserving species which are rare or threatened.

The Wildlife and Countryside Act 1981

5.2.4 The Wildlife and Countryside Act 1981 (HM Government, 1981) (as amended) includes provisions relating to nature conservation. It aims to limit and/or prohibit activities which could adversely impact wild birds, their nests and eggs, including any activity which:

- intentionally kills, injures or takes any wild bird;
- takes, damages or destroys the nest of a wild bird included in Schedule ZA1;
- takes, damages or destroys the nest of any wild bird while that nest is in use or being built;
- obstructs or prevents any wild bird from using its nest;
- takes or destroys an egg of any wild bird;
- disturbs any wild bird included on Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; and
- disturbs dependent young of such a bird.

Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006

5.2.5 Section 41 of the NERC 2006 (HM Government, 2006) imposes a requirement on the Secretary of State to publish a list of species and habitats of principal importance for the purpose of conservation of biodiversity. The conservation of biodiversity may include the enhancement, restoration or protection of populations and habitats.

The Countryside and Rights of Way (CRoW) Act 2000 (as amended)

5.2.6 The CRoW Act 2000 (as amended) (HM Government, 2000) normally gives a public right of access to land mapped as 'open country' (mountain, moor, heath and down) or registered common land.

Environment Act 2021

5.2.7 The Environment Act 2021 (HM Government, 2021) sets clear statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity, water, and waste, and includes the introduction of statutory requirements relating to Biodiversity Net Gain (BNG).

The Conservation of Habitats and Species Regulations 2017 (amended 2019)

5.2.8 The Conservation of Habitats and Species Regulations 2017 (HM Government, 2017) (amended 2019 (HM Government, 2019)) as retained EU law are amended to incorporate the Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) on 31 December 2020 into UK legislation out to the 12 nautical mile (NM) limit. The regulations cover both England and Wales. The amendments in 2019 involved transferring the functions from the European Commission to relevant English and Welsh authorities. The 2017 regulations included the classification, and registration of, SPAs for birds. The 2019 changes to the regulations made provisions for the creation of a national site network in the UK which comprised of the sites in both inshore and offshore marine areas of the UK which were already designated under the European Union's Natura 2000 network (including SPAs), and new sites designated under the updated regulations. Management objectives for the national site network were also established.

The Conservation of Offshore Marine Habitats and Species Regulations 2017

5.2.9 The Conservation of Offshore Marine Habitats and Species Regulations 2017 (HM Government, 2017) as retained EU law are amended to incorporate the Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) on 31 December 2020, and applies within the UK Offshore Marine Area (beyond the 12 NM limit). It provides the legal mechanism for implementing protection requirements for habitats and species, including the designation of protected sites in the offshore environment and the management of such sites.

The Marine Strategy Regulations 2010

5.2.10 The Marine Strategy Regulations 2010 (HM Government, 2010) originally implemented the Marine Strategy Framework Directive (2008/56/EC) into UK legislation. At the end of the Brexit transition period, the Marine Strategy Regulations 2010 became retained EU law. The regulations require a marine strategy to be produced for all UK waters, which aims to protect and preserve the marine environment by preventing deterioration and restoring marine ecosystems which have been adversely affected. This includes preventing inputs such as pollution into the marine environment and managing human activities to avoid significant adverse impacts.

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive)

5.2.11 The Birds Directive (HM Government, 2009) was incorporated as at 31 December 2020 into the Conservation of Habitats and Species Regulations 2017 (HM Government, 2017) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (HM Government, 2017) as retained EU law. The Directive concerns the conservation of naturally occurring wild birds in the European Member States to which the Treaty applies. This includes the prohibition of deliberate killing or capture by any method, deliberate destruction of, or damage to, their nests and eggs or removal of their nests, taking their eggs in the wild and keeping these eggs even if empty, deliberate disturbance of these birds particularly during the period of breeding and rearing, in so far as disturbance would be significant having regard to the objectives of this Directive, and keeping birds of species the hunting and capture of which is prohibited.

National Policy

National Policy Statements

5.2.12 National Policy Statements (NPS) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. Table 5.1, Table 5.2 and Table 5.3 below provides details of the elements of NPS for Energy (EN-1) (Department for Energy Security and Net Zero, 2023a) NPS for Renewable Energy Infrastructure (EN-3) (Department for Energy Security and Net Zero, 2023b) and NPS for Electricity Networks Infrastructure (EN-5) (Department Energy Security and Net Zero, 2023c) that are relevant to this chapter.

Table 5.1 NPS EN-1 requirements relevant to marine ornithology

NPS EN-1 section	Where this is covered in the ES
4.5.7…"*Applicants are encouraged to approach the marine licensing regulator (MMO in England and Natural Resources Wales in Wales) in pre-application, to ensure that they are aware of any needs for additional marine licenses alongside their Development Consent Order application*".	Contact and engagement with the Marine Management Organisation (MMO) has been ongoing and a record of consultation is provided in Section 5.3. Consultation with Natural England has also been ongoing. Relevant comments are provided in Section 5.3.
4.5.8…"*Applicants for a Development Consent Order must take account of any relevant Marine Plans and are expected to complete a Marine Plan assessment as part of their project development, using this information to support an application for development consent*".	Relevant marine Plans are identified in Table 5.5 and considered in Section 5.9.
4.5.9…"*Applicants are encouraged to refer to Marine Plans at an early stage, such as in pre-application, to inform project planning, for example to avoid less favourable locations as a result of other uses or environmental constraints".*	Relevant marine Plans are identified in Table 5.5 and considered in Section 5.9.
5.4.17…*"Where the development is subject to EIA, the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance (including those outside England), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats".*	Relevant internationally, nationally and locally designated sites of importance for birds, as well as bird species identified as being of principal importance in the Study Area are described in Section 5.7.
5.4.19…*"The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests".*	Several measures have been put in place, including seasonal restrictions, to conserve birds. These are provided in Section 5.8.
5.4.35…"*Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development*".	Appropriate avoidance and mitigation measures are included in section 5.8. Compensation and enhancement measures for the Onshore Schemes have been considered in **Application Document 6.12 Environmental Gain Report**.
5.4.22…"The design of energy NSIP proposals will need to consider the movement of mobile/migratory species such as birds…..and their potential to interact with infrastructure. As energy infrastructure could occur anywhere within England and Wales, both inland and onshore and	The effect of the Proposed Project on bird species have been considered in detail in Section 5.9.

NPS EN-1 section	Where this is covered in the ES
offshore, the potential to affect mobile and migratory species across the UK….requires consideration" more widely across Europe (transboundary effects) requires consideration, depending on the location of development.	

Table 5.2 NPS EN-3 requirements relevant to marine ornithology

NPS EN-3 section	Where this is covered in the ES
2.8.101…*"Applicants must undertake a detailed assessment of the offshore ecological, biodiversity and physical impacts of their proposed development, for all phases of the lifespan of that development, in accordance with the appropriate policy for offshore wind farm EIAs, HRAs and MCZ assessments"*	A detailed assessment of impacts on ornithological features throughout the lifespan of the Proposed Project has been provided in Section 5.9. Whilst consideration has been given to appropriate policy for offshore wind farm EIAs, this has only been applied where the impacts are specifically relatable to the Proposed Project e.g., cable laying elements of offshore wind farm development.
2.8.104…"Applicants should consult at an early stage of pre-application with relevant statutory consultees and energy not-for profit organisations/non governmental organisations as appropriate, on the assessment methodologies, baseline data collection, and potential avoidance, mitigation and compensation options which should be undertaken".	Consultation has been undertaken with relevant consultees. Points raised which are of relevance to ornithological features are provided in Section 5.3.
2.8.119…"Applicant assessment of the effects of installing offshore transmission infrastructure across the intertidal/coastal zone should demonstrate compliance with mitigation measures in any relevant plan-level HRA including those prepared by The Crown Estate as part of its leasing round, and include information, where relevant, about: • any alternative landfall sites that have been considered by the applicant during the design phase and an explanation for the final choice; • any alternative cable installation methods that have been considered by the applicant during the design phase and an explanation for the final choice; • potential loss of habitat; • disturbance during cable installation, maintenance/repairs and removal (decommissioning); • increased suspended sediment loads in the intertidal zone during installation	The effects of the Proposed Project have been assessed in detail in Section 5.9. Options considered for landfall sites and cable installation methods are described in **Application Document 6.2.1.4 Chapter 4 Description of the Proposed Project**.

NPS EN-3 section	Where this is covered in the ES
and maintenance/repairs; • potential risk from invasive and non-native species; • predicted rates at which the intertidal zone might recover from temporary effects, based on existing monitoring data; and • protected sites".	
2.8.240….. "Aviation and navigation lighting should be minimised and/or on demand (as encouraged in EN-1 Section 5.5) to avoid attracting birds, taking into account impacts on safety"	All use of artificial lighting during construction will be directed and only used in the vicinity of the work area. Potential impacts to birds are discussed in Section 5.9.
2.8.242… *"Construction vessels and post-construction maintenance vessel traffic associated with offshore wind farms and offshore transmission should, where practicable and compatible with operational requirements and navigational safety, avoid rafting seabirds during sensitive periods and follow agreed navigation routes to and from the site and minimise the number of vessels movements overall".*	Mitigation measures to be followed by vessels in order to mitigate against disturbance of birds are provided in Section 5.8.

Table 5.3 NPS EN-5 requirements relevant to marine ornithology

NPS EN-5 section	Where this is covered in the ES
2.2.10 "...*As well as having duties under Section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), applicants must take into account Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest … and …do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects".*	Impact assessments have been completed in detail in Section 5.9 to ensure the conservation of ornithological features. Mitigation measures, where required, have also been considered and are provided in Section 5.8.
2.13.21 *"…The sensitivities of many coastal locations and of the marine environment as well as the potential environmental, community and other impacts in neighbouring onshore areas must be considered in the identification onshore connection points."*	Sensitivities of ornithological features at the landfall sites have been considered in Section 5.9.
2.14.2...(Part) "*In the assessments of their designs, applicants should demonstrate how environmental, community and other impacts have been considered and*	Full assessments of impacts on ornithological features have been provided in Section 5.9.

NPS EN-5 section	Where this is covered in the ES
how adverse impacts have followed the mitigation hierarchy i.e. avoidance, reduction and mitigation of adverse impacts through good design; how the mitigation hierarchy has been followed, in particular to avoid the need for compensatory measures for coastal, inshore and offshore developments affecting SACs SPAs, and Ramsar sites".	Mitigation measures have also been considered in Section 5.8.

National Planning Policy Framework

5.2.13 The National Planning Policy Framework (NPPF) as revised in December 2024 (Ministry for Levelling Up, Housing and Communities, 2024) sets out national planning policies that reflect priorities of the Government for operation of the planning system and the economic, social, and environmental aspects of the development and use of land. The NPPF has a strong emphasis on sustainable development, with a presumption in favour of such development. The NPPF has the potential to be considered important and relevant to the Secretary of State consideration of the Proposed Project.

5.2.14 The latest draft NPFF (2024) which has recently been issued for consultation has been reviewed for updates to any of the relevant information considered below.

5.2.15 Table 5.4 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the ES.

Table 5.4 NPPF requirements relevant to marine ornithology

NPPF section	Where this is covered in the ES
Paragraph 187 "*Planning policies and decisions should contribute to and enhance the natural and local environment by [inter alia] … protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); … [and] recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services; … [and] minimising impacts on and providing net gains for biodiversity; …[and] preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability*".	Measures in place to prevent significant adverse effects to birds are presented in Section 5.8.
Paragraph 188 *"Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or*	Sites designated for their ornithological importance have been described in Section 5.7.

NPPF section	Where this is covered in the ES
amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries".	
Paragraph 192 *"To protect and enhance biodiversity and geodiversity, plans should: Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; [and] promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."*	The ornithological baseline is provided in Section 5.7.
Paragraph 193 *"When determining planning applications, local planning authorities should apply the following principles: if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; [and] development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; [and] development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate."*	A full, detailed assessment of Project-related effects on birds, and mitigation measures, where required, are presented in Sections 5.8 and 5.9.
Paragraph 194 *"The following should be given the same protection as habitats sites: possible Special Areas of Conservation; [and] listed or proposed Ramsar sites; [and] sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special*	There are no possible, potential or proposed designated sites in place for the protection of birds in the Study Area.

NPPF section	Where this is covered in the ES
Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites."	All established designated sites with ornithological qualifying features are presented in Section 5.7. Further information on designated sites can be found in **Application Document 6.6 Habitats Regulations Assessment Report**.

National Planning Practice Guidance

5.2.16 This chapter has also followed National Planning Practice Guidance for the Natural Environment (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2016), which describes how biodiversity and ecosystems should be taken into account, for the purpose of conserving biodiversity. The chapter follows guidance on evidence required, such as location of designated sites and the distribution and consideration of protected and priority species. In addition, guidance has been followed around applying policy to avoid, mitigate or compensate for significant harm to biodiversity, to ensure that Proposed Project impacts do not cause significant adverse effects to birds, where possible.

Marine Planning Policy

5.2.17 The following marine plans are relevant to marine ornithology and have informed the assessment of effects in this chapter:

- The UK Marine Policy Statement (MPS), which was adopted in 2011 and provides the policy framework for the preparation of marine plans and establishes how decisions affecting the marine area should be made (HM Government, 2011);
- East Inshore and East Offshore Marine Plan (HM Government, 2014); and
- South East Inshore Marine Plan (HM Government, 2021).

Table 5.5 Marine Planning Policies relevant to marine ornithology

Marine Plan	Where this is covered in the ES
The UK MPS ensures that marine resources are used in a sustainable way by ensuring biodiversity is protected and conserved by using the precautionary principle and relying on sound evidence.	In line with policy objectives in the MPS, this ES chapter has considered measures that can be taken to avoid biodiversity loss, and has attached appropriate weight to the designated sites (SPAs, Ramsar sites and SSSIs) that are at risk of impact from the Proposed Project (Section 5.9). Species of principal importance have also been considered, in addition to those which are

Marine Plan	Where this is covered in the ES
	qualifying features of the sites listed in Section 5.7.
East Inshore and East Offshore Marine Plan ensures biodiversity is protected and conserved between Flamborough Head and Felixstowe.	This plan area supports large numbers of seabirds and waterbirds in both inshore and offshore waters. Several policies in the East Inshore and East Offshore Marine Plan, and the South East Inshore Marine Plan, relate to biodiversity, and state that proposals occurring within important marine habitat, or with the potential to cause significant adverse impacts to important habitat, should avoid, minimise and mitigate adverse impacts so that they are no longer significant. All impacts to birds associated with the Offshore Scheme have been assessed in Section 5.9, with embedded mitigation and additional mitigation measures in place being described in Section 5.8.
South East Inshore Marine Plan ensures biodiversity is protected and conserved between Felixstowe and Dover.	

Local Planning Policy

5.2.18 The intertidal area of the Offshore Scheme lies within the jurisdiction of Suffolk County Council, East Suffolk Council, Suffolk Coastal Local Plan, Kent County Council and within the boundary of Thanet District Council Local Plan and Dover District Local Plan.

5.3 Scoping Opinion and Consultation

Scoping

5.3.1 A Scoping Report (National Grid, 2022) for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 and a Scoping Opinion (The Planning Inspectorate, 2022) was received from the SoS on 1 December 2022 (**Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping Opinion and EIA Consultation).** Table 5.6 sets out the comments raised in the Scoping Opinion and how these have been addressed in this ES. The Scoping Opinion takes account of responses from prescribed consultees as appropriate. **Application Document 6.2.1.6 Part 1 Introduction Chapter 6 Scoping Opinion and EIA Consultation** provides responses to the comments made by the prescribed consultees at scoping stage and how each comment has been considered.

Table 5.6 Comments raised in the Scoping Opinion

Consultee	Comment	Response
Planning Inspectorate 5.5.1	The Scoping Report seeks to scope out this matter [*leaks and spills from vessels*] on the grounds that the measures contained in the CoCP would make the risk of accidental spills/leaks negligible. The Inspectorate agrees	The impacts from leaks and spills from vessels have been scoped out and are not considered further within Section 5.9. A list of

Consultee	Comment	Response
	that, provided the measures to mitigate the risks of leaks and spills are clearly described in the ES and secured in the draft DCO (dDCO), this matter can be scoped out of further assessment.	mitigation measures to reduce the risk of leaks and spills is clearly described in Section 5.8. These mitigation measures are also secured in the draft Development Consent Order, Schedule 15 (**Application Document 3.1 Draft Development Consent Order**), **Application Document 7.5.2 Outline Offshore Construction Environmental Management Plan** and **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**
Planning Inspectorate 5.5.2	Paragraph 4.6.4.1 states that that only species which are qualifying features of statutory wildlife sites are considered within the Scoping Report. As a minimum, the ES should also include assessments of effects on any other species present within the ZoI which are legally protected, or which qualify as species of principal importance. It is noted that intertidal and shoreline bird surveys are ongoing. The Scoping Report does not explain how baseline data will be compiled for the offshore parts of the study area although the references to published data sources implies this will be based on desk studies. The Applicant should seek to agree the approach to gathering baseline data with relevant stakeholders and provide evidence of that agreement in the ES. The ES must present the baseline data clearly, including information on the 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. The Applicant's attention is drawn to the comments from Natural England on the need for further information on the approach to gathering baseline data (see Appendix 2 of this Opinion).	As presented in **Application Document 5.1.5 Appendix D EIA Scoping**, data resulting from intertidal and shoreline bird surveys have been presented in Section 5.7, and have been used to inform assessment of impacts and likely significant effects in Section 5.9. The number of individuals protected by designated sites, and therefore the number of individuals likely to be affected by the Proposed Project has also been provided, where possible, in Section 5.7.

Consultee	Comment	Response
Planning Inspectorate 5.5.3	The Scoping Report provides a detailed explanation of how the significance of effects would be determined, based on the relevant guidance from CIEEM. However, no description has been provided of the methods that will be used to assess impacts and whether these will be quantitative or qualitative. This is a matter of some concern to the Inspectorate, given that the Proposed Development passes through a section of the Outer Thames Estuary SPA. The SPA qualifying features include species such as red-throated diver which are known to be vulnerable to disturbance and which could be affected by construction and maintenance activities. The ES should clearly describe the methods used to quantify the extent of disturbance to the qualifying features. The methodologies used must be described and their use justified with reference to appropriate guidance and/or agreement with relevant consultation bodies/stakeholders.	As presented in **Application Document 5.1.5 Appendix D EIA Scoping,** a detailed methodology has been provided in Section 5.4 regarding assessing impacts on ornithological features, with relevant guidance also provided.

Statutory Consultation

5.3.2 Statutory Consultation for the Proposed Project took place between 24 October and 18 December 2023. A further Targeted Consultation exercise on the main changes to the Proposed Project introduced after the 2023 statutory consultation, was undertaken between 8 July and 11 August 2024. In addition, a project update and a local engagement exercise took place between 22 November 2024 and 12 January 2025, focusing on design amendments made following Targeted Consultation. A summary of relevant feedback received during consultation relating to water environment is provided in subsequent paragraphs below. Further details on how consultation responses have informed the assessment can be found in **Application Document 5.1 Consultation Report** and **Application Document 5.1.9 Appendix H Summary 2023 Response.**

- Natural England have requested that data from breeding and non-breeding bird surveys undertaken by the Applicant are considered to inform the assessment of the effect of disturbance at the landfall locations. Data were not available at the Preliminary Environmental Information Report (PEIR) stage but surveys have now been completed. Therefore, relevant data from the surveys have been incorporated into the baseline in Section 5.7.
- In addition, Natural England also advised that coastal designated sites overlapping with the intertidal works require further assessment. Therefore, using the data from breeding and non-breeding bird surveys at the landfalls, further assessment of the impacts on coastal designated sites has been undertaken in Section 5.9.

- Natural England have requested clarification on how the study area was calculated in relation to the maximum zone of influence for ornithological features. Further clarification has been provided in Section 5.6.
- Natural England have noted that their advice for red-throated diver (*Gavia stellata*) has been updated to cover the core over-wintering period. They have advised that a seasonal restriction of 1st November to 31st March is applied for works in the Outer Thames Estuary (OTE) SPA. Following discussion with Natural England, it has been agreed that a full seasonal restriction (1st November -31st March) for offshore cable installation activities within the Outer Thames Estuary SPA and a reduced seasonal restriction (1st January - 31st March) for landfall cable installation activities, have been applied, to avoid cumulative effects on the species. An assessment of cumulative impacts is presented in **Application Document 6.2.4.11 Part 4 Marine Chapter 11 Inter-Project Cumulative Effects.** This has also been included in **Application Document 7.5.3.2 Appendix B Register of Environmental Actions and Commitments**, and will be secured through the Deemed Marine Licence (DML).
- Natural England have also suggested the inclusion of several standard mitigation measures to manage impacts on ornithological features. These mitigation measures have been included in Section 5.8.

Further Engagement

5.3.3 Terrestrial ecology meetings with Natural England and the Royal Society for the Protection of Birds (RSPB) were also undertaken in February 2024. Further information is available in **Application Document 6.2.2.2 Part 2 Suffolk Chapter 2 Ecology & Biodiversity, Application Document 6.2.3.2 Part 3 Kent Chapter 2 Ecology & Biodiversity** and **Application Document 6.6 Habitats Regulations Assessment**.

Summary of Scope of Assessment

5.3.4 The following impact pathways were scoped out at the scoping stage as it was agreed with the Planning Inspectorate that the risk for the impact occurring was negligible and there will be sufficient mitigation measured in place (Table 5.6; Section 5.8). Therefore, the following impact pathway has not been considered further in this assessment:

- Alteration of water quality due to leaks and spills from vessels.

5.3.5 The following impacts on ornithological features are considered in this chapter as being the most likely impacts during the lifetime of the Proposed Project:

- Direct Disturbance and Displacement of Birds;
- Direct Loss and Disturbance of Seabed Habitat (including associated prey) used by Foraging Seabirds and Waterbirds;
- Alteration of Water Quality due to Increased Suspended Sediment Concentrations (SSC) and Disturbance of Contaminated Sediment and
- Decommissioning Effects the same or less than those during Construction and Operation.

5.4 Approach and Methodology

5.4.1 **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** sets out the overarching approach which has been used in developing the environmental assessment. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the ornithology assessment.

Guidance Specific to the Marine Ornithology Assessment

5.4.2 No specific guidance has been developed for assessing the impacts of offshore cables on birds. Therefore, the marine ornithology assessment has been carried out in accordance with the following good practice guidance documents for ecological impact assessment, with reference to appropriate conservation status reviews.

- Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in Britain and Ireland – Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);
- National and Local Biodiversity Action Plans (BAPs);
- The Birds of Conservation Concern (BoCC) 5 (Stanbury, et al., 2021);
- The Guide to Best Practice for Watching Marine Wildlife to reduce the disturbance of important marine species (NatureScot, 2017a); and
- The Scottish Marine Wildlife Watching Code for advice, information and recommendations for watching marine wildlife (NatureScot, 2017b).

Baseline Data Gathering and Forecasting Methods

Desk study

5.4.3 The following data sources have been used to characterise the baseline conditions:

- Citations and conservation objectives for designated sites – the citations and conservation objectives provide information on the species and populations which occur within the relevant sites, based on data collected from the sites during both wintering and breeding seasons. These citations and data have been used to determine important congregations of species which may interact with the Proposed Scheme and the location of any habitats important to birds within the Zone of Influence (ZoI) of the Proposed Project.
- Seabird foraging ranges (Woodward, Thaxter, Owen, & Cook, 2019) – foraging ranges are available for multiple seabird species. They provide information on the maximum distance each species is likely to travel from their relevant designated sites and habitats during foraging trips. These ranges have been used to indicate which seabirds are likely to be present in the ZoI of the Proposed Project.
- Distributions of seabirds within the North East Atlantic (Waggit, et al., 2019) – the distribution of seabirds is shown as density maps of UK waters, which have identified areas of important habitat in need of protection during development. These maps have been used to identify which seabird species are most likely to be present

within the Offshore Scheme in the highest densities and therefore may be particularly sensitive to impacts arising from the Proposed Project.

- Information on Annex I species by Joint Nature Conservation Committee (JNCC) and Natural England (for example departmental briefs for designated sites) – provides baseline information on the distribution and abundance of Annex I species which has helped in determining the spatial extent of designated sites. These baseline data aid in identifying species and key areas most at risk from impacts arising from the Proposed Project.
- Survey reports and Environmental Impact Assessments (EIAs) produced for surrounding construction projects, for example the Thanet Offshore Wind Farm (Vattenfall, 2018a; Vattenfall, 2018b) – Survey reports and EIAs for similar major development projects in the North Sea have been used to collate data on bird distributions and abundances relevant to the Study Area.
- Assessment of the density of red-throated diver in the Outer Thames Estuary SPA by Natural England (Natural England, 2019) – these density maps provide an indication of where 'hotspots' of red-throated diver are located within the Outer Thames Estuary SPA, and whether such 'hotspots' overlap with the Offshore Scheme.
- Wetland Bird Survey (WeBS) data for non-breeding seabirds and waterbirds in designated sites and within the Proposed Project area – the WeBS data provide the most recent annual mean counts of wetland bird species in a given area. These data have been used to support data gathered in field surveys to identify which species are present and using intertidal habitat at the landfall locations.

Field surveys

5.4.4 Site-specific ornithological surveys have been undertaken at both landfall locations in Kent and Suffolk. These are summarised in Table 5.7. The results of these surveys have been used to characterise the baseline relevant to the Offshore Scheme and inform the assessment of impacts presented in this chapter.

5.4.5 At the Suffolk landfall there are no intertidal habitats present, with the coastal zone comprising a narrow shingle beach with a very small littoral zone of mobile shingle, approximately 10 m wide between high water and low water. The beach area is also subject to heavy disturbance and so is of limited value to waterbirds and species that may interact with the Offshore Scheme. Surveys at the Suffolk landfall therefore, focussed on the grazing marsh and habitats inland from this. These habitats are beyond the ZoI of elements of the Offshore Scheme within the marine environment and therefore birds associated with these areas are not considered within this chapter. A detailed assessment of impacts on birds in terrestrial areas is presented in **Application Document 6.2.2.3 Part 2 Suffolk Chapter 3 Ecology and Biodiversity** and **Application Document 6.2.3.3 Part 2 Kent Chapter 2 Ecology and Biodiversity**.

Table 5.7 Details of bird surveys undertaken for the Proposed Project relevant to the Offshore Scheme

Survey (and relevant technical appendix	Survey method	Survey period	Survey area
Intertidal/foreshore bird survey at the Kent landfall (**Application Document 6.3.3.2.B Appendix 3.2.B Kent Wintering Birds 2022-2023** and **Application Document 6.3.3.2.C Appendix 3.2.C Kent Wintering Birds 2023-24)**	Monthly counts of waterbirds over high and low water periods based on WeBS count methods detailed in Gilbert et al. (1998) and Bibby et al. (2000). High tide counts were conducted within two hours either side of the high tide, and low tide counts within one hour of low tide.	October 2022 to March 2023 October 2023 to March 2024	Within the Order limits at the landfall corridor for the Offshore Scheme in Pegwell Bay and a 500 m zone around this, extending along the shoreline and across the intertidal area.
Breeding bird survey at the Kent landfall (**Application Document 6.3.3.2.D Appendix 3.2.D Kent Breeding Birds 2023** and **Application Document 6.3.3.2.E Appendix 3.2.E Kent Breeding Birds 2024**)	Six visits to record evidence of breeding birds based on methods set out in Gilbert et al. (1998) and Bibby et al. (2000). In addition, observations of waterbirds present on intertidal areas were also made.	March 2023 to July 2023 March 2024 to June 2024	Within the Order limits at the landfall corridor for the Offshore Scheme in Pegwell Bay and a 500 m zone around this, extending along the shoreline and across the intertidal area.

5.4.6 Further information regarding methodologies is presented in:

- **Application Document 6.3.2.2.B Appendix 2.2.B Suffolk Wintering Birds 2022-23 and 2023-2024**;
- **Application Document 6.3.3.2.B Appendix 3.2.B Kent Wintering Birds 2022-2023**;
- **Application Document 6.3.3.2.C Appendix 3.2.C Kent Wintering Birds 2023-24**;
- **Application Document 6.3.2.2.C Appendix 2.2.C Suffolk Breeding Birds 2023 and 2024**;
- **Application Document 6.3.3.2.D Appendix 3.2.D Kent Breeding Birds 2023**; and
- **Application Document 6.3.3.2.E Appendix 3.2.E Kent Breeding Birds 2024**.

Assessment Criteria

5.4.7 **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** sets out the overarching approach that has been used in developing the environmental information for this chapter. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of

effects and sets out the significance criteria that have been used for the marine ornithology assessment.

5.4.8 This assessment has been undertaken in accordance with best practice guidance for Ecological Impact Assessment (EcIA), issued by the CIEEM (the CIEEM guidelines) entitled 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Costal and Marine' as summarised below. The aims of the ecological assessment are to:

- identify important receptors (i.e., important bird species or populations) which may be impacted by the Proposed Project;
- provide a scientifically rigorous and transparent assessment of the likely ecological significant effects of the Proposed Project. Impacts and effects may be positive or negative;
- facilitate scientifically rigorous and transparent determination of the consequences of the proposed project in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps will be taken to adhere to legal requirements relating to the relevant receptors concerned.

5.4.9 The principal steps involved in the CIEEM approach can be summarised as determining:

- Bird species and populations that are both present and might be affected by the Proposed Project are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions.
- The importance of the identified receptors is evaluated, placing their relative nature conservation importance into geographic context, which is then used to define the relevant receptors that need to be considered further.
- The changes or perturbations predicted to result as a consequence of the proposed project (i.e., the potential impacts) and which could potentially affect relevant receptors are identified and their nature described. established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account.
- The likely effects (positive or negative) on relevant receptors are then assessed, and where possible quantified.
- Measures to avoid or reduce any predicted significant effects (additional mitigation), where possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines) and if necessary, measures to compensate for effects on features of nature conservation importance are also included.
- Any residual significant effects of the Proposed Project following additional mitigation are identified.
- Scope for ecological enhancement is considered.

5.4.10 It is not necessary in the assessment to address all species with potential to occur in the relevant Study Area and instead the focus is on those that are 'relevant', *i.e.,* ornithological receptors that are considered to be important and potentially affected by the Proposed Project. This does not mean that efforts should not be made to safeguard wider biodiversity, however, and this has been considered where appropriate.

Sensitivity and value of ornithology receptors

5.4.11 To support a focussed assessment, there is a need to determine the scale at which the relevant receptors identified through the desk studies and field surveys undertaken for the Proposed Project are of value. The value of each receptor has been defined with reference to the geographical level at which it matters, informed through relevant planning policy and legislation (see Section 5.2), which is important in demonstrating how the Proposed Project will comply with statutory requirements and policy objectives for biodiversity, in accordance with Section 4.3 of the CIEEM guidelines (CIEEM, 2018).

5.4.12 Species populations are valued on the basis of their size, recognised status (such as through published lists of species of conservation concern and designation of Biodiversity Action Plan (BAP) status) and legal protection. For example, bird populations exceeding 1% of published information on biogeographic populations are considered to be of international importance, those exceeding 1% of published data for national populations are considered to be of national importance, and so on.

5.4.13 In addition, the vulnerability of the receptor to change and its ability to recover will be considered. Vulnerability to various impacts differs between different species of birds, for example those that are more vulnerable to activities from marine vessels due to time spent at sea such as red-throated diver, or those which are more vulnerable to disruption to intertidal habitat such as waders and waterbirds. In addition, ability to recover also differs between species, with some more likely to recover over a shorter timeframe due to increased fecundity for example.

5.4.14 Assessing the value of receptors requires consideration of both existing and future predicted baseline conditions. Therefore, the description and valuation of ecological features takes account of any likely changes, such as trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other proposed developments or land use changes, as explained in the Future Baseline section of this chapter.

5.4.15 Consideration of the value, importance and vulnerability of bird species and populations have been used to define the 'sensitivity' of an ecological feature. Based on the criteria set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** these are defined as follows: very high, high, medium, low and negligible.

5.4.16 For the purposes of the assessment within this chapter, receptors of at least low sensitivity are considered to require assessment for potential significant effects. Whilst consideration of impacts against all features is important, receptors of less than low sensitivity (i.e., of negligible sensitivity) are common and widespread and are not legally protected or included within local planning policy. As the CIEEM guidelines (CIEEM, 2018) state, there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*".

Magnitude of ornithology effects

5.4.17 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

- Positive or negative - i.e., is the change likely to be in accordance with nature conservation objectives and policy and is that change:
  - Positive - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g., increasing the extent of a habitat of conservation value; or
  - Negative - a change that reduces the quality of the environment e.g., destruction of habitat.
- Spatial extent - the spatial or geographical area or distance over which the impact or effect may occur under a suitably representative range of conditions.
- Scale - the 'size', 'amount' or 'intensity' and 'volume' of an impact - this is described on a quantitative basis where possible.
- Duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact.
- Timing and frequency - consideration of the point at which the impact occurs in relation to critical life-stages or seasons.
- Reversibility – A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation, whereas an irreversible effect is one from which recovery is not possible within a reasonable timescale i.e., within the lifespan of the Proposed Project (in the context of the feature being assessed), or there is no reasonable chance of action being taken to reverse it.
- Temporary or permanent – determining if the impact is temporary or permanent. A temporary impact is one that occurs for a limited duration or that will alter a condition for a short period of time, as opposed to a permanent effect, which is one that persists over time and does not easily revert to its original state.

5.4.18 Birds are highly mobile species and may simply be able to fly or swim away from an affected area for the duration of an impact, potentially returning once the impact is removed, although the magnitude may be greater if repeated disturbance or displacement occurs. For birds that may be nesting or foraging, avoidance of the impact could interfere with breeding success or result in increased energy exertion to find new foraging grounds. Thus, when determining the magnitude of impacts on birds, life history, ecology, habitat use, foraging extent and proximity of the impact to designated sites of the receptor will be considered.

5.4.19 Combined, these characteristics define the 'magnitude' of the impact, based on the criteria detailed in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** and defined as follows: large, medium, small, and negligible.

Significance of ornithology effects

5.4.20 For each receptor, only those characteristics relevant to understanding the ecological effect of the Proposed Project and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant receptors, as follows:

- Not significant - no effect on structure and function, or conservation status; and
- Significant - structure and function, or conservation status is affected.

5.4.21 As set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology** the approach taken to determining the significance of effect in this assessment considers all factors contributing to sensitivity and magnitude of the receptors, as well as any mitigation measure, both embedded and additional, which could reduce the overall significance of an impact.

5.4.22 Professional judgement has also been applied, and a precautionary approach has been adopted to ensure the worst-case scenario is assessed.

Assumptions and Limitations

5.4.23 Consistent with the approach outlined during non-statutory scoping and at PEIR stage, no specific surveys for birds in the offshore environment have been undertaken for the Proposed Project. This is considered a proportionate approach given, the temporary nature of works within the marine environment, with impacts primarily arising during installation works. In addition, the availability of ornithological data for the North Sea region is considered to be sufficient to characterise the baseline, ensuring the assessment is based on a good understanding of the existing environment.

5.5 Basis of Assessment

5.5.1 This section sets out the assumptions that have been made in respect of design flexibility maintained within the Proposed Project and the consideration that has been given to alternative scenarios and the sensitivity of the assessment to changes in the construction commencement year.

5.5.2 Details of the available flexibility and assessment scenarios are presented in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project** and **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**.

Flexibility Assumptions

5.5.3 The environmental assessments have been undertaken based on the description of the Proposed Project provided in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or Order Limits. In all cases the worst-case scenario has been taken forward for consideration in the assessment.

5.5.4 The assumptions made regarding the use of flexibility for the main assessment, and any alternatives assumptions are set out in Table 5.8 below.

Table 5.8 Flexibility assumptions

Element of flexibility	How it has been considered within the assessment?
Lateral LoD marine High-Voltage Direct Current (HVDC) cable	The worst-case scenario assessed for the Offshore Scheme is one bundled HVDC (x2) and one bundled fibre optic cable in one trench. This bundled scenario may be placed anywhere within the Offshore Scheme Boundary.

Sensitivity Test

5.5.5 It is likely that under the terms of the draft DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference, this is reported in Section 5.9.

5.6 Study Area

5.6.1 The Offshore Scheme runs from mean high-water springs (MHWS) at the landfall in Suffolk, to MHWS at the landfall in Pegwell Bay in Kent, crossing the outer Thames Estuary in the southern North Sea. The marine HVDC cable route is up to 122 km in length and is situated entirely within UK territorial waters.

5.6.2 Within this chapter, the following terminology is used when referring to the geographic areas within which assessments were made:

- Study Area - the area within the Order limits and a 10 kilometre (km) radius which was subject to collection of background information e.g., desk study search for designated sites with birds as a qualifying feature and presence of notable bird species;
- Zone of Influence (ZoI) – area over which receptors may be affected by the Proposed Project, using the criteria below and proportionate to the Proposed Project's potential to impact on each receptor. The ZoI was kept under review, e.g., with respect to likely impacts of the Proposed Project and results of the desk study, which was then used to inform the requirements for field surveys; and
- Survey Area – this is the area within which field survey work carried out by the Applicant was undertaken.

5.6.3 CIEEM (2018) define the ZoI as: "*…the area over which biodiversity features may be affected by biophysical changes as a result of the proposed project and associated activities*". The ZoI is based on:

- the nature of the Proposed Project activities, and the potential for effects at all development stages (construction, operation and decommissioning);

- the nature of the land use and habitats in the vicinity, their connectivity, and how they may be used by different species;
- the presence and assemblages of species which may be in the area based on the location of the Order limits and desk study data; and
- the different habits, behaviours and preferences of different species that could be affected, and how these vary both spatially and seasonally.

5.6.4 The Study Area acknowledges that bird species are highly mobile and have a wide-ranging nature across the marine environment. Thus, local impacts could have potential implications on wider populations. Based on the maximum likely zones of influence of the Offshore Scheme, i.e., the area over which impacts on sensitive ornithological receptors could occur, the Study Area for the baseline characterisation extends to a 10 km corridor around the Offshore Scheme in the marine environment up to MHWS. This Study Area captures any marine and coastal sites designated for the protection of birds within 10 km of the Offshore Scheme, as well as identifying species and populations recorded in the marine environment within this area. Where the presence of species and populations has been identified within the Study Area, consideration has also been given to the large foraging distances exhibited by some seabirds, as defined in Woodward et al. (2019) and the possibility of these individuals being associated with designated sites beyond 10 km.

5.6.5 The Study Area for the marine ornithology baseline is shown in **Figure 6.4.4.5.1 Study Area (Application Document 6.4.4.5 Marine Ornithology)**.

5.7 Baseline Conditions

5.7.1 The following sections describe the baseline conditions for marine ornithological features likely to be present in the Offshore Scheme and wider Study Area, as defined in Section 5.6.

Relevant Designated Sites

5.7.2 The Offshore Scheme directly passes through six sites that are designated nationally or internationally for the protection of birds (**Figure 6.4.4.5.2 Relevant Designated Sites for the Protection of Ornithology (Application Document 6.4.4.5 Marine Ornithology)**).

5.7.3 These are the Outer Thames Estuary SPA, Thanet Coast and Sandwich Bay SPA, Thanet Coast and Sandwich Bay Ramsar site, Sandwich and Pegwell Bay National Nature Reserve (NNR), Sandwich Bay to Hacklinge Marshes SSSI, and Leiston-Aldeburgh SSSI (Table 5.9). A further six sites intersect with the Study Area, these being Minsmere-Walberswick SPA, Minsmere-Walberswick Ramsar site, Minsmere-Walberswick Heaths and Marshes SSSI, Alde-Ore Estuary SPA, Alde-Ore Estuary Ramsar site and Alde-Ore Estuary SSSI. Only sites where the qualifying features i.e., seabirds and waterbirds, are likely to interact with the Offshore Scheme have been considered in this baseline. Where information is available to allow qualifying populations to be quantified, this is provided in Table 5.9.

Table 5.9 Sites designated for birds within the study area

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
Outer Thames Estuary SPA	Little tern (*Sternula albifrons*) (Breeding) 746 individuals (2011 – 2015) 19.64% of GB population. Common tern (*Sterna hirundo*) (Breeding) 532 individuals (2011 – 2015) 2.66% of GB population Red-throated diver (Non-breeding) (6,466 individuals 1989 – 2006/07; 38% of GB population)	The Offshore Scheme passes through the SPA for approximately 29 km, at two locations. Firstly, as the Offshore Scheme leaves the Suffolk landfall and secondly, midway along the route of the Offshore Scheme at the outer reaches of the Thames Estuary. Thus, the Offshore Scheme passes directly through the areas designated for foraging common tern and little tern, and non-breeding (wintering) red-throated diver. All three cited species are likely to be present in the Study Area and interact with the Offshore Scheme. Features relevant to Offshore Scheme – Little tern, common tern and red-throated diver.
Leiston-Aldeburgh SSSI	Many species of bird regularly breed using the great mix of habitats available. These include nightjar (*Caprimulgus europaeus*), woodlark (*Lullula arborea*) and skylark (*Alauda arvensis*) on the dry grassland and heath. The scrub and woodland support tree pipit (*Anthus trivialis*), turtle dove (*Streptopelia turtur*), bullfinch (*Pyrrhula pyrrhula*) and nightingale (*Luscinia megarhynchos*). The marshes, the open water and their margins, in particular, support a diverse range of	Where the Offshore Scheme leaves the landfall in Suffolk, it passes through approximately 0.05 km of the coastal portion of the SSSI. The qualifying features noted in the citation are associated with terrestrial and freshwater habitats within the SSSI and are unlikely to interact with the Offshore Scheme. As there is likely to

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	breeding birds, including water rail (*Rallus aquaticus*), marsh harrier (*Circus aeruginosus*), gadwall (*Anas strepera*) and grasshopper warbler (*Locustella naevia*). The site is also attractive to wintering waterfowl including Bewick's swan (*Cygnus columbianus*) and bittern (*Botauris stellaris*) and regularly supports important populations of white-fronted goose (*Anser albifrons*), gadwall and teal (*Anas crecca*).	be no or negligible interaction between these species and the Offshore Scheme, they are not identified as relevant receptors and are not considered further in the assessment. Features relevant to Offshore Scheme - none
Thanet Coast and Sandwich Bay SPA	**Breeding seabird (Annex I)** Little tern (6 pairs; >1% GB population) **Non-breeding waterbirds** Golden plover (*Pluvialis apricaria*) (Annex I) (411 individuals; 1% of GB population (1991/92-1995/96)) Ruddy turnstone (*Arenaria interpres*) (940 individuals; 3% GB wintering population (1991/92-1995/96))	The Offshore Scheme passes beneath approximately 1.9 km of saltmarsh and intertidal mudflats within the SPA where it leaves the landfall in Pegwell Bay, Kent. As such, little tern and cited non-breeding wader species are likely to occur within the Study Area and interact with the Offshore Scheme. Features relevant to Offshore Scheme – Little tern, golden plover and turnstone
Thanet Coast and Sandwich Bay Ramsar site	**Breeding seabird (Annex I)** Little tern **Non-breeding waterbirds** Ruddy turnstone Ringed plover Grey plover Sanderling	The Offshore Scheme passes beneath approximately 1.9 km of saltmarsh and intertidal mudflats within the Ramsar site where it leaves the landfall in Pegwell Bay, Kent. As such, little tern and cited non-breeding wader species are likely to occur within the Study Area and interact with Offshore Scheme. Features relevant to Offshore Scheme – Little tern, golden plover, turnstone,

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
		ringed plover, grey plover and sanderling
Sandwich Bay to Hacklinge Marshes SSSI	**Breeding seabirds (Annex I)** Little tern **Breeding waterbirds** Oystercatcher (*Haematopus ostralegus*) Ringed plover **Non-breeding waterbirds** Grey plover Sanderling Dunlin (*Calidris alpina*) Oystercatcher Curlew (*Numenius arquata*) Redshank (*Tringa totanus*) Brent goose (*Branta bernicla*) Shelduck (*Tadorna tadorna*)	The Offshore Scheme passes beneath approximately 2 km of the SSSI when it leaves the landfall in Pegwell Bay, Kent. As such, little tern and cited breeding and non-breeding wader species are likely to occur within the Study Area and interact with the Offshore Scheme. Features relevant to Offshore Scheme – Little tern, oystercatcher, turnstone, ringed plover, grey plover, dunlin, curlew, redshank, brent goose and sanderling
Sandwich and Pegwell Bay NNR	**Breeding waterbirds** Oystercatcher Ringed plover **Breeding terrestrial birds** Nightingale Cuckoo (*Cuculus canorus*) **Non-breeding seabirds** Little tern (Annex I) Sandwich tern (*Sterna sandvicensis*) (Annex I)	The Offshore Scheme passes beneath approximately 2 km of the NNR when it leaves the landfall in Pegwell Bay, Kent. As such, little tern, sandwich tern and cited breeding and non-breeding wader species are likely to occur within the Study Area and interact with the Offshore Scheme. The noted features (Nightingale and Cuckoo) that are associated with terrestrial habitats within the NNR are

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Non-breeding waterbirds Cormorant (*Phalacrocorax carbo*) Dunlin Sanderling Grey plover Black-tailed godwit (*Limosa limosa islandica*) Redshank Snipe (*Gallinago gallinago*) Wigeon (*Anas penelope*) Teal Shelduck Brent goose	unlikely to occur within the Study Area or interact with the Offshore Scheme. As there is likely to be no or negligible interaction between these species and the Offshore Scheme they are not considered further in the assessment. Features relevant to Offshore Scheme – oystercatcher, ringed plover, little tern, sandwich tern, cormorant, dunlin, sanderling, grey plover, black-tailed godwit, redshank, snipe, wigeon, teal shelduck and brent goose
Alde-Ore Estuary SPA	**Breeding seabirds** Little tern (Annex I) (Eastern Atlantic – breeding) 2% of the GB breeding population 5 count mean, 1993-4,1996-8 Sandwich tern (Annex I) (Western Europe/Western Africa) 1.2% of the GB breeding population 5 year mean, 1992-1996 Lesser black-backed gull (*Larus fuscus*) (Western Europe/Mediterranean/Western Africa) 11.3% of the breeding population 5 year mean 1994-1998 **Breeding waterbirds and terrestrial birds** Marsh harrier (Annex I) at least 1.9% of the GB breeding population 5 year mean, 1993-1997	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 1.07 km to the north of Alde-Ore Estuary SPA. The Offshore Scheme is within the foraging ranges of little tern, sandwich tern and lesser black backed gull (Woodward, Thaxter, Owen, & Cook, 2019) and these three species have the potential to interact with the Offshore Scheme. The remaining species (marsh harrier, avocet, redshank and ruff) are more strongly associated with the freshwater and estuarine habitats of the SPA and

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Avocet (*Recurvirostra avosetta*) (Annex I) (Western Europe/Western Mediterranean – breeding) 23.1% of the GB breeding population 5 year mean, 1990-1994 Oystercatcher Redshank Ringed plover **Non-Breeding waterbirds and terrestrial birds** Avocet (Annex I) (Western Europe/Western Mediterranean – breeding) 60.3% of the GB population 5-year peak mean Redshank (Eastern Atlantic – wintering) 1.1% of the population 5-year peak mean 1991/92-1995/96 Ruff (*Calidris pugnax*) (Annex I) (Western Africa – wintering) 0.4% of the GB population 5-year peak mean 1991/92-1995/96	are unlikely to interact with the Offshore Scheme off the Suffolk coast. Features relevant to Offshore Scheme – little tern, sandwich tern and lesser black-backed gull
Alde-Ore Estuary Ramsar site	**Breeding seabirds** Lesser black-backed gull (14,070 pairs; 11.3% GB breeding population) Mediterranean gull (*Larus melanocephalus*) (6 occupied nests; 5.5% of GB population) Little tern (Annex I) (88 occupied nests; 4.5% of the GB population) Sandwich tern (Annex I) (169 pairs; 1.6% GB population) **Breeding waterbirds** Avocet (Annex I) (104 pairs; 23.1% GB population) Marsh harrier (Annex I) (3 pairs; 1.9% GB population)	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 1.07 km to the north-east of the Alde-Ore Estuary Ramsar site. As with the Alde-Ore Estuary SPA, the Offshore Scheme is within the foraging ranges of little tern, sandwich tern and lesser black backed gull (Woodward, Thaxter, Owen, & Cook, 2019) and these three species have the potential to interact with the Offshore Scheme. The remaining species are more strongly associated with the freshwater and estuarine habitats of the SPA and

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Oystercatcher Redshank Ringed plover **Non-breeding waterbirds** Avocet (Annex I) (1187 individuals; 1.6% GB population) Redshank (2368 individuals; 2% GB population) Black-tailed godwit (268 individuals; 3.6% GB population) Shelduck (1059 individuals; 1.4% GB population Shoveler (*Anas clypeata*) (106 individuals; 1.1% GB population Spotted redshank (*Tringa erythopus*) (3 individuals; 2.5% GB population Teal (1931 individuals; 1.4% GB population) European white-fronted goose (97 individuals; 1.6% GB population) Wigeon (4366 individuals; 1.6% GB population) Winter waterbird assemblages	are unlikely to interact with the Offshore Scheme off the Suffolk coast. Features relevant to Offshore Scheme – little tern, sandwich tern and lesser black-backed gull
Alde-Ore Estuary SSSI	**Breeding seabirds** Common tern (Annex I) Arctic tern (*Sterna paradisaea*) (Annex I) Sandwich tern (Annex I) Little tern (Annex I) Common gull (*Larus canus*) Black-headed gull (*Chroicocephalus ridibundus*) Lesser black-backed gull	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 1.07 km to the northeast of the Alde-Ore Estuary SSSI. The Offshore Scheme is within the foraging ranges of common tern, arctic tern, sandwich tern, little tern, common gull, black-headed gull, lesser black backed gull and herring gull (Woodward, Thaxter,

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Herring gull *(Larus argentatus)* **Breeding waterbirds/wader** Avocet (Annex I) Gadwall Shoveler Oystercatcher Ringed plover Redshank Short-eared owl (*Asio flammeus*) (Annex I) Wheatear (*Oenanthe oenanthe)* Marsh harrier (Annex I)	Owen, & Cook, 2019) and these species have the potential to interact with the Offshore Scheme. The remaining species are more strongly associated with the terrestrial, freshwater and estuarine habitats of the SPA and are unlikely to interact with the Offshore Scheme off the Suffolk coast. Features relevant to Offshore Scheme - common tern, arctic tern, sandwich tern, little tern, common gull, black-headed gull, lesser black backed gull and herring gull
Minsmere-Walberswick SPA	Little tern (Annex I) (32 pairs; 1% GB breeding population Bittern (Annex I) (5 booming males/breeding pairs presumed; 22% of GB breeding population) Marsh harrier (Annex I) (15 breeding females; 20% of GB breeding population) Avocet (Annex I) (47 pairs; 12% of GB breeding population) Nightjar (Annex I) (24 pairs; 1% of GB population) Gadwall (24 pairs; 4% GB breeding population) Teal (73 pairs; 1% of GB breeding population) Shoveler (23 pairs; 2% GB breeding population) Bearded tit (*Panurus biarmicus*) Garganey (*Anas querquedula*)	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 1.7 km to the south of the Minsmere-Walberswick SPA. The Offshore Scheme is within the foraging range of little tern (Woodward, Thaxter, Owen, & Cook, 2019) and this species has the potential to interact with the Offshore Scheme. The remainder of the qualifying features are associated with the terrestrial and freshwater habitats within the SPA and unlikely to occur within the Offshore Scheme. As there is likely to be no or negligible interaction between these species and

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Water rail Cetti's warbler (*Cettia cetti*) Savi's warbler (*Locustella lusciniodes)* Oystercatcher Redshank Ringed plover **Non-breeding** Hen harrier (*Circus cyaneus*) (Annex I) (15 individuals; 2% of GB wintering population) European white-fronted goose (100 individuals; 2% GB wintering population (1985/86-1989/90) Gadwall (90 individuals; 1% GB wintering population (1985/86-1989/90) Shoveler (100 individuals; 1% GB wintering population) Bewick's swan (Annex I) Wigeon Teal Avocet (Annex I) Spotted redshank Redshank	the Offshore Scheme they are not considered further in the assessment. Features relevant to Offshore Scheme – little tern.
Minsmere-Walberswick Ramsar site	Little tern (Annex I) (20 occupied nests; 32 breeding pairs; 1% GB population) Mediterranean gull (Annex I) (2 occupied nests; 1.8% GB population) Black-headed gull (2,558 occupied nests; 1.9% GB population)	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 9.12 km to the south of the Minsmere-Walberswick Ramsar site. The Offshore Scheme is within the foraging ranges of little tern, Mediterranean gull and black-headed gull (Woodward,

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Bittern (Annex I) (5 booming males; 3-4% GB population) Marsh harrier (Annex I) (16 breeding females; 10.5% GB population) Avocet (Annex I) (47 breeding pairs) Nightjar (Annex I) (24 breeding pairs) Bearded tit (~50 breeding pairs) Oystercatcher Redshank Ringed plover **Non-breeding** Bittern (Annex I) (3 individuals; 3% GB population) Gadwall (261 individuals; 1.5% GB population) Teal (3083 individuals; 1.6% GB population) Shoveler (238 individuals; 1.6% GB population) Ruff (Annex I) (10 individuals; 1.4% GB population) Black-tailed godwit (846 individuals; 5.4% GB population) Spotted redshank (15 individuals; 11% GB population) Common greenshank (*Tringa nebularia*) (9 individuals; 1.5% GB population) European white-fronted goose (212 individuals; 3.6% GB population) Hen harrier (Annex I) (15 individuals; 2% GB population) Common redshank (1386 individuals; 1.1% GB population)	Thaxter, Owen, & Cook, 2019) and these three species have the potential to interact with the Offshore Scheme. The remainder of the qualifying features are associated with the terrestrial and freshwater habitats within the Ramsar and unlikely to occur within the Offshore Scheme. As there is likely to be no or negligible interaction between these species and the Offshore Scheme they are not considered further in the assessment. Features relevant to Offshore Scheme - little tern, Mediterranean gull and black-headed gull

Designated Site	Reason for Designation/Qualifying Features	Relationship to the Offshore Scheme and potential for cited qualifying species to interact with the Offshore Scheme
	Lesser black-backed gull (905 individuals; 1.4% GB population)	
Minsmere-Walberswick Heaths and Marshes SSSI	**Breeding species** Reed warbler (*Acrocephalus scirpaceus*) Bearded tit Bittern (Annex I) Marsh harrier (Annex I) Cetti's warbler Garganey Water rail Avocet (Annex I) Shoveler Gadwall Teal Shelduck Redshank Black-tailed godwit Oystercatcher Ringer plover **Non-breeding species** Wigeon Shelduck Redshank Dunlin	Where the Offshore Scheme leaves the Suffolk landfall it is approximately 8.37 km to the south of the Minsmere-Walberswick Heaths and Marshes SSSI. The site contains important habitat for breeding and non-breeding bird populations, including several Annex I species. However, the qualifying features are associated with the terrestrial and freshwater habitats within the SSSI and unlikely interact with the Offshore Scheme. As there is likely to be no or negligible interaction between these species and the Offshore Scheme they are not considered further in the assessment. Features relevant to Offshore Scheme - none

Review of Existing Bird Data

5.7.4 The southern North Sea is a busy area for shipping and recreation, along with hosting many renewable energy projects (such as offshore wind farms (OWFs)) and other marine infrastructure. As such, the area is well studied and has been subject to extensive surveys of birds in the marine environment. In general, this region of the North Sea is of lower ornithological interest during the breeding season than more northern areas, as it lacks the extensive cliff nesting seabird colonies and therefore, a lower dependence on these offshore waters for foraging. However, it is noted that during the breeding season the southern North Sea and particularly the inshore areas are important for foraging gulls and terns.

5.7.5 As such, much of the focus of impact assessments, post-consent monitoring surveys and marine designations within the southern North Sea has been on seabirds in the non-breeding period. A review of ornithological surveys and monitoring at OWFs and other relevant infrastructure in the southern North Sea and relevant to the Offshore Scheme has been undertaken and the key species associated with these sites are provided in Table 5.10. These data have been used to help inform the baseline of the Offshore Scheme.

Table 5.10 Summary of existing bird data

Scheme Name	Approximate Distance to Offshore Scheme and Direction	Most Recent Ornithological Monitoring Result Sources	Important Ornithological Features
Five Estuaries offshore wind farm	0 km – The Five Estuaries northern export cable crosses the Offshore Scheme at KP 50.181 and southern corridor at KP 52.719.	Five Estuaries Offshore Wind Farm Environmental Statement: Chapter 4 Offshore Ornithology (MacArthur Green, 2024a). Five Estuaries Offshore Wind Farm Environmental Statement: Annex 4.1 Offshore Ornithology Technical Report (MacArthur Green, 2024b).	Red-throated diver, fulmar (*Fulmarus glacialis*), gannet (*Morus bassanus*), cormorant, artic skua (*Stercorarius parasiticus*), great skua (*Stercorarius skua*), puffin, razorbill (*Alca torda*), guillemot (*Uria aalge*), common tern, sandwich tern, kittiwake (*Rissa tridactyla*), black-headed gull, little gull (*Hydrocoloeus minutus*), common gull, lesser black-backed gull, herring gull and great black-backed gull (*Larus marinus*).
East Anglia One offshore wind farm	0.36 km to the north of the Offshore Scheme as it approaches the Suffolk landfall	East Anglia ONE Offshore Wind Farm Environmental Statement: Chapter 12 Offshore Ornithology (Royal HaskoningDHV, 2019a). Site-specific aerial surveys of the windfarm and a 4 km buffer between September 2016 and August 2018 to complete 24 months of data.	Red-throated diver, fulmar, gannet, razorbill, guillemot, sandwich tern, kittiwake, black-headed gull, little gull, Mediterranean gull, common gull, lesser black-backed gull, herring gull and great black-backed gull.
East Anglia Two offshore wind farm	0.36 km to the north of the Offshore Scheme as it approaches the Suffolk landfall	East Anglia TWO Offshore Wind Farm Environmental Statement: Chapter 12 Offshore Ornithology (Royal HaskoningDHV, 2019b).	Red-throated diver, black-throated diver (*Gavia artica*), great northern diver (*Gavia immer*), gannet, cormorant, razorbill, guillemot,

Scheme Name	Approximate Distance to Offshore Scheme and Direction	Most Recent Ornithological Monitoring Result Sources	Important Ornithological Features
		Site-specific aerial surveys of the windfarm site and a 4 km buffer between November 2015 – April 2016, September 2016 and October 2017, and May to August 2018.	black-headed gull, little gull, common gull, lesser black-backed gull, herring gull and great black-backed gull.
Thanet offshore wind farm	0.62 km to the east of the Offshore Scheme as it approaches the landfall in Kent.	Thanet Extension Offshore Wind Farm: Annex 4-1: Baseline Technical Report – Offshore Ornithology (Ref). Thanet Extension Offshore Wind Farm: Environmental Statement Volume 2: Chapter 4: Offshore Ornithology (Vattenfall, 2018). Boat surveys were conducted over one day per month from January to March 2018 and 2019, resulting in six days of survey in total. Aerial surveys were conducted once a month from March 2016 to February 2018.	Red-throated diver, fulmar, gannet, common gull, kittiwake, herring gull, great black-backed gull, lesser black-backed gull, razorbill and guillemot were all recorded widely across the survey area during the non-breeding season in low densities.
London Array offshore wind farm	1.18 km to the west of the Offshore Scheme in the outer reaches of the Thames Estuary.	London Array Offshore Wind Farm: ES – Non-Technical Summary (RPS Group Plc, 2005a). London Array Offshore Wind Farm: ES – Volume 1: Offshore Works (RPS Group Plc, 2005b). Boat surveys were conducted in and around the site of the wind farm, with a 2 km buffer over a	The key species recorded during non-breeding surveys was red-throated diver. All other species of seabird were recorded in much lower densities, including black-throated diver, great northern diver, fulmar, manx shearwater (*Puffinus puffinus*), gannet, cormorant, shelduck, teal, wigeon,

Scheme Name	Approximate Distance to Offshore Scheme and Direction	Most Recent Ornithological Monitoring Result Sources	Important Ornithological Features
		period of two days per month for two years and a third winter from dawn through to nightfall. Aerial surveys were conducted over a wider area, between August 2002 – January 2004, during February 2004, and in the winter period between 2004 and 2005.	common scoter (*Melanitta nigra*), velvet scoter (*Melanitta fusca*), ringer plover, grey plover, knot (*Calidris canutus*), curlew, little gull, black-headed gull, common gull, lesser black-backed gull, herring gull, great black-backed gull, kittiwake, sandwich tern, common tern, guillemot and razorbill.
Greater Gabbard offshore wind farm	6.35 km to the east of the Offshore Scheme in the outer reaches of the Thames Estuary.	Greater Gabbard Offshore Wind Farm: Environmental Statement (PMSS, 2005). There were 13 boat-based surveys conducted between February 2004 and March 2005, covering nine transects over two days during each survey.	A wide variety of non-breeding seabirds were recorded with key species considered to be red-throated diver, common scoter, little gull, herring gull, great black-backed gull, kittiwake, guillemot and razorbill. Surveys during the breeding season recorded limited sightings of foraging little tern and sandwich tern.
Galloper offshore wind farm	11.9 km to the east of the Offshore Scheme in the outer reaches of the Thames Estuary.	Galloper Wind Farm Project: ES – Non-Technical Summary (Galloper Wind Farm Limited, 2011). Project specific boat-based and aerial surveys.	Surveys identified red-throated diver, great skua, Arctic skua, gannet, fulmar and a variety of gull and auk species, including, lesser black-backed gull, great black-backed gull, common guillemot, razorbill, herring gull, kittiwake and common gull.

Scheme Name	Approximate Distance to Offshore Scheme and Direction	Most Recent Ornithological Monitoring Result Sources	Important Ornithological Features
Gunfleet Sands I and II offshore wind farm	26 km to the west of the Offshore Scheme, off the Essex coast.	Gunfleet Sands II Offshore Wind Farm: Environmental Statement (RPS Group Plc, 2007). Boat-based surveys conducted between January 2005 to February 2007.	The most abundant wintering species recorded were gulls, including lesser black-backed gull, herring gull and kittiwake. Red-throated diver was also widely recorded. Birds observed during the breeding season include small numbers of cormorant.
Kentish Flats offshore wind farm	28.5 km to the west of the Offshore Scheme, off the north Kent coast.	Kentish Flats Offshore Wind Farm: ES – Chapter 6 Existing Biological Environment (GREP, 2002). Kentish Flats Offshore Wind Farm, FEPA Monitoring Summary 2004-2008 (Vattenfall, 2009). Kentish Flats Offshore Wind Farm Extension: Environmental Scoping Study (Vattenfall, 2010a). Kentish Flats Offshore Wind Farm: Diver Surveys 2009-10 (Vattenfall, 2010b). 108 boat-based surveys over 14 months between 2001 and 2002. A further 12 winter surveys were conducted in the winters of 2008/2009 and 2009/2010 for the distribution of red-throated diver.	Density of birds in the marine environment was low, with red-throated diver and terns identified as most sensitive species in the Study Area. Breeding birds of concern: sandwich tern and common tern. Wintering birds of concern: cormorant, common gull, lesser black-backed gull, herring gull, great black-backed gull.
Sizewell C	5 km north	Sizewell C Project: Volume 2 Main Development Site – Chapter 14	Breeding birds: avocet, shoveler, gadwall, teal, marsh harrier, little

Scheme Name	Approximate Distance to Offshore Scheme and Direction	Most Recent Ornithological Monitoring Result Sources	Important Ornithological Features
		Terrestrial Ecology and Ornithology (EDF Energy, 2020)	tern, common tern, sandwich tern, lesser black-backed gull, kittiwake Wintering: avocet, shoveler, redshank, gadwall, teal, red-throated diver.

Breeding Seabirds

5.7.6 The Study Area is located in waters that are used by foraging seabirds, including those from designated sites presented in Table 5.9. The breeding season for seabirds varies between species but broadly extends between April and August, with the core breeding period between May and July, during which time their distribution offshore is constrained by the need to return to their breeding sites. Following breeding, seabirds disperse away from their colonies to their wintering areas, for example they may travel west into the Atlantic or southwards through the North Sea.

5.7.7 With reference to Table 5.10, the following sections set out information for characterising the baseline conditions for seabirds most likely to occur within the Study Area during the breeding season, that have the potential to interact with the Offshore Scheme.

Lesser black-backed gull

5.7.8 Waggit et al. (2019) present the distributions of seabirds within the North East Atlantic. These data note that around the UK, there are higher concentrations of lesser black-backed gull associated with the southern North Sea, including the area of the Offshore Scheme, with density increasing considerably in the summer months (**Figure 6.4.4.5.3 Lesser Black-backed Gull Spatial Variation in Predicted Densities (individuals/km2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**). A density hotspot for the species in the summer occurs around the Suffolk landfall, including the Alde-Ore Estuary SPA, for which lesser black-backed gull is a qualifying feature (Table 5.9). The figure demonstrates the importance of the marine areas offshore from the Alde-Ore Estuary SPA in providing foraging areas for individuals from the breeding colony. This suggests that lesser black-backed gull is likely to be present throughout Study Area, including within the Offshore Scheme, during foraging trips from breeding colonies.

5.7.9 In the Alde-Ore Estuary SPA, lesser black-backed gull occurs in two separate colonies mixed with herring gull, located at Orford Ness and Havergate Island (Davis, et al., 2018). Both colonies have similar breeding rates, with both also suffering from mammalian egg predation resulting in decreased breeding success. In recent years, the number of lesser black-backed gull breeding pairs has been increasing, with a peak of 2,399 pairs observed in 2015 (cited in Natural England (2021)).

5.7.10 Lesser black-backed gull is considered to be of high value, as it is a qualifying feature of the Alde-Ore Estuary SPA.

Herring gull

5.7.11 Breeding herring gull is a qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary SSSI. Although qualifying due to the breeding population, herring gull is present and frequently recorded around the Alde-Ore Estuary throughout the year (Davis, et al., 2018). Distribution data of seabirds presented in Waggit, et al. (2019) show herring gull to be widespread within the Study Area throughout the year (**Figure 6.4.4.5.4 Herring Gull Spatial Variation in Predicted Densities (Individuals/km^2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**).

5.7.12 In the Alde-Ore Estuary SPA and SSSI, breeding herring gull colonies are mixed with lesser black-backed gull at Havergate Island and Orford Ness (Davis, et al., 2018). In

the Alde-Ore Estuary the herring gull population has experienced considerable declines, from 5,000 breeding pairs in the late 1990s to 150 breeding pairs in 2009 (cited in Davies, et al. (2018)).

5.7.13 Herring gull is considered to be of high value due to being a qualifying feature of the Alde-Ore Estuary SPA.

Black-headed gull

5.7.14 Black-headed gull is a breeding feature of both the Minsmere-Walberswick Ramsar site and the Alde-Ore Estuary SSSI (Table 5.9). A large number of nests are thought to be present in these sites (e.g., 2,558 nests in Minsmere-Walberswick Ramsar site), with 23 pairs also known to have bred on Orford Ness in 2018, which is a decrease from previous years (Natural England, 2021). Black-headed gull is one of the most widely distributed breeding seabirds around the UK, and despite being a breeding feature of the Minsmere-Walberswick Ramsar site and the Alde-Ore Estuary SSSI, it can be found in high numbers throughout the year (JNCC, 2021). The foraging range of black-headed gull (18.5 km; Woodward, Thaxter, Owen, & Cook. (2019)) suggests it is likely that this species will be present along the Offshore Scheme at the Suffolk coast during the breeding season, as well as throughout the Study Area, including the Kent landfall.

5.7.15 Due to being a breeding feature of the Ramsar site and SSSI, black-headed gull is considered to be of high value.

Mediterranean gull

5.7.16 Mediterranean gull is a breeding qualifying feature of the Minsmere-Walberswick Ramsar site and the Alde-Ore Estuary SPA (Table 5.9). The species is considered to be present in UK waters throughout the year, with a more widespread distribution in the winter (British Trust for Ornithology, 2023). However, the species is known to be present in these two designated sites in only small numbers (for example, there are only considered to be two occupied nests in the Minsmere-Walberswick Ramsar site).

5.7.17 Mediterranean gull is considered to be the most recent addition to the population of breeding seabirds in the UK, with most breeding colonies occurring on the south and south-east coasts of the UK (JNCC, 2021). Breeding pairs in the UK increased from approximately 100 pairs in 2000, to 600-700 pairs in 2010.

5.7.18 However, the foraging range of Mediterranean gull (20 km; Woodward, Thaxter, Owen, & Cook (2019)) suggests that this species is likely to be present in small numbers throughout the Offshore Scheme, particularly during foraging trips.

5.7.19 Due to being a breeding qualifying feature of the Ramsar site and SPA, Mediterranean gull is considered to be of high value.

Common gull

5.7.20 Breeding common gull is a qualifying feature of the Alde-Ore Estuary SSSI, albeit it very low numbers, with breeding colonies predominantly confined to Scotland and Northern Ireland (JNCC, 2021). During the breeding season, the species can be found both in colonies and nesting solitarily. The highest numbers of common gull in the UK can be found in the winter rather than the summer, when a high proportion of individuals arrive from the continent (British Trust for Ornithology, 2023). Thus, the non-breeding population is larger than the breeding population. Therefore, the presence of common gull in the Study Area during the breeding season is considered to be limited.

5.7.21 Due it being a qualifying feature of the SSSI, common gull is considered to be of high value.

Terns

5.7.22 Breeding populations and/or foraging grounds of little tern, common tern, sandwich tern and arctic tern are protected by several designated sites within the Study Area (Table 5.9). The foraging ranges of all four species (Woodward, Thaxter, Owen, & Cook, 2019) suggest individuals associated with SPAs that are not directly intersected by the Offshore Scheme may nevertheless be present within the Offshore Scheme whilst foraging. However, potential abundance of foraging terns is likely to be higher within the Offshore Scheme at locations closer to the nesting colonies. A previous study mapped the use of foraging habitat by tern species (Wilson, et al., 2014). The SPAs of interest in this baseline were not assessed, however results of foraging habitat usage across SPAs around the UK were consistent, showing that the highest usage was in the direct vicinity of the breeding colony. Usage decreased with distance from the colony, suggesting the presence of tern species within the Offshore Scheme is most likely to occur in sections of the route that are close to coastal areas of the SPAs. All SPAs designated for the protection of breeding tern species outlined in Table 4.6.10 are situated along the coastline.

5.7.23 The numbers of breeding little tern pairs in the Minsmere-Walberswick SPA, for which it is designated, were assessed as low compared to breeding colonies elsewhere in the UK during work to quantify marine environment usage by little terns around their colonies (Parsons, Lawson, Lewis, Lawrence, & Kuepfer, 2015). Despite this, an estimation of foraging extent suggests little tern from this SPA could be foraging within the Offshore Scheme (Plate 5.1; Natural England and JNCC (2015)).

5.7.24 The Alde-Ore Estuary SPA and Thanet Coast and Sandwich Bay SPA are considered to no longer be regularly occupied by tern species (Wilson, et al., 2014; Natural England and JNCC, 2015). Alde-Ore Estuary SPA previously held 2% and 1.2% of the Great British breeding populations of little tern and sandwich tern respectively (Webb, et al., 2009). Similarly, arctic tern has previously been considered to breed on Havergate Island within Alde-Ore Estuary SPA and SSSI (Natural England, 1996), however there is very little recent evidence to confirm this is still the case. The Alde-Ore Estuary SPA is the only site within the study area that is designated for the protection of breeding sandwich tern. Thus, the presence of sandwich tern within the Offshore Scheme is expected to be limited, with the potential being restricted to occasional visitors in small numbers.

5.7.25 For little tern, any individuals present within the Offshore Scheme are expected to be from the Sandwich Bay to Hacklinge Marshes SSSI rather than from the Alde-Ore Estuary SPA or Thanet Coast and Sandwich Bay SPA. However, small numbers of occasional visitors may occur.

5.7.26 The Outer Thames Estuary SPA is designated to protect important foraging grounds for common tern and little tern visiting from surrounding breeding colonies. The nearest designated site for common tern is Foulness (Mid-Essex Coast Phase 5) SPA located approximately 38.4 km away, and thus outside of the foraging range of the species (Woodward, Thaxter, Owen, & Cook, 2019). However, the Seabird 2000 Census (Mitchell, Newton, Ratcliffe, & Dunn, 2004) showed that common tern is present along much of the south east coast of England, including in proximity to the Suffolk landfall. Thus, it is possible that common tern may be found foraging in the Outer Thames Estuary SPA within the Offshore Scheme where it approaches the Suffolk coast. Little

tern, in small numbers, may also occasionally be present within the Offshore Scheme in the Outer Thames Estuary SPA during foraging trips from its relevant designated sites.

5.7.27 Little tern, common tern and sandwich tern are considered to be of high value.

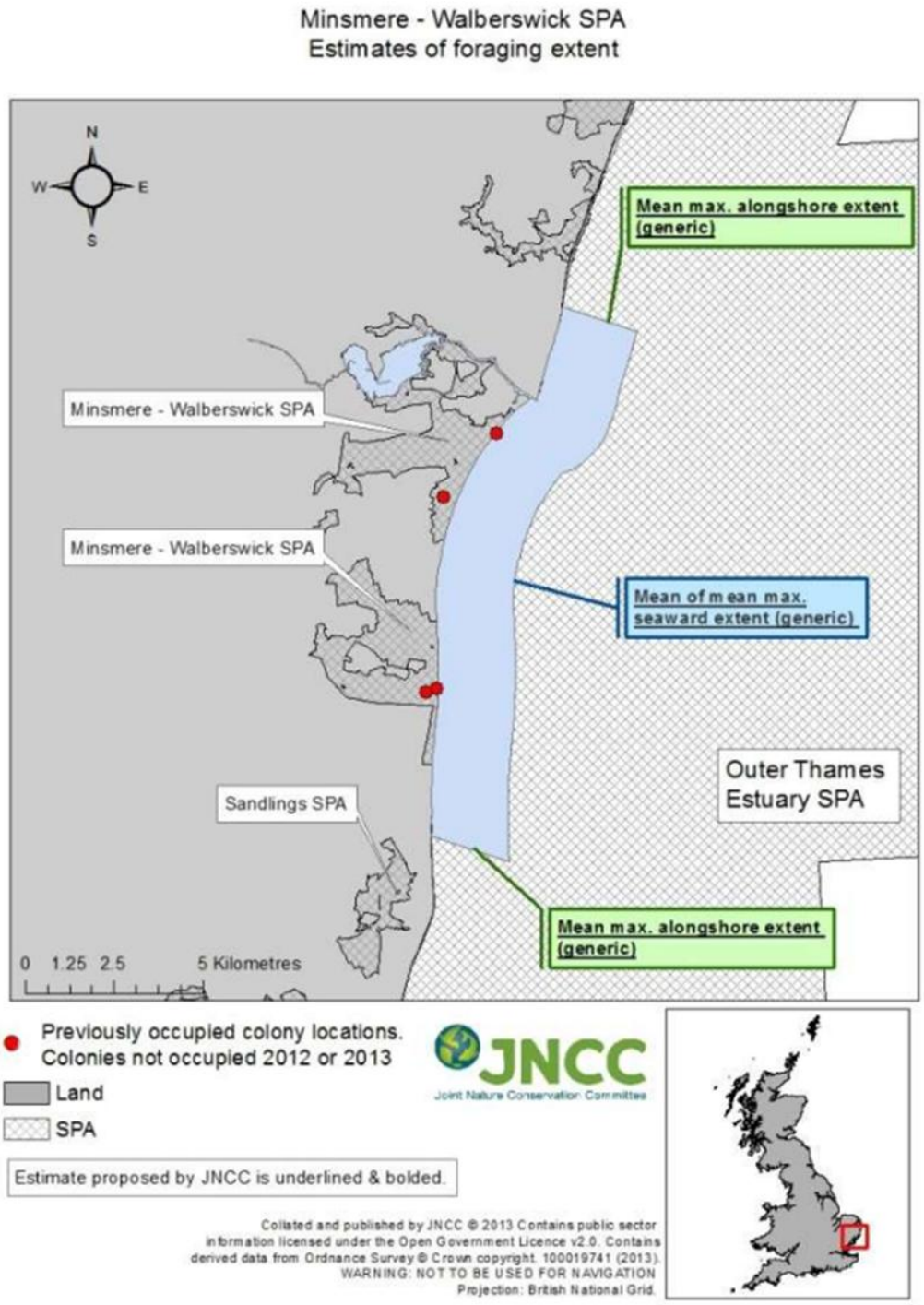

Plate 5.1 Estimation of foraging extent of little terns from the Minsmere-Walberswick SPA

5.7.28 A summary of the status and distribution of seabirds within the Study Area during the breeding season, is provided in Table 5.11.

Table 5.11 Presence and seasonal distribution of seabirds within the study area during the breeding season

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
Lesser black-backed gull	High	Qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary Ramsar, which support 11.3% of the GB breeding population during the breeding season (JNCC, 2015). Breeding and nesting sites are found on offshore islands and next to freshwater inland waterbodies, as well as on coastal cliffs and in saltmarshes (JNCC, 2021). The main breeding period is from May – June (Schwemmer & Garthe, At-sea distribution and behaviour of a surface feeding seabird, the lesser black-backed gull Larus fuscus, and its association with different prey, 2005). Typically, its diet consists of fish and crustaceans.	**Yes**. Density distribution maps produced by Waggit et al. (2019) show this species to be present throughout the Study Area, including the Offshore Scheme due to their long foraging range, with a hotspot located around the Alde-Ore Estuary SPA and Ramsar near the Suffolk landfall.
Herring gull	High	Qualifying feature of the Alde-Ore Estuary SPA and SSSI sites and are present in the Study Area throughout the year despite being breeding features of these sites (Davis, et al., 2018). The number of breeding pairs has declined in	**Yes**. Density distribution maps produced by Waggit et al. (2019) show this species to be present throughout the Study Area, including the Offshore Scheme throughout the year due to their

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
		recent years, but the species is considered to be most abundant around Havergate Island and Orford Ness. Nests are typically found on rocky coastlines with cliff but can also be found in sand dunes and shingle banks (JNCC, 2021).	long foraging ranges, with a concentration around Alde-Ore Estuary.
Black-headed gull	High	This species is a qualifying feature of the Minsmere-Walberswick Ramsar and Alde-Ore Estuary SSSI, with large numbers of nests known to occur in both sites (Natural England, 2021). It is one of the most widely distributed breeding seabirds in the UK and is present throughout the year, nesting on open ground in wetlands and marshes (JNCC, 2021).	**Yes**. Due to their wide-ranging distribution around the UK and their presence in the Minsmere-Walberswick Ramsar and Alde-Ore Estuary SSSI, as well as their long foraging ranges, this species is expected to be present throughout the Study Area, including the Offshore Scheme throughout the year.
Mediterranean gull	High	A qualifying feature of the Minsmere-Walberswick Ramsar and Alde-Ore Estuary SPA, this species has a widespread distribution around the UK throughout the year. However, during the breeding season, it is considered to be present in small	**Yes**. During the breeding season, they are expected to be present in the Study Area, including the Offshore Scheme in small numbers, potentially up to 20 km away from their breeding sites.

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
		numbers (British Trust for Ornithology, 2023). Breeding is thought to mostly occur on the south and south east coasts of England (JNCC, 2021).	
Common gull	High	Qualifying feature of the Alde-Ore Estuary SSSI, albeit in very low numbers. Although this is a breeding feature, common gull is most abundant in the UK in the winter months and is widespread around the UK coastline (British Trust for Ornithology, 2023). Breeding is considered to be predominantly in Scotland and Northern Ireland (JNCC, 2021). Common gull commonly nest on coastlines and in inland habitats (JNCC, 2021).	**No**. Due to limited breeding numbers in the south-east of England, particularly along the Suffolk and Kent coasts, the species is unlikely to occur regularly in substantial numbers within the Study Area.
Little tern	High	Qualifying feature of the Outer Thames Estuary SPA, Thanet Coast and Sandwich Bay SPA, Thanet Coast and Sandwich Bay Ramsar, Sandwich and Pegwell Bay NNR, Sandwich Bay to Hacklinge Marshes SSSI, Minsmere-Walberswick SPA, Alde-Ore Estuary SPA, Alde-Ore	**Yes**. Little tern is likely to be present in the Study Area, where the Offshore Scheme passes through sites designated for the protection of the species along the coast. However, presence is expected to be limited to small numbers of individuals from Sandwich Bay to Hacklinge Marshes SSSI at the

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
		Estuary Ramsar and Alde-Ore Estuary SSSI. The number of little tern has been declining in the UK since the 1980s, with number of fledged chicks per pair also decreasing (JNCC, 2021). Breeding has stopped completely in the Sandwich and Pegwell Bay NNR (Kent Wildlife Trust, 2023). Numbers have declined in the Minsmere-Walberswick SPA, and the Alde-Ore Estuary SPA, Ramsar and SSSI, and Thanet Coast and Sandwich Bay SPA are no longer considered regularly occupied by the species (Natural England and JNCC, 2015). However, Thanet Coast and Sandwich Bay SPA is still considered to support 0.3% of the GB little tern breeding population (JNCC, 2015). This compares to 19.64% of the GB population protected by the Outer Thames Estuary SPA (JNCC, 2020). This was made up of 746 individuals between 2011 – 2015 (Natural England and JNCC, 2015). Breeding pairs are also believed to remain in Sandwich Bay to	Pegwell Bay landfall and foraging within the Outer Thames Estuary SPA close to the Suffolk landfall, during the breeding season.

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
		Hacklinge Marshes SSSI (Natural England, n.d.). Little tern uses nesting sites which are typically sand and shingle beaches on the coast as well as spits (Natural England and JNCC, 2015), and has the shortest foraging range out of all three tern species considered in this baseline, staying in close range to its breeding sites. Its diet consists of small fish and invertebrates (JNCC, 2021).	
Common tern	High	The Outer Thames Estuary SPA protects important foraging areas for 2.66% of the GB common tern population during the breeding season (JNCC, 2020). There were 532 individuals present between 2011-2015 (Natural England and JNCC, 2015). Common tern is also a qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary SSSI, although the Alde-Ore Estuary is no longer considered to be regularly occupied by tern species (Wilson, et al., 2014; Natural England and JNCC, 2015). Breeding and nesting sites are confined to low lying ground on the	**Yes**. Common tern is likely to be present in the Study Area, including the Offshore Scheme when foraging in the Outer Thames Estuary SPA near the Suffolk landfall during the breeding season.

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature (IEF)
		waters edge on both the coast and next to freshwater bodies (JNCC, 2021).	
Arctic tern	High	Qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary SSSI with previous breeding observed on Havergate Island (Natural England, 1996), however there is very little recent evidence of breeding arctic tern to confirm that it is still a regular user of these sites. The species' distribution is more concentrated in Scotland and the north of England (JNCC, 2021).	**No**. Due to the species' more northerly distribution and lack of evidence for recent breeding activity in the Alde-Ore Estuary, presence in the Study Area is expected to be limited to very occasional visitors, potentially during the breeding season.
Sandwich tern	High	Qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary Ramsar. However, tern species are no longer considered to be regular users of these sites (Wilson, et al., 2014). The UK population of sandwich tern is now confined to a small number of large colonies with high densities of nesting birds (JNCC, Sandwich tern (Sterna sandvicensis), 2021). The highest densities of sandwich tern are found at coastal breeding sites between March – August.	**No**. Due to the limited abundance of this species in the Alde-Ore Estuary SPA and Ramsar, presence in the Study Area is expected to be limited to occasional visitors during foraging trips during the breeding season.

Breeding Waterbirds

5.7.29 As set out in sections 5.4.4 and 5.4.5 and Table 5.7, surveys undertaken at the landfall locations did not record the presence of any breeding birds, notably waterbirds or seabirds, which could interact with the marine elements of the Offshore Scheme. Further details on breeding bird assemblages relevant to the wider Proposed Project are set out in **Application Document 6.3.2.2.C Appendix 2.2.C Suffolk Breeding Birds 2023 and 2024, Application Document 6.3.3.2.D Appendix 3.2.D Kent Breeding Birds 2023,** and **Application Document 6.3.3.2.E Appendix 3.2.E Kent Breeding Birds 2024**.

Non-Breeding Seabirds and Waterbirds

Red-throated diver

5.7.30 The Offshore Scheme passes through the Outer Thames Estuary SPA in two locations for approximately 29 km. Firstly, as the Offshore Scheme leaves the Suffolk landfall and secondly, midway along the route of the Offshore Scheme at the outer reaches of the Thames Estuary. The Outer Thames Estuary SPA is designated, in part, for the protection of foraging areas for non-breeding red-throated diver. Red-throated diver typically arrive in UK coastal waters in September with numbers declining by February, although the main period of occurrence in coastal offshore waters is from October to March (O'Brien, Webb, Brewer, & Reid, 2012). They feed on a wide variety of fish, which they catch by diving from the surface and pursuing their prey underwater. The population of red-throated diver within the Outer Thames Estuary SPA is estimated at 22,280 ± 4293 individuals (± Standard Deviation (SD)), with a density of 5.68 individuals/km^2 (Natural England, 2019). This is an increase on the estimate of 6,466 individuals provided in 2010 (Natural England and JNCC, 2010).

5.7.31 Aerial surveys conducted by Natural England and HiDef in 2018 to assess population and distribution of red-throated diver in the Outer Thames Estuary SPA show that the species is present in high densities throughout much of the SPA including both shallower and deeper waters, with areas of lower density typically associated with the presence of wind farms in the southern North Sea, i.e., birds are displaced from the area of the wind farm array and immediate area surrounding the array (Natural England, 2019) (**Figure 6.4.4.5.5 Red throated diver counts (individuals) and densities (number km^2) in the Outer Thames Estuary SPA** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**).

5.7.32 Surveys conducted as part of the construction of OWFs outside the Outer Thames Estuary SPA have also recorded red-throated diver. The Thanet Extension OWF recorded a peak of 194 individuals within the site in the wintering season (December to January) with a density of 2.66 individuals/km^2 (Vattenfall, 2018c). Red-throated diver has also been recorded foraging offshore in Pegwell Bay during a survey of intertidal ornithology as part of the Thanet Extension OWF (Vattenfall, 2018c). However, whilst red-throated diver is likely to be sporadically recorded along the entirety of the Offshore Scheme during the non-breeding season, those areas intersecting with the Outer Thames Estuary SPA are likely to have higher numbers, as these areas have been shown to regularly support the species and represent important foraging areas.

Due to its sensitivity, red-throated diver is considered to be of high value.

Gull species

5.7.33 Several gull species are considered likely to be present in the Study Area during the winter, based on a literature review of reports produced for existing infrastructure (Table 5.10). These are: herring gull, common gull, little gull, great black-backed gull, lesser black-backed gull, and kittiwake.

5.7.34 The review of data for the Study Area suggests that gull species are widespread during the winter months, as set out previously in Table 5.10. Herring gull increases in numbers considerably in the winter months compared to summer, shown by distribution data (**Figure 6.4.4.5.4 Herring Gull Spatial Variation in Predicted Densities (Individuals/km^2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**) (Waggit, et al., 2019)) and is likely to be present throughout the study area and Offshore Scheme during the non-breeding season. This is supported by non-breeding bird surveys conducted at the Kent and Suffolk landfalls, which recorded substantial numbers of herring gull during the wintering period (peak counts of 430 individuals in Kent (on the high tide) and 40 individuals in Suffolk).

5.7.35 Common gull increases in numbers around the UK in the winter compared to the summer. As a result, it has a very widespread winter distribution around the UK (British Trust for Ornithology, 2023). Due to its widespread distribution during the non-breeding season common gull is expected to be present throughout the Offshore Scheme, albeit in low numbers (Waggit, et al., 2019). Wintering bird surveys at the Kent landfall identified common gull on both high and low tides in small numbers.

5.7.36 Little gull is the smallest gull species globally (Natural England, 2012) but has a limited non-breeding distribution in the North Sea, with peak numbers of individuals occurring in early autumn off the east coast (Schwemmer & Garthe, 2006). Due to its limited offshore presence, it is not expected to be present in large numbers in the Offshore Scheme.

5.7.37 Great black-backed gull is widely distributed around the North Sea coast in the non-breeding season (RSBP, 2023) and is therefore likely to be present in the Offshore Scheme in low numbers, particularly at coastal locations. This includes both the Kent and Suffolk landfalls where great black-backed gulls has been recorded in wintering bird surveys. Great black-backed gull was recorded in higher numbers at the Kent landfall, with a low-tide peak of 230 individuals, compared to 40 individuals in Suffolk.

5.7.38 Lesser black-backed gull is widely distributed around the North Sea coast in the non-breeding season, although in low numbers as many birds winter in southern Europe and North Africa (**Figure 6.4.4.5.3 Lesser Black-backed Gull Spatial Variation in Predicted Densities (individuals/km^2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**); (Waggit, et al., 2019). Therefore, the species is likely to be present in the Offshore Scheme in low numbers, particularly at coastal locations. This is supported by low numbers of lesser black-backed gulls recorded at both landfall locations in wintering bird surveys.

5.7.39 Kittiwake is present in the North Sea and the Study Area throughout the year, with numbers increasing in the wintering period (Waggit, et al., 2019). During the winter, kittiwake spend most of their time out at sea (RSBP, 2023). Several different breeding populations mix together during the winter (Frederiksen, et al., 2012). Kittiwake is expected to be present throughout the Offshore Scheme throughout the non-breeding period, albeit in low numbers.

5.7.40 Gull species present in the Study Area during the non-breeding season are considered to be of low value.

Guillemot

5.7.41 Non-breeding guillemot is likely to be present in the Offshore Scheme, in low densities (Waggit, et al., 2019). Guillemots spend their life at sea, spending the winter in waters well offshore, and only come to land to nest (RSPB, 2023). Therefore, this species is only likely to occur sporadically within the Offshore Scheme.

5.7.42 Guillemot are considered to be of low value.

Razorbill

5.7.43 Razorbill is most commonly known to breed on the Atlantic coast of Europe (JNCC, 2021). However, a review of data from existing infrastructure in the Study Area (Table 5.10) showed that this is also a widespread non-breeding species in the North Sea, including the Study Area (**Figure 6.4.4.5.6 Razorbill Spatial Variation in Predicted Densities (Individuals/km^2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**) (Waggit, et al., 2019)). Density distribution shows that a high density of razorbill extends out into the offshore sections of the North Sea (**Figure 6.4.4.5.6 Razorbill Spatial Variation in Predicted Densities (Individuals/km^2) in January and July** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**) (Waggit, et al., 2019)). Therefore, this species is likely to occur within the Offshore Scheme, although sporadically and in low numbers.

5.7.44 Razorbill are considered to be of low value.

Table 5.12 Presence and seasonal distribution of seabirds and waterbirds within the study area during the non-breeding season

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature
Red-throated diver	High	Within the Outer Thames Estuary SPA, this species is wide-ranging with high densities in both shallow and deeper waters. Average density in the SPA is 5.68 individuals/km^2, with the Offshore Scheme falling within foraging areas for the species. Red-throated diver is also present beyond the boundaries of the SPA, having been recorded in both intertidal and offshore habitats near Pegwell Bay.	**Yes**. Red-throated diver is expected to be present throughout the Offshore Scheme both within and outside of the Outer Thames Estuary SPA boundary with numbers peaking between December and January.
Gull species	Low	Non-breeding herring gull, common gull, lesser black-backed gull and kittiwake are considered to have a widespread distribution in the North Sea during the wintering period, partly due to their long foraging ranges. Non-breeding little gull and great black-backed gull are considered to be present in smaller numbers with a greater onshore presence.	**Yes**. Non-breeding herring gull, common gull, lesser black-backed gull and kittiwake are expected to be widespread throughout the Offshore Scheme during the non-breeding season. Non-breeding little gull and great black-backed gull are considered to have very little presence in the Offshore Scheme during the non-breeding season.
Guillemot	Low	Wintering guillemot spend a large proportion of their time at sea and	**Yes**.

Receptor	Value	Summary of Data Relevant to the Study Area	Regular presence in the Study Area and taken forward as an Important Ecological Feature
		only come to land to nest. Numbers increase in the winter, with individuals exhibiting larger foraging distances.	Due to their offshore presence in the North Sea and Study Area, non-breeding guillemot are expected to be present throughout the Offshore Scheme.
Razorbill	Low	Razorbill has a much larger wintering presence in the North Sea compared to the breeding season, with its distribution extending into offshore waters as a result of its foraging range.	**Yes**. Due to their offshore presence, non-breeding razorbill are considered to be present throughout the Offshore Scheme.

Coastal and Intertidal Water Birds

5.7.45 Data relevant to the Offshore Scheme are summarised in Tables 5.13 and 5.14. These data focus on non-breeding bird surveys undertaken at Pegwell Bay between October 2022 and March 2023 and October 2023 and March 2024.

5.7.46 The key findings from the surveys were as follows:

- General waterbird assemblage – Waterbirds congregated at high water to roost on the saltmarsh and sand banks at the mouth of the River Stour. This location regularly supported large numbers (>100 individuals) of Bar-tailed Godwit, Cormorant, Curlew, Dunlin, Golden Plover, Lapwing, Oystercatcher, Redshank, Sanderling and Wigeon, throughout the survey period. In addition, occasional high tide roosts were noted on the lagoon adjacent to the coast path.
- General waterbird assemblage - Over the low water period waterbirds were widely distributed across the intertidal mudflats within the survey area, with movements and occurrence broadly following the inundation and re-exposure of the mudflats as it become available as a feeding resource. Species regularly recorded in larger numbers (>100 individuals) included Curlew, Dunlin, Golden Plover, Lapwing, Oystercatcher, Sanderling and Wigeon.
- The following species were recorded in significant numbers:
  - Cormorant – the peak count of 690 individuals in 2022/23 exceeds the 1% GB threshold (620 individuals).
  - Golden Plover – the peak count of 421 individuals in 2023/24 represents over 100% of the Thanet Coast and Sandwich Bay SPA population (411 individuals).
  - Sanderling – the peak count of 413 individuals exceeds the 1% GB threshold (200 individuals)

Table 5.13 Peak count of all waterbird species recorded during surveys in 2022/23 and 2023/24 at the Kent landfall (Pegwell Bay)

Species	Year	Tide	Month							Notes on occurrence (where available)
			October	November	December	January	February	March	Peak Count	
Avocet	2022/23	HT	0	0	2	0	0	0	2	Recorded as individuals or small groups, primarily in association with the coastal lagoon.
		LT	0	0	1	0	0	0	1	
	2023/24	HT	0	0	2	0	2	2	2	Two recorded in coastal lagoon during December and January visits.
		LT	0	0	0	0	2	2	2	
Bar-tailed Godwit	2022/23	HT	39	60	12	205	0	0	205	Frequent mid-size (20-110) flocks foraging on mudflats at low tide and in proximity to River Stour mouth.
		LT	11	1	0	43	0	0	43	
	2023/24	HT	0	3	71	0	0	0	71	Recorded during November and December visits, as small groups generally foraging on exposed mudflats. Peak count of 70 birds during December high tide count from adjacent to River Stour mouth.
		LT	0	10	0	0	0	0	10	
Black-headed Gull	2022/23	HT	37	0	91	292	126	32	292	Recorded on every survey and present throughout, often resting on exposed mudflats or foraging along tide line during low tide.
		LT	61	58	74	716	441	105	716	
	2023/24	HT	28	171	385	29	634	27	634	Count of over 800 birds in December, with counts on other visits of several hundred individuals.
		LT	15	4	835	384	590	205	835	
Black-tailed Godwit	2022/23	HT	0	104	5	5	8	0	104	Small group present on coastal lagoon throughout winter period.
		LT	5	1	0	0	0	5	5	
	2023/24	HT	39	6	25	0	0	0	39	Recorded at high tide only as a group of six to 39 birds, often roosting on coastal lagoon or nearby saltmarsh edge.
		LT	0	0	0	0	0	0	0	
Brent Goose (Dark-bellied)	2022/23	HT	50	11	0	53	6	0	53	Consistently recorded as small groups on most surveys but generally fewer than 20 individuals. Present on mudflats, along River Stour mouth and along the tideline.
		LT	46	8	0	2	0	7	46	

Species	Year	Tide	Month							Notes on occurrence (where available)
	2023/24	HT LT	31 65	0 3	2 51	55 55	40 0	17 11	55 65	Frequently recorded on exposed mudflats with counts often in the region of 40 to 65 birds.
Caspian Gull	2022/23	HT LT	0 0	0 0	1 0	0 0	0 0	1 0	1 0	Single bird recorded during December counts.
	2023/24	HT LT	0 0	1 0	0 0	0 0	0 0	0 0	1 0	Single bird recorded within River Stour mouth gull roost in November.
Common Gull	2022/23	HT LT	39 5	27 1	7 0	19 26	0 62	8 26	39 62	Small groups present as part of most gull aggregations but in smaller numbers than most other species.
	2023/24	HT LT	1 50	8 0	529 60	27 2	116 0	0 50	529 60	Large counts of over 500 individuals during December high tide and over 100 individuals during February high tide, in contrast to the usual recording of a few or approximately 50 birds mixed with other more abundant gull species.
Cormorant	2022/23	HT LT	0 20	0 2	37 0	528 690	31 50	3 0	528 690	-
	2023/24	HT LT	10 6	12 6	0 39	0 12	440 5	5 5	440 39	-
Curlew	2022/23	HT LT	112 185	50 68	72 158	114 192	212 238	52 140	212 238	Recorded in large numbers on each survey (100-180 individuals). Foraging along tideline and on mudflats with occasional large roosts on saltmarsh near to shore in centre of Survey Area and along River Stour.
	2023/24	HT LT	134 86	26 126	640 273	200 89	306 271	125 127	640 273	Peak count of 640 birds recorded during December high tide visit. Frequently recorded as several hundred birds roosting on saltmarsh edge and River Stour mouth or foraging on mudflats and along tideline.
Dunlin	2022/23	HT LT	291 600	2,460 837	818 1,312	529 461	415 210	110 0	2,460 1,312	Large flocks recorded on mudflats (flocks between 100-700) and in proximity to River Stour mouth.
	2023/24	HT LT	102 140	300 450	435 1,014	0 389	511 675	39 14	1,714 1,014	Counts of 300-500 birds were recorded on visits during November and February while large counts in December and January approached or slightly exceeded 1,000. October and March

Species	Year	Tide	Month							Notes on occurrence (where available)
										counts generally of small groups of birds fewer than 20.
Gadwall	2022/23	HT LT	2 0	0 0	0 0	0 0	0 0	25 8	25 8	Peak count of 25 individuals on March high tide count but generally absent or present as singles.
	2023/24	HT LT	0 0	12 12	0 0	0 0	0 0	0 0	12 12	Recorded during November only as group of 12 individuals on coastal lagoon.
Golden Plover	2022/23	HT LT	38 17	307 207	0 0	190 11	80 0	0 0	307 207	Recorded either in small groups or flocks of 200-350 individuals regularly during both high and low tide
	2023/24	HT LT	0 0	8 236	0 421	0 203	25 120	0 0	2 421	Foraging flocks in the region of 200-400 individuals recorded at low tide during November through to January, with a small group of eight individuals also recorded during November high tide.
Great Black-backed Gull	2022/23	HT LT	115 111	518 461	470 346	40 61	4 58	0 0	518 461	Large roost (500 individuals) in association with cormorants noted at both high and low tide (though larger number at high) at mouth of River Stour.
	2023/24	HT LT	450 260	372 530	170 540	0 12	104 26	30 12	450 540	Large roost present along banks of River Stour mouth, counts in the region of 500 or several hundred frequently recorded.
Great Crested Grebe	2022/23	HT LT	0 0	0 0	1 0	1 0	1 0	0 0	1 0	Singles recorded on occasion in open water of Pegwell Bay.
	2023/24	HT LT	0 0	3 0	0 0	0 0	0 0	2 0	3 0	Two to three birds recorded during November and March surveys.
Grey Plover	2022/23	HT LT	0 13	0 70	39 28	27 3	89 0	43 2	89 70	Recorded in either small groups on most surveys with a peak count of 89 individuals recorded in February.
	2023/24	HT LT	0 8	17 37	234 0	5 11	1 2	12 2	234 37	Count of over 230 birds on December high tide, in contrast to the usual recording of this species as small groups usually totalling 10 to 20 birds.
Herring Gull	2022/23	HT LT	59 123	90 298	293 344	78 121	0 43	0 0	293 344	Foraging and roosts over several hundred birds consistently recorded along River Stour and

Species	Year	Tide	Month							Notes on occurrence (where available)
										tideline with smaller numbers foraging upon exposed mudflats.
	2023/24	HT LT	12 158	24 0	430 300	0 66	0 57	166 150	430 300	Largest counts of 430 and 300 birds recorded during December but recorded frequently as small groups or totals in the region of 150 birds. Often at tideline or roosting with other gulls along the banks of the River Stour.
Knot	2022/23	HT LT	0 0	92 0	44 110	0 0	55 0	0 0	92 110	Recorded during three high tide surveys as flocks between 44 and 92 birds and once as a foraging flock at low tide of c.110 birds.
	2023/24	HT LT	0 0	30 5	1 2	0 4	0 0	35 0	35 5	Generally recorded as small groups in smaller numbers than other small waders (e.g., dunlin and sanderling).
Lapwing	2022/23	HT LT	15 13	102 203	0 1	1 0	738 733	5 0	738 733	Large numbers (700 individuals) occasionally recorded on the edge of the coastal lagoon, especially at high tide.
	2023/24	HT LT	0 0	100 3	1,650 2,244	0 1,260	2,500 1,414	0 0	2,500 2,244	A peak count of 2,500 individuals during the February high tide is the highest of several counts in the region of 1,000-2,000 individuals between December and February. Lapwing was either absent or present in much reduced numbers during other visits.
Lesser Black-backed Gull	2022/23	HT LT	18 24	0 25	99 343	1 4	0 0	25 32	99 343	Regularly recorded gull on both high and low tide but in notably smaller numbers than great black-backed and herring gulls. Notable large count of over 300 birds during December low tide.
	2023/24	HT LT	5 27	12 0	30 0	0 0	0 0	0 0	30 27	Recorded in small numbers of 30 individuals or fewer during October to December, often mixed with other gull species.
Little Egret	2022/23	HT LT	3 3	1 2	2 0	2 1	0 0	0 0	3 3	Individuals and small groups frequently recorded on coastal lagoon and salt marsh.
	2023/24	HT LT	12 1	10 9	2 3	1 1	3 1	1 0	12 9	Consistently recorded using coastal lagoon and saltmarsh fringe with several counts of ten birds or more.
Oystercatcher	2022/23	HT LT	569 672	628 651	2,152 1,716	540 345	1,880 1,383	620 621	2,152 1,716	The most numerous recorded wader with a peak count of over 2,000 individuals in December.

Species	Year	Tide	Month							Notes on occurrence (where available)
										Foraging in large numbers along tide line on all surveys and recorded in large roosts along the River Stour.
	2023/24	HT LT	1,606 857	2,078 458	1,818 1,846	1,040 1,100	1,250 1,890	900 120	2,078 1,890	Peak of 2,078 individuals during November high tide. Recorded on every survey visit.
Pintail	2022/23	HT LT	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
	2023/24	HT LT	0 0	0 4	2 0	0 0	0 0	0 0	2 4	Groups of two and four birds recorded on saltmarsh fringe and mudflats during November and December.
Mallard	2022/23	HT LT	16 47	14 9	51 27	36 1	0 2	2 0	51 47	Recorded in generally small numbers on intertidal counts (both on foreshore and making use of the coastal lagoon).
	2023/24	HT LT	44 11	1 5	17 9	28 17	2 2	2 1	44 17	Recorded on every survey visit, though fluctuating in numbers from a peak of 44 during the October high tide to between 11 and 28 on other visits and as individuals only during February and March visits.
Mediterranean Gull	2022/23	HT LT	0 0	0 0	0 0	0 0	0 0	0 0	0 0	Two fly overs recorded during October low tide.
	2023/24	HT LT	0 0	0 0	4 0	0 0	0 0	0 0	4 0	Four birds recorded at high tide in December, on mudflats and within gull roosts.
Redshank	2022/23	HT LT	140 50	20 37	43 24	116 52	65 28	14 5	140 52	Frequently recorded at both high and low tide as one of the most consistently recorded wader species.
	2023/24	HT LT	98 9	50 77	41 48	21 30	90 46	33 9	98 77	Counts frequently in the region of 50 to 100 birds and present on every survey visit in at least small groups.
Red-throated Diver	2022/23	HT LT	2 4	0 0	0 0	0 0	0 0	0 0	2 4	Peak count of four individuals using the open water of Pegwell Bay in October only.
	2023/24	HT LT	0 0	0 0	0 0	0 0	0 0	0 0	0 0	-
Ringed Plover	2022/23	HT	1	0	1	0	0	0	1	Single birds only, recorded October to March.

Species	Year	Tide	Month						Notes on occurrence (where available)
		LT	0	1	0	0	0	0	1	
	2023/24	HT	0	0	0	0	0	0	0	Groups of twelve and three recorded during November and December.
		LT	0	12	3	0	0	0	12	
Turnstone	2022/23	HT	0	0	0	0	11	5	11	-
		LT	0	0	1	0	0	0	1	
	2023/24	HT	0	0	6	4	10	19	19	Small groups of two to 19 individuals recorded consistently at both high and low tide between December and March, usually on saltmarsh fringe.
		LT	0	0	2	0	2	0	2	
Sanderling	2022/23	HT	0	135	79	9	413	80	413	Regularly occurring as flocks of several hundred birds with a peak count of 413 noted during February high tide.
		LT	149	35	1	0	12	3	149	
	2023/24	HT	0	112	90	38	194	15	194	Counts of 100-200 individuals frequently recorded during November to February, both at high and low tide.
		LT	0	139	82	0	0	0	139	
Sandwich Tern	2022/23	HT	2	0	0	0	0	0	2	Two recorded during October high tide only
		LT	0	0	0	0	0	0	0	
	2023/24	HT	0	0	0	0	0	0	0	-
		LT	0	1	0	0	0	0	1	
Shelduck	2022/23	HT	2	17	71	47	108	18	108	Large groups (often 20-80) birds recorded foraging on mudflats or tide line at low tide. Aggregations within River Stour also often present at low tide.
		LT	2	12	36	57	81	13	81	
	2023/24	HT	19	0	60	0	48	8	60	Recorded on almost every survey visit, usually in small groups of 19 or fewer but in the region of 50 to 60 birds on two occasions.
		LT	11	9	9	2	16	7	16	
Shoveler	2022/23	HT	0	0	22	4	0	6	22	-
		LT	0	3	54	9	75	10	75	
	2023/24	HT	2	16	41	79	113	25	113	Recorded primarily on coastal lagoon with numbers increasing into late winter with a peak count of 113 during February high tide and counts in the region of 40 to 80 birds during other December and January visits.
		LT	12	0	41	44	66	35	66	

Species	Year	Tide	Month							Notes on occurrence (where available)
Snipe	2022/23	HT	3	0	1	0	0	0	3	Small numbers recorded in saltmarsh edge of coastal lagoon in mid-winter months.
		LT	0	0	3	0	2	0	3	
	2023/24	HT	0	11	8	1	0	0	11	Recorded between November to January as between four and 11 birds, usually in saltmarsh near coastal lagoon.
		LT	0	0	4	0	0	0	4	
Teal	2022/23	HT	35	9	27	0	22	7	35	Generally recorded on coastal lagoon or less frequently on the River stour mouth with a peak count of 62 individuals in December.
		LT	2	27	62	12	31	18	62	
	2023/24	HT	24	195	223	41	36	9	223	Counts of 195 individuals on November high tide and 223 individuals on December high tide represent large roost aggregations with other waterbirds. Recorded on other occasions usually between 10 and 40 birds on saltmarsh fringe or using coastal lagoon.
		LT	19	28	26	17	5	36	36	
Water Rail	2022/23	HT	0	0	0	0	0	0	0	-
		LT	0	0	0	0	1	0	1	
	2023/24	HT	0	2	0	0	0	0	2	-
		LT	0	0	0	1	0	0	1	
White-fronted Goose	2022/23	HT	1	0	0	0	0	0	1	Single bird recorded on October high tide only.
		LT	0	0	0	0	0	0	0	
	2023/24	HT	0	0	0	0	0	0	0	-
		LT	0	0	0	0	0	0	0	
Wigeon	2022/23	HT	182	377	307	334	355	0	377	Mid-size aggregations recorded on most surveys with large numbers (400 individuals) recorded. Wigeon tended to aggregate within the River Stour or on the tide line, though groups did use the coastal lagoon, especially at high tide.
		LT	463	443	358	153	450	0	463	
	2023/24	HT	314	810	191	206	148	56	810	Recorded on every visit. Peak count of 964 individuals during November low tide (and count of 810 individuals during November high) with multiple counts in the region of 100 – 300 birds. Usually on shoreline, mudflats or on River Stour mouth.
		LT	95	964	121	33	39	18	964	
Yellow-legged Gull	2022/23	HT	0	0	0	1	0	0	1	Single bird recorded during January counts.

Species	Year	Tide	Month							Notes on occurrence (where available)
		LT	0	0	0	1	0	0	1	
	2023/24	HT	0	0	0	0	0	0	0	-
		LT	0	0	0	0	0	0	0	

Table 5.14 Comparison of peak waterbird counts recorded during surveys in 2022/23 and 2023/24, with original Thanet Coast and Sandwich Bay SPA citation figures and current 1% thresholds for national and international importance

Species	Year	Peak Count	% of SPA citation population (where relevant)	Thanet Coast and Sandwich Bay SPA (1991/92-1995/96)	Thanet Coast and Sandwich Bay Ramsar site (1998/99-2002/3)	Latest WeBS Core count Pegwell Bay 18/19-23 five year mean peak	Great Britain 1% threshold	International 1% tthreshold
Avocet	2022/23 2023/24	2 2				19	87	940
Bar-tailed godwit	2022/23 2023/24	205 71				173	500	1,500
Black-headed Gull	2022/23 2023/24	716 835				3,299	22,000	20,000
Black tailed godwit	2022/23 2023/24	104 39				38	390	1,100
Brent Goose (Dark-bellied)	2022/23 2023/24	53 65				118	980	2,100
Caspian Gull	2022/23 2023/24	1 1				1	1	3,200
Common Gull	2022/23 2023/24	62 529				541	7,000	16,400
Cormorant	2022/23 2023/24	690 440				846	620	1,200
Curlew	2022/23 2023/24	238 640				450	1,200	7,600
Dunlin	2022/23 2023/24	2,460				848	3,400	13,300
Gadwall	2022/23	25				26	310	1,200

Species	Year	Peak Count	% of SPA citation population (where relevant)	Thanet Coast and Sandwich Bay SPA (1991/92-1995/96)	Thanet Coast and Sandwich Bay Ramsar site (1998/99-2002/3)	Latest WeBS Core count Pegwell Bay 18/19-23 five year mean peak	Great Britain 1% threshold	International 1% tthreshold
	2023/24	12						
Golden Plover	2022/23 2023/24	307 421	74.7 <100	411	*4,190*	436	4,000	9,300
Great Black-backed Gull	2022/23 2023/24	518 540				532	760	3,600
Great Crested Grebe	2022/23 2023/24	1 3			*218*	7	170	6,300
Grey Plover	2022/23 2023/24	89 234				197	330	2,000
Herring Gull	2022/23 2023/24	344 430				1,395	7,300	10,200
Knot	2022/23 2023/24	110 35				94	2,600	5,300
Lapwing	2022/23 2023/24	738 2,500				2,169	6,200	20,000
Lesser Black-backed Gull	2022/23 2023/24	343 30				526	1,200	5,500
Little Egret	2022/23 2023/24	3 12				31	110	1,100
Oystercatcher	2022/23 2023/24	2,152 2,078				1,256	2,900	8,200
Pintail	2022/23 2023/24	0 4				7	200	600
Mallard	2022/23 2023/24	51 44				77	6,700	20,000

Species	Year	Peak Count	% of SPA citation population (where relevant)	Thanet Coast and Sandwich Bay SPA (1991/92-1995/96)	Thanet Coast and Sandwich Bay Ramsar site (1998/99-2002/3)	Latest WeBS Core count Pegwell Bay 18/19-23 five year mean peak	Great Britain 1% threshold	International 1% tthreshold
Mediterranean Gull	2022/23 2023/24	0 4				142	40	2,400
Redshank	2022/23 2023/24	140 98				191	940	2,400
Red-throated Diver	2022/23 2023/24	4 0						
Ringed Plover	2022/23 2023/24	1 12			*649*	65	420	540
Turnstone	2022/23 2023/24	11 19	1.2 2.0	940	1,007	6	400	1,400
Sanderling	2022/23 2023/24	413			*598*	205	200	2,000
Sandwich Tern	2022/23 2023/24	2 1				600	1	1,700
Shelduck	2022/23 2023/24	108 60				145	470	2,500
Shoveler	2022/23 2023/24	75 113						
Snipe	2022/23 2023/24	3 11				70	10,000	20,000
Teal	2022/23 2023/24	62 223				298	4,300	5,000
Water Rail	2022/23 2023/24	1 2				3	-	6,400
White-fronted Goose	2022/23 2023/24	1 0						

Species	Year	Peak Count	% of SPA citation population (where relevant)	Thanet Coast and Sandwich Bay SPA (1991/92-1995/96)	Thanet Coast and Sandwich Bay Ramsar site (1998/99-2002/3)	Latest WeBS Core count Pegwell Bay 18/19-23 five year mean peak	Great Britain 1% threshold	International 1% tthreshold
Wigeon	2022/23	463				821	4,500	14,000
	2023/24	964						
Yellow-legged Gull	2022/23	1						
	2023/24	0						

Important Ecological Features

5.7.47 Table 5.15 summarises the Important Ecological Features (IEFs) that are relevant to the Offshore Scheme, identified from the baseline characterisation detailed in Section 5.7.

Table 5.15 Summary of Important Ecological Features (IEFs)

IEF	Geographical Importance/ Value	Relevant section of the Scheme	Reason for valuation of IEF
Lesser Black-backed Gull (breeding population)	High	Route wide	Qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary Ramsar site. BoCC Amber list
Herring Gull (breeding population)	High	Route wide	Qualifying feature of the Alde-Ore Estuary SPA and SSSI sites. BoCC Amber list
Black-headed Gull (breeding population)	High	Route wide	Qualifying feature of the Minsmere-Walberswick Ramsar site and Alde-Ore Estuary SSSI. BoCC Amber list
Mediterranean Gull (breeding population)	High	Route wide	Qualifying feature of the Minsmere-Walberswick Ramsar site and Alde-Ore Estuary SPA. Annex I (Birds Directive) BoCC Amber list
Little Tern (breeding population)	High	Kent and Suffolk landfalls	Qualifying feature of the Outer Thames Estuary SPA, Thanet Coast and Sandwich Bay SPA, Thanet Coast and Sandwich Bay Ramsar, Sandwich and Pegwell Bay NNR, Sandwich Bay to Hacklinge Marshes SSSI, Minsmere-Walberswick SPA,

IEF	Geographical Importance/ Value	Relevant section of the Scheme	Reason for valuation of IEF
			Alde-Ore Estuary SPA, Alde-Ore Estuary Ramsar and Alde-Ore Estuary SSSI. Annex I (Birds Directive) BoCC Amber list
Common Tern (breeding population)	High	Route wide	Qualifying feature of the Alde-Ore Estuary SPA and Alde-Ore Estuary SSSI and Outer Thames Estuary SPA. Annex I (Birds Directive) BoCC Amber list
Red-throated diver (non-breeding population)	High	Offshore areas – within the Outer Thames Estuary SPA	Qualifying feature of the Outer Thames Estuary SPA. Annex I (Birds Directive)
Gull species (non-breeding populations)	Low	Offshore areas – route wide	Non-breeding herring gull, common gull, lesser black-backed gull and kittiwake are considered to have a widespread distribution in the North Sea during the wintering period, partly due to their long foraging ranges. Non-breeding little gull and great black-backed gull are considered to be present in smaller numbers. Species included both on BoCC Red and Amber lists
Guillemot (non-breeding population)	Low	Offshore areas – route wide	Non-breeding guillemot are considered to have a widespread distribution

IEF	Geographical Importance/ Value	Relevant section of the Scheme	Reason for valuation of IEF
			in the North Sea during the wintering period. BoCC Amber list
Razorbill (non-breeding population)	Low	Offshore areas – route wide	Non-breeding razorbill are considered to have a widespread distribution in the North Sea during the wintering period. BoCC Amber list
Waterbird Assemblage (non-breeding population)	Medium	Kent landfall - Pegwell Bay	Aggregations of roosting waterbirds over high water and foraging waterbirds on intertidal mudflats over low water. Includes species on Annex I (Birds Directive), Species of Principal Importance (SPI) and both BoCC Red and Amber lists
Cormorant (non-breeding population)	High	Kent landfall - Pegwell Bay	Peak count exceeds 1% GB threshold
Golden Plover (non-breeding population)	High	Kent landfall - Pegwell Bay	Annex I (Birds Directive)
Sanderling (non-breeding population)	High	Kent landfall - Pegwell Bay	Peak count exceeds 1% GB threshold BoCC Amber list

Future Baseline

5.7.48 This section considers the potential changes to the baseline ornithological conditions described above over the period of construction, operation and maintenance, and decommissioning of the Proposed Project and Offshore Scheme. These are changes that might occur in the absence of the Proposed Project being constructed.

5.7.49 During the lifetime of the Proposed Project and Offshore Scheme, the ornithological baseline is expected to evolve both naturally, and in response to global trends including climate change. For example, migrating birds have difficulty adapting to changing conditions due to limitations on phenotypic plasticity, resulting in a mismatch of timing of reproduction and favourable ecological conditions (Rubolini, Saino, & Møller, 2010). A recent study of guillemot, for example, has shown that increased temperatures result in a decrease in the amount of time breeding partners spend together at breeding colonies

(Olin, et al., 2023). This could result in population decline and decreased fitness in birds.

5.7.50 The existing intertidal and subtidal habitats at the landfall areas are likely to continue to be present. However, as a result of hydrological changes and climate-change induced sea level rise, the extent, composition and structure of some habitats may be altered. This could negatively impact the presence and abundance of seabirds and waterbirds by reducing the amount of suitable habitat available to them, and the availability of prey items. For example, prey items such as herring (*Clupea harengus)* and sandeel (*Ammodytes spp.*) could become less prevalent or timings or spawning could change due to changes in water temperature, resulting in the migration of fish species further north to alternative suitable habitat.

5.7.51 Climate change is also likely to affect the migration periods of bird species who arrive either in the summer to breed or in the winter to overwinter on the UK coastline. Higher temperatures could cause species to migrate to the UK earlier in the year and stay for longer periods of time. This could also shorten the amount of time wintering species use habitat in the UK. Some habitats may also be lost due to sea level rise. A reduction in suitable vegetation could also reduce habitat extent.

5.7.52 In addition, the marine environment is experiencing increasing levels of human disturbance. In recent years the North Sea has seen a substantial increase in the development of offshore wind and other subsea infrastructure. In addition, increased anthropogenic use of the coastal and marine environment is increasing the trampling of intertidal habitat, overexploitation of species which provide a food source to seabirds and waterbirds and increasing vessel presence. Declines in little tern due to human disturbance have already been observed in Sandwich and Pegwell Bay NNR (Kent Wildlife Trust, 2023). Effects are anticipated to vary depending on the species of bird and their life history. For example, species which rely on prey items which are an important anthropogenic food source may experience greater decline compared to species which can adapt to different prey. Species which spend longer periods of time at-sea and/or prefer cliff habitats compared to intertidal habitats may experience a lesser decline. However, the full extent of anthropogenic impact will become clearer as pressure from human disturbance increases.

5.7.53 These are factors that will continue to affect the marine environment regardless of whether the Proposed Project is delivered. If the Proposed Project is not delivered, affects from climate change will continue at expected rates.

5.8 Proposed Project Design and Embedded Mitigation

5.8.1 The Proposed Project has been designed, as far as possible, following the mitigation hierarchy in order to, in the first instance, avoid or minimise impacts to birds and effects through the process of design development, and by embedding measures into the design of the Proposed Project.

5.8.2 As set out in **Application Document 6.2.1.5 Part 1 Introduction Chapter 5 EIA Approach and Methodology**, mitigation measures typically fall into one of the three categories: embedded measures; control and management measures; and mitigation measures.

Embedded Measures

5.8.3 Embedded measures have been integral in reducing the adverse effects to birds of the Proposed Project. Measures that that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works; and
- Commitments made within **Application Document 7.5.2 Outline Offshore Construction Environmental Management Plan** and **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**.

Control and Management Measures

5.8.4 The following measures have been included within **Application Document 7.5.2 Outline Offshore Construction Environmental Management Plan** and **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**relevant to the control and management of impacts that could affect ornithology receptors:

- GG04: The Construction Environmental Management Plan (CEMP) shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans. The name and contact details of person(s) accountable for issues relating to dust, waste, water, noise, vibration and soil will be displayed at site boundary.
- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works (ECoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The ECoW will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The ECoW will be supported as necessary by appropriate specialists, including ecologists and arboriculturists.
- GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
- GG22: Construction lighting will be of the lowest levels necessary to safely perform each task. It will be designed, positioned and directed to reduce the intrusion into adjacent properties, protected species and habitats.
- GG25: An Emergency Action Plan will be developed for the construction phase which will outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents.
- NV01: Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP and Outline Noise and Vibration Management Plan (NVMP).
- O01: The CoCP and CEMP will outline the best practice mitigation measures required to be implemented during construction. This would include measures to prevent accidental spillages from occurring and to minimise disturbance of sediments.

- O02: There will be Health, Safety and Environment (HSE) procedures implemented, with strict limits on weather conditions, equipment maintenance and personnel to further reduce the risk of any accidental spills/releases. Furthermore, in the event of a spill, a response will be made swiftly.
- O03: For red-throated diver, a full seasonal restriction (1 November – 31 March) for offshore cable burial activities (including pre-lay grapnel run activities) in the Outer Thames Estuary SPA and a 2 km buffer and a reduced seasonal restriction (1 January – 31 March) will apply to landfall cable installation activities at the Suffolk landfall in Aldeburgh.
- O04: Existing shipping lanes will be utilised for vessel transiting routes to avoid additional disturbance, where practicable.
- O05: Vessel operators will be made aware of the importance and sensitivity of the species to disturbance. Vessels will avoid rafting birds and areas with high densities of birds, where practicable.
- O06: 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.
- O07: Cold Weather Protocol. To miminise additional stress to waterbirds, in the intertidal zone of Pegwell Bay, during periods of severe weather the following restriction will be applied, where practicable. If freezing conditions persist for five consecutive days, work should cease until there has been three consecutive days of thaw.

5.8.5 **Application Document 7.8 Red Throated Diver Protocol** also outlines the measures to be implemented to reduce the Proposed Projects impacts on Red Throated Diver. This is secured by DCO Schedule 3, Requirement 5.

5.9 Assessment of Impacts and Likely Significant Effects

5.9.1 The assessment of the effects of the Offshore Scheme on ornithology receptors described in this section considers the embedded, control and management measures described in Section 5.8.

Table 5.16 Summary of impact pathways and maximum design scenario

Potential Impact	Maximum Design Scenario
Construction	
Disturbance and Displacement of Birds	• Pre-lay preparation activities along the seabed below MLWS, including pre-lay surveys such as use of multi-beam echo sounders (MBES), side scan sonar (SSS), sub-bottom profiling (SBP), visual inspection by Remotely Operated Vehicle (ROV), geotechnical surveys and magnetometer. • Seabed preparation activities along the route below MLWS, including:

Potential Impact	Maximum Design Scenario
	— Route clearance. Boulder/debris clearance not expected along the route. However, if boulders are encountered the normal clearance swathe would be +/- 10 m from planned installation route position list (RPL). — Removal of Out of Service cables — Pre-lay grapnel run – 1-3 m swathe up to 120 km along cable route. and — Any pre-sweeping. Swathe up to 20 m along a length of up to 17.563 km between KP96.32 to KP113.883)[1]. • A limited number of vessels will be operating offshore at any one time for cable lay and trenching, taking place in the context of existing disturbance e.g. commercial and recreational shipping and wind farm servicing. The exact number of vessels required is not currently known and will be confirmed once the contractor has been appointed. A list of vessel types is presented in **Application Document 6.2.1.4**). • A Jack-Up Barge (JUB) and/or flat-top pontoon barge will be operating in nearshore waters at each landfall. • For the marine cable, construction would be a 24-hour operation where viable to minimise overall installation time, maximise the use of suitable weather windows and take advantage of vessel and equipment availability. All other construction working hours will be as follows: — Monday – Friday 7am to 7pm. — Saturdays, Sundays and Bank Holiday – 7am to 5 pm. • Horizontal Directional Drilling (HDD) expected to last 120 days with 24/7 drilling at each landfall (periods of downtime expected to occur for movement between different exit points). HDD is expected to result in the largest production of airborne noise; and • Duration of cable pull in expected to last 12 hours for four days at each landfall, including one day for preparation (pull-in assumed to be one tidal cycle during daylight hours).

[1] There is no designated disposal area, the sand will be deposited within the Offshore Scheme Boundary within the area of pre-sweeping in such a way that the local currents will not backfill the pre-sweep area prior to cable installation and protection. The mechanism to infill the rock trench and allow the seabed to revert to natural bedforms is by natural backfill and sediment circulation / deposition.

Potential Impact	Maximum Design Scenario
Loss and disturbance to habitats used by birds Changes to prey availability	**Suffolk landfall** Total area of 0.0002 km^2 of disturbance from the following: • use of jack-up barge (JUB) at 4 HDD entry/exit point locations (50 m^2 at each HDD entry/exit point location). **Kent Landfall** Total area of 0.0721 km^2 of disturbance from the following: • cofferdams and HDD exit pits will be located within a designated working area of 0.0216 km^2 (120 x 180 m) in the upper intertidal. Construction of the cofferdams is estimated to take 28 days (7 days per cofferdam). Each of the cofferdams will be in place for 30-60 days, with a total duration of 120 days. • This includes 0.00036 km^2 from the temporary placement of concrete mattresses/rock bags at HDD entry/exit points. Assumed to be five per HDD exit (worst-case scenario measuring 0.45 m x 3.0 m x 6.0 m). These will be removed approximately 1 week before cable pull-in, before permanent protection will be buried at the same location, leading to the same area of temporary disturbance; • 0.0002 km^2 of disturbance from use of JUB or back-hoe dredger at 4 HDD entry/exit point locations (50 m^2 at each HDD entry/exit point location); • 0.0003 km^2 of disturbance from the use of a cable lay barge and associated anchoring (8 x anchors each with 32 m^2 footprint each and berthed barge). The cable barge will be in place for a period of up to 32 days; and • Superficial disturbance of the mudflats within the LoD from the movement of plant and vehicles during construction programme, including to and from the hoverport. The MDS is up to 20 construction plant/vehicles at any one time (based on cable pull in) and 40 movements per day, at peak times. All vehicles removed from the intertidal daily. There will be placement of temporary ground protection mats between the hoverport and the HDD work area; Trenching for cable installation in Pegwell Bay, assuming unbundling of the two cables at MLWS and buried in separate trenches (2 x 20 m) for a distance of 1,250 m to HDD, gives estimated area of disturbance of 0.05 km^2 for two cables eee •

Potential Impact	Maximum Design Scenario
	Offshore Scheme installation A number of pre-installation and cable installation activities will temporarily disturb seabed habitats. These activities include: • 0.36 km^2 of disturbance from the pre-lay grapnel run (maximum swathe of 3 m up to a length of 120 km); • 0.35 km^2 of disturbance from sand wave lowering (pre-sweeping) (maximum swathe 20 m over a length of 17.56 km between KP96.32 to KP113.883)[2]; • 3.01 km^2 of disturbance from cable trenching. This may include various methods including ploughing[3], jet trenching, and/or mechanical trenching (maximum swathe of 25 m over a length of up to 122 km).
Alteration of water quality due to increased Suspended Sediment Concentrations (SSC) and disturbance of contaminated sediment	• Based on modelling undertaken in **Application Document 6.2.4.1 Part 4 Marine Chapter 1 Physical Processes**, the highest dispersion is associated with the use of jetting during cable installation.
Operation & Maintenance	
Disturbance and Displacement of Birds	Total area of 0.18 km^2 of permanent loss of habitat from the following options for external cable protection: • In areas identified as high-risk for cable strike - 38 km of the Offshore Scheme from KP35 to KP58, and KP81.5 to KP96.5 – there will be 0.0456 km^2 of habitat loss from rock backfill. • In areas of low-risk for cable strike, excluding areas of trenchless techniques at landfall, the placement of remedial rock berms is estimated to be required for 15% of the Offshore Scheme, which is 12,000 m. Rock berms will be up to 7 m wide (no lowering) at the base giving a total area of loss of 0.084 km^2. • 0.00036 km^2 loss from the burial of concrete mattresses at Suffolk Landfall. • 0.05 km^2 of loss from concrete mattresses/rock berm protection at cable crossings. There are ten in-service cable crossings that will require protection (maximum footprint of 0.005 km^2 per crossing).
Direct Loss and Disturbance of Seabed Habitat (including associated prey) used by foraging seabirds and waterbirds	
Alteration of water quality due to increased Suspended Sediment Concentrations (SSC) and disturbance of contaminated sediment	

[2] There is no designated disposal area, the sand will be deposited within the Offshore Scheme Boundary within the area of pre-sweeping. Where sand wave clearance is required dredged material will be redistributed along the cleared section of cable route within the Offshore Scheme Boundary such that the seabed will revert to natural bedforms is by natural backfill and sediment circulation / deposition.

[3] Displacement plough and jet plough are considered unlikely methods to be used. However, the swathe of displacement plough (up to 25 m) has been used in the assessment as a worst-case scenario

Potential Impact	Maximum Design Scenario
	• The Offshore Scheme is designed for a lifespan of approximately 40-60 years. • The cable system installation is designed such that a regular maintenance regime is not required to maintain the integrity of the link.
Decommissioning	
Impacts the same as or less than construction and operation and maintenance	• Offshore and landfall working hours will be continuous (24/7). • An initial decommissioning plan will be written once the final route and installation methodology is engineered by the contractor. This will be in accordance with all applicable legislation and best practice guidance at the time of compilation. • Dependent on requirements at end of asset life, the redundant cables could either be recovered for recycling (in its entirety, or in parts), or left in-situ.

Construction Phase

Disturbance and displacement of birds

5.9.2 During construction of the Proposed Project, there is the potential for the disturbance and displacement of birds at both the landfall locations and in offshore waters due to the presence of a small number of vessels and barges potentially generating sound and visual impacts.

5.9.3 Within the marine environment, the evidence base around disturbance and displacement, and subsequent guidance, has been established in relation to assessing the vulnerability of seabird populations to offshore wind farms. Thus, when defining the sensitivity of a species to the construction and presence of other operational marine infrastructure it is important to consider the variation in disturbance profile. The disturbance profile of construction activities for the Offshore Scheme are significantly different from that of an OWF. In addition, with OWFs the potential for construction activities associated with export cable laying, namely the physical presence of the cable laying vessels, to lead to disturbance and displacement of more sensitive species surrounding the cable laying vessels is only considered where the export cable corridor runs through offshore areas that support higher densities of the more sensitive seabird species, typically within or surrounding SPAs, so this impact pathway is not regularly included within OWF EIAs.

5.9.4 For red-throated diver, guidance from the Joint SNCB (JNCC, 2022) advises that for OWFs a precautionary buffer of 10 km should be applied when considering the potential for displacement effects from the operational OWF. This is a larger area than previous advice, which applied a 4 km buffer for divers and seabirds. The guidance does recognise that the rate of change in displacement appears to vary, depending on the region and on the survey methodology. In light of this advice and with consideration of the absence of permanent infrastructure on the sea surface, as well as the profile of

construction activities and associated vessel movements set out above, that for the offshore scheme installation, displacement from any construction activities is highly unlikely to occur beyond 2 km and as presented in statutory consultation documents, represents an appropriate worse case.

5.9.5 The disturbance profile for the Proposed Project construction phase, includes several vessels present within the marine environment, as described in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**. The exact number of vessels to be used is not currently known and will be confirmed once the contractor has been appointed. However, the number of vessels present at any one time is expected to be limited and will include cable lay vessels (CLV), trenching vessels rock placement vessels, guard vessels and support vessels. The vessels would be slow moving with a maximum operational speed of 7 km per day, and maximum transit speeds of 12 knots. Any potential disturbance would take place in the context of existing sources of disturbance such as commercial shipping, recreational boating, and wind farm service vessels (see **Application Document 6.2.4.7 Part 4 Marine Chapter 7 Shipping and Navigation** for further details). If cable lay and post lay installation burial is ongoing at the same time, the maximum number of vessels operating at any one time offshore is still expected to be similar to existing background levels.

5.9.6 Additionally, a JUB and/or flat-top pontoon barges will be operating in the nearshore at both Kent and Suffolk landfalls. During construction the JUB will be largely stationary but will be moving between a minimum of four locations for the HDD exit points.

5.9.7 The vessels and construction activities are expected to generate noise which will be perceptible by birds both offshore and at the landfalls/intertidal zones. Further details are presented in **Application Document 6.2.2.2 Part 2 Suffolk Chapter 2 Ecology & Biodiversity** and **Application Document 6.2.3.2 Part 3 Kent Chapter 2 Ecology & Biodiversity.**

5.9.8 Sensitivity to disturbance in seabirds from vessel use is dependent on several factors, including duration, type and intensity of disturbance, the phase of the life cycle when the disturbance occurs, the degree of habituation, and the presence of opportunistic predators (Showler, Stewart, Sutherland, & Pullin, 2010). Resilience to disturbance and displacement varies between species (MMO, 2018).

Red-throated diver

5.9.9 As set out in Section 5.8, a commitment has been made that construction works within the Outer Thames Estuary SPA and 2 km buffer around the SPA will be undertaken outside of the seasonally restricted period. This includes a full seasonal restriction (1 November -31 March) for offshore cable installation activities within the Outer Thames Estuary SPA and a 2 km buffer around the SPA and a reduced seasonal restriction (1 January - 31 March) for landfall cable installation activities. This measure was agreed at the request of Natural England in order to avoid any potential for effects (either alone or in combination with any other developments) on red throated diver of the Offshore Scheme with other offshore developments and is therefore effectively embedded in the Proposed Project.

5.9.10 Non-breeding red-throated diver are considered to be of high sensitivity to anthropogenic sources of disturbance, including shipping traffic and offshore windfarms.

5.9.11 Red-throated diver tend to form groups on the sea, which means that if a vessel passes through or close to a group, it has the potential to disturb and displace many individuals at once. The effect of the vessel's presence would be disturbance of the birds whilst

they are in foraging or resting habitats on the sea; disturbed birds would have to move elsewhere, which may result in birds having less time to forage and cause them to expend additional energy. However, effects on energy budgets are extremely unlikely to result in population dynamic effects (i.e., increased adult mortality or effects on reproduction) because the effect is temporary and short in duration. It is only likely to affect a small proportion of individuals and there is an abundance of alternative habitat in the wider area. Birds are therefore likely to find alternative feeding/loafing grounds in the short term and effects would be localised.

5.9.12 There are high levels of shipping activity and recreational use in the Outer Thames Estuary and southern North Sea, with this part of the North Sea being busy with fishing vessels, cargo vessels and increasingly, vessels associated with the offshore renewables industry. Red-throated diver are present despite this background of existing vessel presence and shipping activity, although their distribution is heavily influenced by these activities. The cable installation vessels generate similar levels of noise to other large marine vessels and the context of the existing environment has been taken into consideration. As shown on (**Figure 6.4.4.5.5 Red-throated diver counts (individuals) and densities (number km^2) in the Outer Thames Estuary SPA** in **Application Document 6.4.4.5 ES Figures Marine Ornithology)**), the Offshore Scheme does not pass through areas recorded as having the highest concentrations of red-throated diver within the Outer Thames Estuary SPA.

5.9.13 In addition, vessels will travel at slow speeds with a maximum operational speed of 7 km per day, and a maximum transitional speed of 12 knots. However, due to the 24/7 nature of the works, vessels will be operating during hours of darkness, and lighting will be required in order to ensure operations on the vessels can be conducted safety. Artificial lighting can attract and disorientate seabirds, as well as repel them and cause them to avoid the area (Adams, Fernandez-Juricic, Bayne, & St Clair, 2021). Any artificial lighting will be directed and only used in the vicinity of the work area, to minimise the likelihood of seabirds being attracted to vessels during the night.

5.9.14 As red-throated diver are considered to be sensitive to vessel traffic and movements, the mitigation measures listed in section 5.8.4 and **Application Document 7.8 Red-throated Diver Protocol**, will avoid any potential construction impacts. As such, the magnitude of this impact is considered to be low, with no long-term effect on individuals or the population. The assessment concludes that the displacement of red-throated diver during construction of the offshore scheme alone, which are of high sensitivity, has been assessed as having a magnitude of negligible which will only result in a **negligible** effect that is not significant.

Breeding and non-breeding seabirds

5.9.15 Several other seabird species (excluding red-throated diver) are expected to be present both in offshore waters and in intertidal habitat at both landfall locations during construction of the works. During the breeding season, this includes foraging lesser black-backed gull, herring gull, black-headed gull, mediterranean gull, little tern and common tern. If the construction period occurs during the non-breeding season, these species are expected to include red-throated diver, gull species (including common gull, lesser black-backed gull, kittiwake, great black-backed gull and little gull), guillemot and razorbill. Such species are considered less sensitive to anthropogenic disturbance compared to red-throated diver. However, some displacement may still occur.

5.9.16 Sensitivities of seabirds to disturbance from vessels have been assigned using data produced by the MMO (2018), Fliessbach et al. (2019) and Garthe and Hüppop (2004)

which show the level of displacement cause by vessels. Taking into consideration the expected abundance of species in the Study Area, and their foraging ranges (Woodward, Thaxter, Owen, & Cook, 2019), sensitivities to disturbance are shown in Table 5.17.

Table 5.17 Sensitivities of seabirds to disturbance from vessels

Species	Sensitivity
Lesser black-backed gull	Low
Little tern	Medium
Herring gull	Low
Black-headed gull	Low
Mediterranean gull	Low
Common tern	Low
Common gull	Low
Kittiwake	Low
Little gull	Low
Great black-backed gull	Low
Guillemot	Medium
Razorbill	Medium

5.9.17 Fliessbach et al. (2019) observed that only 17% of lesser black-backed gull (total number observed (n) =1,347) were observed flying off in response to an oncoming vessel. Common tern were also concluded as having low vulnerability to vessel presence. Little tern was not included in the assessment. Sensitivity of Mediterranean gull was not assessed by the MMO (2018) and Fliessbach et al. (2019). The use of offshore habitat by Mediterranean gull suggests a greater potential to interact with vessels; however, their sensitivity is likely to be similar to other gull species i.e., low.

5.9.18 Vessel presence has the potential to disturb multiple individuals at any one time. Seabirds, in particular auks, are known to raft together at sea in groups. Thus, when a vessel passes through or within close proximity to a raft, many individuals could be disturbed at once. This could interrupt foraging and/or nesting and loafing activities for all species, resulting in the displacement of birds to quieter areas, reduced foraging time and increased energy expenditure.

5.9.19 However, effects on energy expenditure are unlikely to have population-wide effects on seabirds, for example effects on reproduction, due to the small numbers of individuals likely to be affected in a localised area. In addition, any birds that are present during the disturbance are likely to find alternative foraging and loafing grounds in the wider North Sea area, due to the large area of suitable habitat (effects on prey availability are discussed in a separate impact pathway below).

5.9.20 However, vessels will be travelling at low speeds and will be constantly moving their presence in any one location in offshore waters and therefore presence in offshore

foraging and loafing areas will be short-term and temporary, with seabirds returning once the vessel has moved on. In addition, the Offshore Scheme and wider North Sea are typically characterised by both commercial and recreational heavy shipping traffic occurring both day and night, with major shipping channels also crossing the Offshore Scheme. The small number of vessels required for the Proposed Project is considered minor compared to the total baseline number of vessels within the Offshore Scheme and wider North Sea at any one time. Therefore, any seabirds present in the vicinity of the Proposed Project vessels are expected to have some habituation to the disturbance created by vessel presence and associated effects including disturbance from noise and artificial lighting.

5.9.21 As a result, given the temporary, short-term nature of the construction works, in an area that is already busy with shipping traffic, it is not anticipated that the addition of a small number of vessels required for the Proposed Project will considerably increase disturbance and displacement of seabirds from baseline vessel traffic conditions. In addition, with the implementation of mitigation measures outlined in Section 5.8, the impact of disturbance and displacement on other species of seabird (excluding red-throated diver) during the breeding and non-breeding seasons, which are of low to medium sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is considered to be not significant.

Non-breeding waterbirds using the intertidal area

5.9.22 Due to the presence of vessels and machinery operating in shallow waters and the intertidal area at the landfalls, including the use of a JUB and floating excavators, there is the potential for disturbance to, and displacement of, waterbirds due to the noise and visual disturbance generated by the activities. At both the Suffolk and Kent landfalls the marine HVDC cables transition to the underground HVDC cables at a transition joint bay (TJB), in land from the coast. At both landfall locations, the cables will be installed using trenchless methods such as HDD to avoid environmental constraints. At the Kent landfall, this will require an HDD exit point within the intertidal zone at Pegwell Bay. As described in the introduction to this chapter, the exit points of the trenchless crossing at the Kent landfall will be located within the intertidal mudflat habitat at Pegwell Bay and buried beneath the seabed at depths of between 15 m and 20 m. This approach will avoid the saltmarsh habitat at Pegwell Bay.

5.9.23 Further clarification on the cable installation activities to be undertaken at the Kent landfall within the intertidal area in Pegwell Bay are provided in **Application Document 9.13 (B) Pegwell Bay Construction Method Technical Note** submitted at Deadline 2. The HDD exit point at Kent would be located approximately 105 m to 140 m seaward from the edge of the saltmarsh. Due to the position of the trenchless crossing exit pits in the intertidal zone, there is likely to be a requirement to install a temporary cofferdam (or up to four smaller cofferdams – one per duct) to prevent premature backfilling of the exit pits for the trenchless crossing during receipt of the drill end and during reaming, duct installation and duct end works. Only one cofferdam will be installed at any one time. It is anticipated it will take up to seven days to install a cofferdam around a single HDD exit pit. Based on this, the total duration of cofferdam installation (including potential vibropiling, if deemed necessary) would be 28 days (likely to construct the cofferdams with breaks of seven to 21 days between each cofferdam construction).

5.9.24 HDD installation will be a 24 hour per day operation, where viable, to minimise overall installation time, maximise the use of suitable weather windows and take advantage of

vessel and construction plant and equipment availability. The trenchless crossing (HDD) works will be as follows:

- Pilot drilling
- Reaming
- Duct installation
- Duct End Works

5.9.25 The equipment and construction plant and vehicles to be used are set out in Table 1.5 of **Application Document 9.13 (B) Pegwell Bay Construction Method Technical Note** submitted at Deadline 2 and would include up to four small excavators (15-20t), 2 tractors with trailers, 4WD vehicles, telehandlers, Argocats, hovercraft and ancillary equipment such as drilling pipes, pumps and generators. Excavators would remain within a maximum area of 120 m x 180 m around the exit pits. As the exits are in the upper intertidal area, access will be via the corridor from the former hoverport rather than transportation by sea at the top of the tide. The noisiest equipment is expected to be the excavators and vibratory piling, if deemed necessary. Pumps and generators would be in super-silenced units, if full high pressure mud pumps are required, they typically generate noise of 77dB at 2.5 m distance and generators 71dB at 1.0 m distance. A 20t excavator typically generates 99dB(A).

5.9.26 For the cable pull-in and cable burial a cable lay barge would be required to bring the HVDC cable to the location of the exit pit. In addition to this, a similar range of plant and vehicles used in the HDD installation may be required to assist with the cable pull-in due to the extent of the intertidal area. Cable pull-in would take 16 days (including recovery of the HDD duct ends and checking the cable ducts, placement of rollers / CLB anchors, cable pull in), with cable burial taking up to seven days, based on 24 hour working

5.9.27 To inform an assessment of potential noise impacts on waterbirds using the intertidal area and adjacent saltmarsh and shingle beach for feeding and roosting, in previous meetings with Natural England regarding the project, it was discussed that:

- birds generally give no reaction to noise levels of 55dB or below (Cutts & Allan, 1999)]; and
- a change above 3dB is required for the difference to be perceptible and therefore a 3dB change should be used for the purposes of screening potential impacts.

5.9.28 However, it was also agreed that there is a difference between being perceptible as a change and being disturbing. Therefore, while a 3dB change is a suitable threshold for identifying the potential for an impact, a greater change would likely be needed to actually cause disturbance.

5.9.29 If the threshold for no reaction is 55dB, and any noise would need to be at least 58dB to be perceptibly louder (i.e. 3dB greater than 55dB), then it was agreed with Natural England that a reasonable precautionary threshold for significant disturbance would be 60dB (i.e. 5dB above 55dB).

5.9.30 Noise modelling has been carried out to determine the effect of construction plant noise on ornithological receptors in Pegwell Bay. L_{Amax} and L_{Aeq} indices are used to characterise and quantify different aspects of a given noise event, over the time period

of interest. A L_{Amax} (maximum A-weighted Sound Pressure Level)[4] corresponds with the loudest single noise level one would hear during the noise event or time period of interest, such as the loudest bang, or passing vehicle-engine noise. On the other hand, a L_{Aeq} (A-weighted equivalent continuous sound pressure level) is akin to the “average” noise level over the noise event or time period of interest. It accounts for all of the noise (i.e. the fluctuating highs and lows, including the L_{Amax} noise event) during that time, and represents, in a single number, the "average" level of noise.

5.9.31 Calculations have been provided to present a representative and realistic worst-case scenario of construction activity in the form of noise contours to show the highest noise levels typically produced by the loudest plant equipment at different distances from the source. The worst-case construction activity is identified to be vibratory piling (91 L_{AFmax} (dB)) associated with coffer dam establishment. Due to the intermittent nature of piling as a noise source, the L_{Amax} levels are used in the predictions. The noisiest plant is considered to be the tracked excavator (79 L_{pA} at 10 m (dB) (passby level from BS 5228-1) which will move between the HDD exit pit and former hoverport construction access route.

5.9.32 Noise contours for construction activities in Pegwell Bay are shown in **Figures 6.4.4.5.7 and 6.4.4.5.8**[5] in **Application Document 6.4.4.5 (B) ES Figures Marine Ornithology,** submitted at Deadline 2. These should be viewed alongside **Application Document 9.13 (B) Pegwell Bay Construction Method Technical Note** submitted at Deadline 2. The noise contours consider all activities undertaken at each phase of construction works, modelling the noisiest generating plant or equipment associated with each element of these phases, e.g., plant moving along the construction access route alongside equipment operating in the HDD exit point working area, therefore ensuring a cumulative worst-case is presented. These are considered to represent a worst-case scenario. For example, the levels generated by the vibratory piling rig will only occur at most, for 28 days. All other activities will generate lower noise levels.

5.9.33 Whilst the surveys identified waterbirds using the entirety of the intertidal area for foraging at low water, areas of particular focus, e.g., around the mouth of the River Stour are over 350 m from the areas where worse-case significant disturbance from construction noise sources may occur. In addition, sensitive high tide waterbird roost locations were at least 500 m from the proposed exit pits works areas.

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[4] L_{Amax} referred to here uses the fast time-weighting, as required by BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise.

[5] The noise contour maps present the outcome from 3D computer modelling that was constructed using Datakustik CadnaA (version 2025) (Datakustik, 2025), which incorporates the prediction methodology for the propagation of sound set out in ISO 9613-2:2024 2024).

The modelling includes 3D ground height data from the National LiDAR Scheme (Department for Environment, 2022), with all ground assumed to be ‘soft’ (i.e. subject to attenuation from the ground effect), except for areas of water (including intertidal areas at low water) which are assumed to be ‘hard’ (i.e. reflective). The modelling has also considered the low number of acoustically reflective surfaces such as buildings in the area of focus. Source heights of 1.5 metres, and receiver heights of 0.5 metres have been used.

The ‘Lmax’ calculation function of the noise modelling software has been used to calculate noise levels based on a 10 m x 10 m receiver grid, which has been used to derive noise contours in 5 dB intervals. This calculation function uses a grid of point sources spread within the borders of the area source (i.e. the access corridor or work area) and the maximum value evaluated.

5.9.34 Waterbirds, including the qualifying species in the Thanet Coast and Sandwich Bay SPA have varying degrees of sensitivity to visual disturbance from human activities. Various parameters are used to measure disturbance responses, with Flight Initiation Distance (FID) being the most important one. This is defined as the distance at which a bird or group of birds starts to escape (such as by walking, swimming or flying away) when approached by a disturbance agent. The FID is meaningful because it reflects the trade-off between costs of escape (energetic cost of flight and the temporary loss of calorific intake) and the inferred risk of being predated upon. A review of disturbance distances for selected bird species and recommended buffer zones for visual disturbance is provided by NatureScot. This includes the following recommendations for waterbirds species relevant to the Kent landfall:

- Golden Plover / Sanderling– medium sensitivity 200-500 m
- Cormorant –based on other large waterbird species, e.g., geese (medium sensitivity 200-600 m)
- Other wader species – High sensitivity (Curlew 200-650 m) Medium sensitivity (Oystercatcher 150-300 m, Grey Plover 150-300 m, Dunlin 150-300 m, Knot 100-300 m, Redshank 200-300 m, Bar-tailed Godwit 200-300 m
- Other duck species – High sensitivity (Wigeon 200-500 m)

5.9.35 Different noise and visual disturbance elements are likely to operate on bird receptors simultaneously, whereby it is likely that visual disturbance overrides aural stimuli. While construction noise is likely to have fallen to non-disturbing levels by 350 m from source (on worse-case predictions), visual stimuli will likely exert impacts up to 500 m from source.

5.9.36 The indicative programme suggests that the marine HDD works at the Kent landfall would be undertaken in Quarter 2 and 3 of 2027. Based on the results of the bird surveys undertaken at the Kent landfall and summarized in section 5.7.45, Table 5.13 and Table 5.14, and supported by WeBS data, numbers of waterbirds using the intertidal areas within Pegwell Bay decrease from March onwards, with peak occurrences, particularly of Golden Plover, Cormorant and Sanderling, being recorded during surveys in the mid-winter months of December, January and February, respectively. As such, important concentrations of waterbirds are unlikely to be present when works are being undertaken in the intertidal zone.

The combination of distance of works from key roosts locations, restricted duration and extent of works within the intertidal zone, limited intertidal zone at risk of significant noise and visual disturbance in the context of the wider Pegwell Bay intertidal resource and predicted seasonal timing for these works reduces the overall effect on key waterbird species and assemblages. As a result, given the temporary, short-term nature of the construction works at the landfalls, it is not anticipated that the addition of a small number of vessels and machinery in the intertidal area will considerably increase disturbance and displacement of waterbirds. In addition, with the implementation of mitigation measures outlined in Section 5.8, the impact of disturbance and displacement on waterbirds, which are of high/medium sensitivity, has been assessed as having a magnitude of small which results in a **minor adverse** effect, which is considered to be not significant.

Loss and disturbance of habitat used by birds

5.9.37 Several activities conducted during construction of the Proposed Project are expected to cause potential direct loss and disturbance of intertidal habitat at the landfall locations which includes habitats used by foraging waterbirds, and habitat in offshore waters (seabed sediment mainly coarse and sandy; see **Application Document 6.2.4.2 Part 4 Marine Chapter 2 Benthic Ecology**) used by foraging seabirds. These activities are:

- Geotechnical samples using coring;
- Cable route clearance, including removal of out of service cables and boulder clearance using ploughs or ROVs and grabs;
- Pre-lay grapnel run (PLGR);
- Pre-sweeping of sand waves;
- Potential UXO clearance;
- Cable lay;
- Jet trenching, cable burial ploughing, mechanical trenching or mass flow excavators (MFE);
- Installation of trenchless solution conduits; and
- Rock placement.

Red-throated diver

5.9.38 A large proportion of the habitat loss and disturbance, i.e., to seabed sediments, during construction will occur within offshore waters. This includes where the Offshore Scheme intersects the Outer Thames Estuary SPA and therefore, areas supporting red-throated diver.

5.9.39 The total amount of seabird habitat subject to disturbance during construction is outlined in Table 5.16, with 54.7 km of the Offshore Scheme, and therefore the associated disturbance, expected to occur within the Outer Thames Estuary SPA. As shown in **Figure 6.4.4.5.5 Red throated diver counts (individuals) and densities (number km^2) in the Outer Thames Estuary SPA** in **Application Document 6.4.4.5 ES Figures Marine Ornithology**), the cable route is expected to intersect the Outer Thames Estuary SPA in areas where red-throated diver densities are considered to be much lower compared to other areas of the SPA, for example on the approach to the Thames Estuary, indicating that the cable route is potentially less favourable for the species.

5.9.40 Disturbance and loss of seabed habitat within the Outer Thames Estuary SPA is considered small, compared to the total area of the SPA. Displacement of red-throated diver has been considered in section 5.9.10 and implications of habitat disturbance and loss in the context of prey availability is considered in section 5.9.49. The physical loss of and disturbance to seabed sediments is expected to be short-term and temporary, with no net loss in availability of habitat resource. Therefore, the impact is of negligible magnitude, which results in a **minor adverse** effect, which is considered to be not significant.

Breeding and non-breeding seabirds

5.9.41 Loss of habitat and seabed disturbance is also expected to occur within areas used by foraging gull, tern and auk species during the breeding and non-breeding seasons, including the loss of fish spawning and nursery grounds. Changes in prey availability are considered in section 5.9.49.

5.9.42 The seabird species likely to be present in offshore waters during construction have long foraging ranges (Woodward, Thaxter, Owen, & Cook, 2019) which extend beyond the boundary of the Offshore Scheme. Therefore, it is expected that the overall foraging resource won't be significantly depleted and that extensive areas of alternative foraging habitat will be available. The cable will be buried during construction, and habitat will be replaced following cable removal. allowing habitat and prey species to return following the disturbance.

5.9.43 The total area of habitat disturbance in offshore waters due to construction of the Offshore Scheme is outlined in Table 5.16. Compared to the overall availability of foraging habitat in the North Sea, and in particular the wide areas considered to be suitable for herring and sandeel, the total habitat loss is considered small. The area of disturbance will also be moving along the Offshore Scheme as construction progresses along the route. Therefore, only small areas of habitat supporting small numbers of birds are likely to be affected over a very short period at any one time. Therefore, the magnitude of habitat disturbance is considered to be low.

5.9.44 Considering the mitigation to be applied, the impact of direct loss and disturbance of seabed habitat on seabirds during the breeding and non-breeding seasons, which are of low sensitivity, has been assessed as being of negligible magnitude which results in a **negligible** effect, which is considered to be not significant.

Non-breeding waterbirds

5.9.45 At both landfall locations, HDD is proposed, with drilling below the ground surface undertaken to reduce the loss of habitat. As a result, the main areas of temporary disturbance of habitat at the landfalls are around the exit points for trenchless solution conduits (four at each landfall). The Suffolk landfall would be installed by HDD from the transition joint bay illustrated in **DCO/S/DE/SS/1211** of the Design and Layout Drawings (**Application Document 2.13.1 Design Drawings-Suffolk)** to approximately 7 m LAT. The Kent landfall would be installed by a HDD from the TJB illustrated on **DCO/K/DE/SS/1257** of the Design and Layout Drawings (**Application Document 2.13.2 Design Drawings-Kent)** to extend as far as practicable, in order to minimise the impact on the intertidal saltmarsh that extends from the shoreline up to 250 m from the shore.

5.9.46 Due to the extent of the intertidal habitat at the Kent landfall, the HDD ducts and placement of rock mattresses will occur in the upper intertidal zone, approximately 105 m to 140 m from the seaward edge of the saltmarsh (**Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project)**. There is also the potential for a small cofferdam to be installed around the HDD exit point area to contain drilling fluids, which is also expected to disturb habitat. Vibropiles may also be used if deemed necessary. Access tracks will also be placed across the intertidal area to allow the movement of machinery to and from the shoreline. However, due to the extent of the intertidal habitat in Pegwell Bay at low tide, the construction activities are considered to only result in a small loss of waterbird foraging habitat, for a limited period of time, compared to the overall sandy and muddy habitat present in Pegwell Bay.

5.9.47 Any habitat that is lost or disturbed is expected to be rapidly replaced to baseline conditions following demobilisation, due to the tidal nature of the area and the subsequent sediment transport that is likely to occur.

5.9.48 The impact of direct loss and disturbance of intertidal habitat on waterbirds, which are of low sensitivity, has been assessed as being of negligible magnitude which results in a **negligible** effect, which is considered to be not significant.

Changes in prey availability

5.9.49 The availability of prey items, particularly fish and shellfish, for all seabirds present in habitat along the Offshore Scheme and surrounding areas in the North Sea is essential to support breeding colonies. Disturbance of the seabed during construction of the Proposed Project, for example during cable trenching and the use of a JUB at HDD exit points, has the potential to affect prey availability. This could result in increased energy expenditure due to birds travelling further afield to find alternative suitable prey sources.

Red-throated diver

5.9.50 The continuation of prey availability within the Outer Thames Estuary SPA is considered essential to support the non-breeding population of red-throated diver through the construction phase of the Proposed Project. Red-throated diver are considered to feed on small fish and invertebrates. However, as assessed in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology,** herring and sandeel are considered to be the most sensitive fish species to disturbance and habitat loss due to their association with seabed during the important spawning life stage. Therefore, the assessment on herring and sandeel is considered to represent a worst-case scenario when considering changes in prey availability.

5.9.51 As shown in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** and **Application Document 6.3.4.3.A Herring and Sandeel Assessment**, only small portions of the Outer Thames Estuary SPA overlap with preferred or marginal herring habitat, with a large proportion of the SPA falling within unsuitable herring habitat.

5.9.52 The majority of the Outer Thames Estuary SPA does overlap with preferred and marginal sandeel habitat (**Application Document 6.3.4.3.A Herring and Sandeel Assessment**). However, only a small proportion of this is also located within the Offshore Scheme and therefore the potential for disturbance within the Outer Thames Estuary SPA during the construction phase of the Proposed Project is expected to be limited.

5.9.53 **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** has concluded that any temporary disturbance to herring and sandeel habitat is expected to be highly localised and minor. Therefore, only a very small proportion of available prey items in the Outer Thames Estuary SPA are expected to be affected, due to the small areas of suitable habitat that overlap with both the Outer Thames Estuary SPA and the Offshore Scheme. As a result, effects on other less sensitive fish and shellfish species, which may also be consumed by red-throated diver are also considered to be highly localised and limited.

5.9.54 As a result, the impact of changes in prey availability on red-throated diver which are of high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is considered to be not significant.

Breeding and non-breeding seabirds

5.9.55 Herring and sandeel are also considered particularly important prey items for other species of seabird. As shown in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** important grounds for both herring and sandeel are present along the Offshore Scheme and therefore have the potential to be disturbed. Herring and sandeel are considered particularly sensitive to habitat disturbance due their specific sediment requirements and demersal lifestyle.

5.9.56 However, the herring and sandeel spawning and nursery grounds in the North Sea are widespread and cover a large proportion of the North Sea (see **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology**). Therefore, the number of available prey to be impacted compared to the wider availability in the North Sea is considered to be small. Furthermore, effects to herring and sandeel habitat are expected to be highly localised, and due to the dynamic nature of the sandy sediment present in herring and sandeel habitats, the seabed is expected to recover to normal conditions following the disturbance.

5.9.57 Smothering of prey items including herring, sandeel and shellfish species could also occur, resulting in a reduction of important food sources, in addition to decreasing visibility for foraging seabirds. As herring and sandeel are demersal spawners, they are considered to be moderately sensitive to smothering effects. However, herring are considered to be highly adaptable during disturbance and their spawning grounds are often located in dynamic nearshore areas where disturbance and increased SSC regularly occurs. In addition, sandeel are burrowing species and often spend the majority of the year under the sediment surface (Van der Kooij, Scott, & Mackinson, 2008). Shellfish species spend a large proportion of time on the seabed, however they are considered to have a lower sensitivity to, and higher tolerance of, increased SSC (Neal & Wilson, 2008). Therefore, effects on important prey species and foraging grounds are considered to be limited.

5.9.58 **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** has concluded that effects to fish and shellfish habitat are expected to be negligible and highly localised. Therefore, changes in prey availability for seabirds are also expected to be limited and highly localised.

5.9.59 As a result, the impact of changes in prey availability on seabirds during the breeding and non-breeding seasons, which are of low to medium sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is considered to be not significant.

Non-breeding waterbirds

5.9.60 The majority of works at the Suffolk landfall are to occur within deeper waters of the subtidal zone, away from the usual habitat of intertidal waterbirds. Therefore, this hasn't been considered further.

5.9.61 However, due to the location of Kent landfall works within the intertidal zone, there is the possibility of changes in prey availability to affect waterbirds in Pegwell Bay.

5.9.62 Waterbirds present at Pegwell Bay forage on the intertidal mudflats and saltmarshes for small crustaceans and worms (The Wildlife Trusts, 2024). Small benthic organisms are likely to be temporarily disturbed during intertidal works. However, physical disturbance to benthic organisms has been assessed as minor and not significant in **Application Document 6.2.4.2 Part 4 Marine Chapter 3 Benthic Ecology**. In addition, the intertidal

works are only expected to occur over a very small area compared to the total area of mudflats available for foraging in Pegwell Bay. Therefore, indirect impacts on prey availability to waterbirds are expected to be temporary and very minor, with no permanent reduction in the prey resource.

5.9.63 As a result, the impact of changes in prey availability on waterbirds, which are of low to medium sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is considered to be not significant.

Alteration of water quality due to increased suspended sediment concentrations (SSC) and disturbance of contaminated sediment

5.9.64 During construction, disturbance of sediment is expected to occur along the entire route of the Offshore Scheme, particularly during pre-sweeping of sand waves, during which around 250,000 m^3 of sediment is likely to be disturbed. Disturbance of the sediment during construction results in increased levels of SSC. This can have negative impacts on birds through a reduction in water quality, including the resuspension of sediment-bound contaminants into the water column.

5.9.65 Sediment-bound contaminants could include pollutants such as organic compounds, oil, and heavy metals can directly and indirectly impact waterbirds and/or seabirds, resulting in immunosuppression and genotoxicity disruption (Richard, Southern, Gigauri, & Bellini, 2021). Diving species such as red-throated diver are considered to be the most sensitive to such contamination due to the amount of time they spend in the water column compared to non-diving species.

5.9.66 Other, non-diving species, including intertidal waterbirds could also be affected by disturbance to sediment-bound contaminants. During chemical analysis of sediment samples taken in the Study Area (see **Application Document 6.2.4.2 Part 4 Marine Chapter 2 Benthic Ecology**) levels of arsenic, lead and copper were found to exceed Canadian Council of Ministers of the Environment (CCME)[6] Canadian Sediment Quality Guidelines (CSQG), and lead and copper to exceed Centre for Environment, Fisheries and Aquaculture Science (Cefas) Action Level 1[7] near the Pegwell Bay landfall.

5.9.67 Disturbance of sediment and therefore mobilisation of sediment-bound contaminants and the limited effects on prey species are expected to be highly localised with any suspended sediment and subsequent plumes expected to be deposited within a few kilometres of the disturbance. Therefore, any increase in SSC affecting water quality is also expected to be short-term in any one area. In addition, the North Sea is frequently subjected to sediment disturbance due to wave action, currents and storms. As a result, any mobilized pollutants are expected to disperse rapidly.

5.9.68 Although the total volume of sediment to be disturbed during pre-sweeping is 250,000 m^3 (which is considered to represent the worst-case scenario for sediment disturbance), the amount of sediment disturbed at any one time is expected to be much smaller, due to the movement of vessels and equipment along the cable route. Therefore, the impact of alteration of water quality on ornithological features during construction, which are of low to high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is considered to be not significant.

[6] https://www.pla.co.uk/Environment/Canadian-Sediment-Quality-Guidelines-for-the-Protection-of-Aquatic-Life

[7] https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans###Suitability%20of%20material

Operation and Maintenance Phase

Disturbance and displacement of birds

5.9.69 The cable system installation is designed such that a regular maintenance regime is not required to maintain the integrity of the link. DTAS (Digital Temperature and Acoustic Sensing) HVDC status monitoring via fibre optic cable (innovative in-situ monitoring of cable via near real-time temperature and acoustic monitoring which can inform of changes to the cable by intrusive contact as well as variations in depth of burial dependent on thermal changes on the baseline conditions) will be undertaken remotely over the project lifetime. Further to DTAS monitoring where anomalies are identified, routine inspections may be required to observe and identify any potential changes to the as 'built status' of the cable. This may include visual (GVI), where visibility and sensors allow, bathymetric and depth of lowering (cable tracker) data to compare against the baseline survey data.

5.9.70 The overall maintenance strategy will be finalised once the detailed design and technical specifications of the Offshore Scheme infrastructure are known. Maintenance on the cable may be required, which could include the addition of mattresses, rock or grout bags, additional trenching, installation of remedial rock berms or removal of excess sand depth (**Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project**). A repair preparedness plan (RRP) will be prepared in the event a repair is required.

Red-throated diver

5.9.71 All routine operation and maintenance surveys ~~(i.e., non-emergency operational and maintenance activities)~~ within the Outer Thames Estuary SPA (and 2 km buffer) will be planned so that they fall outside of the period 1st November – 31st March to avoid impacts on red-throated diver.

~~5.9.71~~5.9.1 Therefore, the direct disturbance and displacement of red-throated diver during routine operation and maintenance, which are of high sensitivity, will be avoided as activities will be scheduled to fall outside of the period 1st November – 31st March. As such this has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

~~5.9.72~~5.9.2 Unplanned and time-critical 'emergency' repair work is not a routine operational and maintenance activity and does not form part of the Proposed Project. In addition to the duties of the Applicant as a Competent Authority,~~Although emergency cable repairs are unforeseeable and are therefore not assessable as part of the Proposed Project, ii~~In accordance with **Application Document 7.8 Red Throated Diver Protocol** which will apply for the lifetime of the Proposed Project, if any emergency ~~operation and maintenance activities~~cable repairs within the Outer Thames Estuary SPA (and 2 km buffer) during the period of the 1 November – 31 March are required, a report would be provided to Natural England detailing the nature of the event and the specific location, duration and extent of works undertaken, including associated vessel transits and submitted to the MMO no more than four weeks post conclusion of the emergency works. Consultation will be undertaken with the MMO and Natural England as appropriate during this period to ensure the timely repair of any infrastructure whilst minimising disturbance to red-throated diver as far as practicable.

~~5.9.73 Therefore, the impact of direct disturbance and displacement of red-throated diver during routine operation and maintenance, which are of high sensitivity, will be avoided~~

~~as activities will be scheduled to fall outside of the period 1st November – 31st March. As such, this has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.~~

Breeding and non-breeding seabirds

~~5.9.74~~5.9.3 Other seabird species likely to be present in the Offshore Scheme (excluding red-throated diver) are considered to be less sensitive to disturbance from vessels (Fliessbach, et al., 2019; MMO, 2018). Therefore, the addition of one small support vessel operating for a short period of time during the operation phase is not expected to result in levels of displacement which differ to the baseline conditions.

~~5.9.75~~5.9.4 The small area within which maintenance and survey support vessels are expected to be working at any one time is considered to be very small compared to the total available and suitable habitat for seabirds. Many seabirds have very long foraging ranges (Woodward, Thaxter, Owen, & Cook, 2019) and therefore if disturbance and displacement does occur, any affected seabirds are expected to find alternative areas of habitat for the period of disturbance.

~~5.9.76~~5.9.5 Therefore, the impact of direct disturbance and displacement of other seabird species (excluding red-throated diver) during operation and maintenance, which are of high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Non-breeding waterbirds

~~5.9.77~~5.9.6 There is potential for maintenance and repair activities around the HDD exit pits during operation of the Proposed Project which could result in disturbance to waterbirds using nearby intertidal habitat at both landfalls. To minimise the level of disturbance and displacement to waterbirds at the landfalls, a spare conduit will be installed at each landfall location to allow a new section of cable to be installed, if the cable issue is a high-risk repair. However, this would still require the use of small numbers of vessels and/or barges.

~~5.9.78~~5.9.7 The habitat loss expected to occur at the landfalls is outlined in Table 5.16. Each HDD exit duct is expected to require rock protection which will be installed on the seabed. At the Suffolk landfall, rock mattressing will be situated in deeper waters of the subtidal zone where the HDD exit ducts occur. Therefore, impacts to waterbirds will not occur and have not been considered further.

~~5.9.79~~5.9.8 During maintenance and repairs, any required vessels and/or machinery are only expected to be present for a very short period of time compared to during the construction phase. In addition, the area within which maintenance vessels and machinery are expected to be working is very small compared to the total available habitat for waterbirds at both landfalls, with alternative habitat and nearby locations available for foraging.

~~5.9.80~~5.9.9 The addition of a small number of vessels for maintenance in Pegwell Bay is not expected to result in disturbance greater than the baseline conditions. Therefore, the impact of direct disturbance and displacement of waterbird species during operation and maintenance, which are of high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Loss and disturbance of seabed habitat used by foraging seabirds and waterbirds

5.9.815.9.10 Cable repair during the operation and maintenance phase could result in some small-scale loss and disturbance of seabed habitats. This could also result in minor loss or disturbance of prey habitat, such as herring and sandeel grounds.

5.9.825.9.11 Any cable repair during the operation and maintenance phase is expected to be highly localised and limited, resulting in very minor disturbance. Due to the dynamic nature of the North Sea and natural movement of sediment, habitats are expected to recover quickly, allowing prey species to return to the area. As shown in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology**, the available suitable habitat for herring and sandeel in the North Sea is large, and therefore, small-scale disturbance due to any cable repairs or maintenance during the operation phase is not expected to negatively affect abundance of prey available for seabirds. In addition, in the event that disturbance and displacement does occur, the long foraging ranges of seabirds (Woodward, Thaxter, Owen, & Cook, 2019) will allow alternative foraging areas to be found for a short period of time, before returning to usual foraging grounds.

5.9.835.9.12 Any maintenance and repair works required around the HDD exit points at the Kent landfall in Pegwell Bay are also likely to disturb habitat in the intertidal areas for non-breeding waterbirds. However, these works are only expected to affect a very small area of intertidal habitat, compared to the total available suitable habitat for waterbirds in Pegwell Bay.

5.9.845.9.13 Therefore, the impact of direct loss and disturbance of seabed and intertidal habitats on seabirds and waterbirds during operation and maintenance, which are of low to high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Changes in prey availability

5.9.855.9.14 The placement of rock protection could result in permanent habitat loss during the operation and maintenance phase of the Proposed Project. This could result in loss of fish and shellfish habitat, resulting in a reduction in prey availability for seabirds and waterbirds.

Red-throated diver

5.9.865.9.15 Cable protection is expected to be required in one location within the Outer Thames Estuary SPA, for the Farland North crossing, which occurs within preferred habitat for herring and marginal habitat for sandeel. However, this rock protection is only expected to cover a very small area compared to the total available suitable habitat for herring and sandeel in the wider Outer Thames Estuary SPA area. Therefore, impacts to prey availability are considered very limited.

5.9.875.9.16 There is also the potential for remedial cable protection to be required along the Offshore Scheme. However, the exact locations are not currently known but is anticipated to be 15% of the Offshore Scheme. Only small proportions of the Offshore Scheme overlap with suitable herring and sandeel habitat that falls within the Outer Thames Estuary SPA. Therefore, assuming all habitat within the Offshore Scheme is lost due to cable protection, only limited areas of the Outer Thames Estuary SPA, and thus limited numbers of prey, would be affected. Furthermore, **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** has concluded that the

permanent placement of cable protection measures on the seabed is expected to have minor effects on herring and sandeel spawning habitat.

5.9.885.9.17 Therefore, the impact of changes in prey availability on red-throated diver during operation and maintenance, which are of high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Breeding and non-breeding seabirds

5.9.895.9.18 Changes in prey availability for seabirds during the operation and maintenance period are expected to be limited, due to the small scale of works expected, compared to construction.

5.9.905.9.19 The placement of rock protection in the Offshore Scheme is expected to result in total habitat loss 11.24 km² for herring and 13.92 km² for sandeel preferred spawning grounds. Compared to the overall suitable habitat for both species within the wider North Sea, this is expected to be minimal. Furthermore, any habitat loss will be highly localised. Therefore, the effects on prey availability for seabirds are also expected to be minimal.

5.9.915.9.20 It is not currently known where additional cable protection or maintenance works will be required during operation. Therefore, the full effect on herring and sandeel habitat during this phase is uncertain. However, **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology** has concluded that effects of permanent habitat loss on herring and sandeel are predicted to be minor, due to the wider availability of other more important spawning areas nearby, the localised nature of the works, and the recoverability of the habitat. Therefore, effects on prey availability for seabirds are expected to be very limited.

5.9.925.9.21 As a result, the impact of changes in prey availability on seabirds during operation and maintenance, which are of low to medium sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Waterbirds

5.9.935.9.22 Changes in prey availability for waterbirds during the operation and maintenance period are also expected to be limited, due to the small scale of works expected, compared to construction. Waterbirds expected to be present in the intertidal zones of Pegwell Bay during maintenance works largely forage for small crustaceans and worms on the intertidal mudflats and in saltmarsh (The Wildlife Trusts, 2024). The assessment for operational disturbance and loss to benthic habitats concluded that any effects would be minor and not significant (see **Application Document 6.2.4.2 Part 4 Marine Chapter 3 Benthic Ecology**)

5.9.945.9.23 Therefore, the impact of changes in prey availability on waterbirds during operation and maintenance, which are of low sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Alteration of water quality due to increased suspended sediment concentrations (SSC) and disturbance of contaminated sediment

5.9.955.9.24 During operation, there is the potential for small increases in SSC and therefore elevated concentrations of sediment-bound contaminants during maintenance and

repair work, and during regular monitoring surveys, which could affect both seabirds and waterbirds.

~~5.9.96~~5.9.25 However, any repair work is planned to be minor and occasional, with only small areas of sediment disturbance. Any disturbed sediment and subsequent sediment plumes are expected to disperse and settle back to the seabed rapidly within a few kilometres of the disturbance as a worst case (see **Application Document 6.2.4.1 Part 4 Marine Chapter 1 Physical Processes**). Similarly, sediment-bound contaminants are expected to be diluted within a similar distance from the disturbance. Therefore, minimal alterations to water quality are expected in highly localised areas. As a result, the impact of alteration of water quality on ornithological features during operation and maintenance, which are of low to high sensitivity, has been assessed as having a magnitude of negligible which results in a **negligible** effect, which is not significant.

Decommissioning Phase

~~5.9.97~~5.9.26 Activities during the decommissioning phase will occur on a much smaller scale compared to construction and therefore the magnitude of disturbance is also expected to be smaller. All of the impact pathways identified during construction and operation and maintenance are expected to result in non-significant effects. Therefore, due to the smaller scale of disturbance during decommissioning, the effects during the decommissioning stage are also expected to be **negligible** and non-significant.

~~5.9.98~~5.9.27 Following the completion of the Operational phase, the Decommissioning phase will take place. As this work is planned decades into the future, it is unknown what the exact methodology will be for decommissioning, as this will be based on the Best Available Technology (BAT) available at the time of decommissioning.

~~5.9.99~~5.9.28 In the years leading up to the end of the Project's operational life, options for decommissioning will be evaluated through integrated environmental, technical, and economic assessments. The objective in undertaking these assessments will be to minimise the short- and long-term effects on the environment, whilst ensuring that the sea is safe for other users to navigate. The level of decommissioning will be based upon the regulations, best practices, and available technology at the time of decommissioning. The principal options for decommissioning include:

- Full cable removal; and
- Leaving the cable buried in-situ.

~~5.9.100~~5.9.29 In the event of the full removal of the cable, this would have the potential to cause similar impacts on ornithological features as the Construction Phase of the Proposed Project. Should the cable be left in-situ, there would likely be no impact pathways to ornithological receptors. Thus, as a worst-case scenario, impacts during decommissioning may be of a similar magnitude to Construction Phase activities, depending upon the decommissioning option selected. Therefore, as a worst case, the effects to birds are predicted to be **minor** and therefore not significant.

5.10 Additional Mitigation

5.10.1 Where potential likely significant adverse effects are identified after considering embedded and control measures, 'additional mitigation measures' are proposed to further reduce, mitigate or offset the identified adverse environmental effects.

5.10.2 Mitigation measures are additional topic and site-specific measures that have been applied to mitigate or offset any likely significant effects. The assessment presented in Section 5.9 has concluded that no additional mitigation measures are required.

5.11 Residual Effects and Conclusions

5.11.1 Based on the assessment provided in Section 5.9, there are no significant residual effects expected to occur as a result of the Proposed Project.

Sensitivity Assessment

5.11.1 The construction of the Offshore Scheme could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Whilst there may be some minor changes to the baseline conditions, the effects reported within this chapter would not be any different if the works were to commence in any year up to year five.

5.12 Transboundary Effects

5.12.1 A transboundary effect is any significant adverse effect on the environment resulting from human activity, the physical origin of which is situated wholly or in part within an area under the jurisdiction of another State.

5.12.2 All works associated with the Proposed Project fall within the UK jurisdiction (12 NM). Given the distance of the Proposed Project from French waters (approximately 25 km), no significant transboundary effects have been identified. Predicted impacts from the Proposed Project are short term and localised and are therefore not anticipated to be sufficient to influence ornithology receptors outside UK waters, and subsequently cause transboundary effects.

Table 5.18 Summary of marine ornithology effects

Phase	Receptor	Sensitivity	Impact	Effect		Additional Mitigation Measures	Residual Effect	
				Magnitude	Significance		Magnitude	Significance
Construction Phase	Red-throated diver	High	Direct Disturbance and Displacement of Birds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat	Negligible	Minor adverse (Not Significant)	No	Negligible	Minor adverse (Not Significant)
			Changes in prey availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	Breeding and non-breeding seabirds	Low to medium	Direct Disturbance and Displacement of Birds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat used by foraging	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)

Phase	Receptor	Sensitivity	Impact	Effect		Additional Mitigation Measures	Residual Effect	
				Magnitude	Significance		Magnitude	Significance
			seabirds and waterbirds					
			Changes in prey availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	Non-breeding waterbirds	Medium to High	Direct Disturbance and Displacement of Birds	Small	Minor adverse (Not Significant)	No	Small	Minor adverse (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat used by foraging seabirds and waterbirds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Changes in Prey Availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	All ornithological features	Low to high	Alteration of Water Quality due to Increased Suspended Sediment Concentrations (SSC) and	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)

Phase	Receptor	Sensitivity	Impact	Effect		Additional Mitigation Measures	Residual Effect	
				Magnitude	Significance		Magnitude	Significance
			Disturbance of Contaminated Sediment					
Operation Phase	Red-throated diver	High	Direct Disturbance and Displacement of Birds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Changes in Prey Availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	Breeding and non-breeding seabirds	Low to medium	Direct Disturbance and Displacement of Birds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)

Phase	Receptor	Sensitivity	Impact	Effect		Additional Mitigation Measures	Residual Effect	
				Magnitude	Significance		Magnitude	Significance
			Changes in Prey Availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	Non-breeding waterbirds	Medium to high	Direct Disturbance and Displacement of Birds	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Direct Loss and Disturbance of Seabed Habitat	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
			Changes in Prey Availability	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)
	All ornithological features	Low to high	Alteration of Water Quality due to Increased Suspended Sediment Concentrations (SSC) and Disturbance of Contaminated Sediment	Negligible	Negligible (Not Significant)	No	Negligible	Negligible (Not Significant)

Phase	Receptor	Sensitivity	Impact	Effect		Additional Mitigation Measures	Residual Effect	
				Magnitude	Significance		Magnitude	Significance
Decommissioning Phase	Potential effects the same as route preparation and cable installation							

5.13 References

Adams, C., Fernandez-Juricic, E., Bayne, E., & St Clair, C. (2021). Effects of artificial light on bird movement and distribution: a systematic map. *Environmental Evidence, 10*(1), 1-28.

Bibby, C., Burgess, N., Hill, D., & Mustoe, S. (2000). *Bird Census Techniques.* London: BTO.

British Trust for Ornithology. (2023). *BirdFacts*. Retrieved 07 22, 2024, from https://www.bto.org/understanding-birds/welcome-birdfacts

CIEEM. (2018). *Guidelines for Ecological Impact Assessment in Britain and Ireland – Terrestrial, Freshwater, Coastal and Marine.* Winchester: Chartered Institute of Ecology and Environmental Management.

Cutts, N., & Allan, J. (1999). *Avifaunal Disturbance Assessment. Flood Defences Works: Saltend.* Report to Environment Agency.

Davis, S., Sharps, E., Brown, A., Lock, L., Wilson, L., & Bolton, M. (2018). *Breeding success of sympatric Herring Gulls Larus argentatus and Lesser Black-backed Gulls Larus fuscus breeding at two adjacent colonies with contrasting population trends. RSPB Research Report 62.* Bedfordshire: RSPB Centre for Conservation Science.

Department Energy Security and Net Zero. (2023c). *National Policy Statement for Electrical Networks Infrastructure (EN-5).* UK: Department Energy Security and Net Zero.

Department for Energy Security and Net Zero. (2023a). *Overarching National Policy Statement for Energy (EN-1). Presented to the Houses of Parliament pursuant to section 9(8) of the Planning Act 2008.* UK: Department for Energy Security and Net Zero.

Department for Energy Security and Net Zero. (2023b). *National Policy Statement for Renewable Energy Infrastructure (EN-3). Presented to the Houses of Parliament pursuant to section 9(8) of the Planning Act 2008.* UK: Department for Energy Security and Net Zero.

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government. (2016). *Guidance: Natural Environment*. Retrieved 07 17, 2024, from Guidance: Natural Environment: https://www.gov.uk/guidance/natural-environment

EDF Energy. (2020). *The Sizewell C Project: Volume 2 Main Development Site – Chapter 14 Terrestrial Ecology and Ornithology*. Retrieved 07 19, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010012/EN010012-001844-SZC_Bk6_ES_V2_Ch14_Terrestrial%20Ecology%20and%20Ornithology.pdf

Fliessbach, K., Borkenhagen, K., Guse, N., Markones, N., Schwemmer, P., & Garthe, S. (2019). A Ship Traffic Disturbance Vulnerability Index for Northwest European Seabirds as a Tool for Marine Spatial Planning. *Frontiers in Marine Science, 6*(192).

Frederiksen, M., Moe, B., Daunt, F., Phillips, R., Barrett, R., Bogdanova, M., . . . Christensen-Dalsgaard, S. (2012). Multicolony tracking reveals the winter distribution of a pelagic seabird on an ocean basin scale. *Diversity and Distributions, 18*(6), 530-542.

Galloper Wind Farm Limited. (2011). *Galloper Wind Farm Project: Environmental Statement – Non-Technical Summary. Document Reference: 5.1*. Retrieved 07 19, 2024, from https://galloperwindfarm.com/wp-content/uploads/2022/03/ES_Non-Technical_Summary.pdf

Garthe, S., & Hüpop, O. (2004). Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. *Journal of Applied Ecology, 41*(4), 724-734.

Gilbert, G., Gibbons, D., & Evans, J. (1998). *Bird Monitoring Methods: A Manual of Techniques for UK Key Species.* Bedfordshire, England: The Royal Society for the protection of Birds.

GREP. (2002). *Kentish Flats Offshore Wind Farm Environmental Statement*. Retrieved 07 19, 2024, from https://www.marinedataexchange.co.uk/details/776/2002-global-renewable-energy-partners-grep-uk-marine-ltd-kentish-flats-offshore-wind-farm-environmental-statement/summary

HM Government. (1981). *Wildlife and Countryside Act 1981*. Retrieved 07 17, 2024, from Wildlife and Countryside Act 1981: https://www.legislation.gov.uk/ukpga/1981/69/contents

HM Government. (2000). *Countryside and Rights of Way Act 2000 (as amended)*. Retrieved 07 17, 2024, from Countryside and Rights of Way Act 2000 (as amended): https://www.legislation.gov.uk/ukpga/2000/37/contents

HM Government. (2006). *Section 41 of the NERC 2006*. Retrieved 07 17, 2024, from Section 41 of the NERC 2006: https://www.legislation.gov.uk/ukpga/2006/16/section/41
HM Government. (2009). *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive)*. Retrieved 07 17, 2024, from Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive): https://www.legislation.gov.uk/eudr/2009/147
HM Government. (2009). *Marine and Coastal Access Act*. Retrieved 07 17, 2024, from Marine and Coastal Access Act: https://www.legislation.gov.uk/ukpga/2009/23/contents
HM Government. (2010). *The Marine Strategy Regulations 2010*. Retrieved 07 17, 2024, from The Marine Strategy Regulations 2010: https://www.legislation.gov.uk/uksi/2010/1627/contents/made
HM Government. (2011). *UK Marine Policy Statement*. Retrieved 07 17, 2024, from UK Marine Policy Statement: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf
HM Government. (2014). *East Inshore and East Offshore Marine Plan*. Retrieved 07 17, 2024, from East Inshore and East Offshore Marine Plan: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312496/east-plan.pdf
HM Government. (2017). *The Conservation of Habitats and Species Regulations 2017*. Retrieved 07 17, 2024, from The Conservation of Habitats and Species Regulations 2017: https://www.legislation.gov.uk/uksi/2017/1012/contents/made
HM Government. (2017). *The Conservation of Offshore Marine Habitats and Species Regulations 2017*. Retrieved 07 17, 2024, from https://www.legislation.gov.uk/uksi/2017/1013/contents/made
HM Government. (2019). *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.* Retrieved 07 17, 2024, from https://www.legislation.gov.uk/ukdsi/2019/9780111176573
HM Government. (2021). *Environment Act 2021*. Retrieved 07 17, 2024, from Environment Act 2021: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted
HM Government. (2021). *South East Inshore Marine Plan*. Retrieved 07 17, 2024, from South East Inshore Marine Plan: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004493/FINAL_South_East_Marine_Plan__1_.pdf
JNCC. (2015). *Standard Data Form: Alde-Ore Estuary.* Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9009112.pdf
JNCC. (2015). *Standard Data Form: Thanet Coast and Sandwich Bay SPA*. Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9012071.pdf
JNCC. (2020). *Outer Thames Estuary SPA*. Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/outer-thames-estuary-spa/
JNCC. (2021). *Arctic tern (Sterna paradisaea)*. Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/arctic-tern-sterna-paradisaea/#:~:text=Arctic%20terns%20are%20the%20commonest%20tern%20breeding%20in,in%20the%20Northern%20Isles%2C%20with%2073%25%20occurring%20there
JNCC. (2021). *Black-headed gull (Chroicocephalus ridibundus)*. Retrieved 07 22, 2024, from https://jncc.gov.uk/our-work/black-headed-gull-chroicocephalus-ridibundus/
JNCC. (2021). *Common gull (Larus canus)*. Retrieved 07 22, 2024, from https://jncc.gov.uk/our-work/common-gull-larus-canus/
JNCC. (2021). *Common tern (Sterna hirundo)*. Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/common-tern-sterna-hirundo/#:~:text=Common%20terns%20are%20not%20the%20most%20abundant%20UK,and%20Trent%2C%20and%20along%20rivers%20in%20SE%20Scotland
JNCC. (2021). *Herring gull (Larus argentatus).* Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/herring-gull-larus-argentatus/
JNCC. (2021). *Lesser black-backed gull (Larus fuscus).* Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9009112.pdf
JNCC. (2021). *Little tern (Sterna albifrons).* Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/little-tern-sternula-albifrons/

JNCC. (2021). *Mediterranean gull (Larus melanocephalus)*. Retrieved 07 22, 2024, from https://jncc.gov.uk/our-work/mediterranean-gull-larus-melanocephalus/

JNCC. (2021). *Razorbill (Alca torda)*. Retrieved from JNCC: https://jncc.gov.uk/our-work/razorbill-alca-torda/

JNCC. (2021). *Sandwich tern (Sterna sandvicensis)*. Retrieved 07 22, 2024, from JNCC: https://jncc.gov.uk/our-work/sandwich-tern-sterna-sandvicensis/

JNCC. (2022). *Joint SNCB Interim Advice On The Treatment Of Displacement.* JNCC.

Kent Wildlife Trust. (2023). *Sandwich and Pegwell Bay*. Retrieved 07 22, 2024, from Kent Wildlife Trust: https://www.kentwildlifetrust.org.uk/nature-reserves/sandwich-and-pegwell-bay

MacArthur Green. (2024a). *Five Estuaries Offshore Wind Farm Environmental Statement: Chapter 4 Offshore Ornithology.* Retrieved 08 22, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-000235-6.2.4%20Offshore%20Ornithology%20.pdf

MacArthur Green. (2024b). *Five Estuaries Offshore Wind Farm Environmental Statement: Annex 4.1 Offshore Ornithology Technical Report.* Retrieved 08 22, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-000265-6.5.4.1%20Offshore%20Ornithology%20Technical%20Report%20.pdf

Marine Management Organisation (MMO). (2018). *Displacement and habituation of seabirds in response to marine activities. A report produced for the Marine Management Organisation. MMO Project No: 1139.* MMO.

Ministry for Levelling Up, Housing and Communities. (2024). *National Planning Policy Framework.* Retrieved 07 17, 2012, from https://www.gov.uk/government/publications/national-planning-policy-framework--2

Ministry of Housing, Communities and Local Government. (2024). *National Planning Policy Framework.* Retrieved 10 29, 2024, from https://assets.publishing.service.gov.uk/media/66acffddce1fd0da7b593274/NPPF_with_footnotes.pdf

Mitchell, P., Newton, S., Ratcliffe, N., & Dunn, T. (2004). *Seabird Populations of Britain and Ireland: results of the Seabird 2000 census (1998-2002).* London: T and A.D Poyser.

MMO. (2018). *Displacement and habituation of seabirds in response to marine activities. A report produced for the Marine Management Organisation. MMO Project No: 1139, 69pp.* Retrieved 08 07, 2024, from UK Government: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/715604/Displacement_and_habituation_of_seabirds_in_response_to_marine_activities.pdf

National Grid. (2022). *Sealink Environmental Impact Assessment Scoping Report.* National Grid.

Natural England. (1996). *Alde-Ore Estuary SPA Citation.* Retrieved 07 22, 2024, from Natural England: https://publications.naturalengland.org.uk/publication/5170168510545920

Natural England. (2012). *Technical Information Note TIN133 - Little gull: species information for marine Special Protection Area consultations.* Retrieved 07 25, 2024, from Natural England: publications.naturalengland.org.uk/file/3878684

Natural England. (2019). *Natural England (2019). Digital video aerial surveys of red-throated diver in the Outer Thames Estuary Special Protection Area 2018. Natural England Commissioned Report NECR260.* Natural England.

Natural England. (2021). *Assessment of Coastal Access Proposals between Bawdsey and Aldeburgh on sites and features of nature conservation concern.* Retrieved 07 19, 2024, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956536/bawdsey-aldeburgh-nature-conservation-assessment.PDF

Natural England. (2021). *Assessment of Coastal Access Proposals between Bawdsey and Aldeburgh on sites and features of nature conservation concern.* Retrieved 07 22, 2024, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956536/bawdsey-aldeburgh-nature-conservation-assessment.PDF

Natural England and JNCC. (2010). *Departmental Brief: Outer Thames Estuary Special Protection Area.* Retrieved 07 25, 2024, from http://publications.naturalengland.org.uk/publication/3233957

Natural England and JNCC. (2015). *Departmental Brief: Outer Thames Estuary potential Special Protection Area.* Retrieved 07 22, 2024, from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/579017/outer-thames-departmental-brief.pdf

Natural England. (n.d.). *Citation: Sandwich Bay and Hacklinge Marshes SSSI*. Retrieved 07 22, 2024, from Natural England: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001128.pdf

NatureScot. (2017a). *A Guide to Best Practice for Watching Marine Wildlife SMWWC - Part 2*. Retrieved 07 17, 2024, from https://www.nature.scot/doc/guide-best-practice-watching-marine-wildlife-smwwc-part-2

NatureScot. (2017b). *The Scottish Marine Wildlife Watching Code - Part 1*. Retrieved 07 18, 2024, from https://www.nature.scot/sites/default/files/2017-06/Publication%202017%20-%20The%20Scottish%20Marine%20Wildlife%20Watching%20Code%20SMWWC%20-%20Part%201%20-%20April%202017%20%28A2263518%29.pdf

Neal, K., & Wilson, E. (2008). *Cancer pagurus Edible Crab. In: Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom.* Retrieved 08 07, 2024, from http://www.marlin.ac.uk/species/detail/1179

O'Brien, S., Webb, A., Brewer, M., & Reid, J. (2012). Use of kernel density estimation and maximum curvature to set Marine Protected Area boundaries: Identifying a Special Protection Area for wintering red-throated divers in the UK. *Biological Conservation, 156*, 15-21.

Olin, A., Dück, L., Berglund, P., Karlsson, E., Bohm, M., Olsson, O., & Hentati-Sundberg, J. (2023). Breeding failures and reduced nest attendance in response to heat stress in a high-latitude seabird. *Marine Ecology Progress Series*, HEATav3.

Parsons, M., Lawson, J., Lewis, M., Lawrence, R., & Kuepfer, A. (2015). *Quantifying foraging areas of little tern around its breeding colony SPA during chick-rearing. JNCC Report No. 548.* Peterborough: JNCC.

PMSS. (2005). *Greater Gabbard Offshore Wind Farm Environmental Statement*. Retrieved 07 19, 2024, from https://tethys.pnnl.gov/sites/default/files/publications/greatergabbard2005.pdf

Richard, F.-J., Southern, I., Gigauri, M., & Bellini, G. (2021). Warning on nine pollutants and their effects on avian communities. *Global Ecology and Conservation, 32*(e01898).

Royal HaskoningDHV. (2019a). *East Anglia ONE Offshore Windfarm Environmental Statement: Volume 1 – Chapter 12 Ornithology*. Retrieved 07 17, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-001170-6.1.12%20EA1N%20Environmental%20Statement%20Chapter%2012%20Offshore%20Ornithology.pdf

Royal HaskoningDHV. (2019b). *East Anglia TWO Offshore Windfarm Environmental Statement: Volume 1 – Chapter 12 Ornithology*. Retrieved 07 19, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010078/EN010078-001083-6.1.12%20EA2%20Environmental%20Statement%20Chapter%2012%20Offshore%20Ornithology.pdf

RPS Group Plc. (2005a). *London Array Limited Environmental Statement: Non-Technical Summary*. Retrieved 07 19, 2024, from https://londonarray.com/wp-content/uploads/2020/07/Non-technical-summary.pdf

RPS Group Plc. (2005b). *London Array Limited Environmental Statement: Volume one – Offshore Works*. Retrieved 07 19, 2024, from https://www.marinedataexchange.co.uk/details/992/2003-2005-london-array-offshore-wind-farm-environmental-statement/packages/4122?directory=%2F

RPS Group Plc. (2007). *Gunfleet Sands 2 Offshore Wind Farm Environmental Statement*. Retrieved 07 19, 2024, from https://tethys.pnnl.gov/sites/default/files/publications/GunfleetSands2-ES-2007_0.pdf

RSBP. (2023). *Great black-backed gull*. Retrieved 07 25, 2024, from https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/great-black-backed-gull/

RSBP. (2023). *Kittiwake*. Retrieved 07 25, 2024, from RSBP: https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/kittiwake/

RSPB. (2023). *Guillemot*. Retrieved 07 25, 2024, from RSPB: https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/guillemot/

Rubolini, D., Saino, N., & Møller, A. (2010). Migratory behaviour constrains the phenological response of birds to climate change. *Climate Research, 42*(1), 45-55.

Schwemmer, P., & Garthe, S. (2005). At-sea distribution and behaviour of a surface feeding seabird, the lesser black-backed gull Larus fuscus, and its association with different prey. *Marine Ecology Progress Series*, 245-258.

Schwemmer, P., & Garthe, S. (2006). Spatial patterns in at-sea behaviour during spring migration by little gulls (Larus minutus) in the southeastern North Sea. *Journal of Ornithology, 147*, 354-366.

Showler, D., Stewart, D., Sutherland, W., & Pullin, A. (2010). What is the Impact of Public Access on the Breeding Success of Ground-Nesting and Cliff-Nesting Birds. *Systematic Review, 16*.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., . . . Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds, 14*, 25.

The Planning Inspectorate. (2022). *Scoping Opinion: Proposed Sea Link. Case Reference: EN020026.* Retrieved 07 24, 2024, from https://infrastructure.planninginspectorate.gov.uk/projects/south-east/sea-link/

The Wildlife Trusts. (2024). *Birds*. Retrieved October 22, 2024, from The Wildlife Trusts: https://www.wildlifetrusts.org/wildlife-explorer/birds

Van der Kooij, J., Scott, B., & Mackinson, S. (2008). The effects of environmental factors on daytime sandeel distribution and abundance on the Dogger Bank. *Journal of Sea Research, 60*(3), 201-209.

Vattenfall. (2009). *Kentish Flats Offshore Wind Farm FEPA Monitoring Summary Report*. Retrieved 07 19, 2024, from https://www.marinedataexchange.co.uk/details/810/2004-2008-offshore-environmental-solutions-ltd-kentish-flats-offshore-wind-farm-fepa-monitoring-summary/packages/3469?directory=%2F

Vattenfall. (2010a). *Kentish Flats Offshore Wind Farm Extension Environmental Scoping Study*. Retrieved 07 19, 2024, from https://tethys.pnnl.gov/sites/default/files/publications/Haskoning2010.pdf

Vattenfall. (2010b). *Kentish Flats Offshore Wind Farm: Diver Surveys 2009-10*. Retrieved 07 19, 2024, from https://tethys.pnnl.gov/sites/default/files/publications/Pervical-2010.pdf

Vattenfall. (2018). *Thanet Extension Offshore Wind Farm – Annex 4-1: Baseline Technical Report – Offshore Ornithology. Document Reference: 6.4.4.1.* Retrieved 07 19, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010084/EN010084-000632-6.4.4.1_TEOW_Off%20Orn%20Baseline%20Tech%20Rep.pdf

Vattenfall. (2018a). *Thanet Extension Offshore Wind Farm – Annex 4-1: Baseline Technical Report – Offshore Ornithology. Document Reference: 6.4.4.1.* Retrieved 07 17, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010084/EN010084-000632-6.4.4.1_TEOW_Off%20Orn%20Baseline%20Tech%20Rep.pdf

Vattenfall. (2018b). *Thanet Extension Offshore Wind Farm – Environmental Statement Volume 2: Chapter 4: Offshore Ornithology. Document Reference: 6.2.4.* Retrieved 07 18, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010084/EN010084-000600-6.2.4_TEOW_Ornith.pdf

Vattenfall. (2018c). *Thanet Extension Offshore Wind Farm – Annex 5-4: Baseline Onshore and Intertidal Ornithology Report. Document Reference: 6.5.5.4.* Retrieved 07 25, 2024, from https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010084/EN010084-000653-6.5.5.4_TEOW_OrnithologyBaseline.pdf

Waggit, J., Evans, P., Andrade, J., Banks, A., Boisseau, O., Bolton, M., . . . Hiddink, J. (2019). Distribution maps of cetacean and seabird populations in the North-East Atlantic. *Journal of Applied Ecology, 57*(2), 253-269. doi:10.1111/1365-2664.13525

Webb, A., Dean, B., O'Brien, S., Söhle, I., McSorley, C., Reid, J., . . . Hall, C. (2009). *The numbers of inshore waterbirds using the Greater Thames during the non-breeding season; an assessment of the area's potential for qualification as a marine SPA. JNCC Report, No. 374.* Peterborough: JNCC.

Wilson, L., Black, J., Brewer, M., Potts, J., Kuepfer, A., Win, I., . . . Webb, A. (2014). *Quantifying usage of the marine environment by terns Sterna sp. around their breeding colony SPAs. JNCC Report No. 500.* Peterborough: JNCC.

Woodward, I., Thaxter, C., Owen, E., & Cook, A. (2019). *Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report No. 724. Report of work carried out by the British Trust for Ornithology.* Thetford, Norfolk: The British Trust for Ornithology.

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