DOGGER BANK D WIND FARM

Preliminary Environmental Information Report

Volume 1
Chapter 23 Onshore Ecology and Ornithology

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Prepared By**: Royal HaskoningDHV**	Prepared For: **Dogger Bank D Offshore Wind Farm**

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Glossary

Term	Definition
Additional Mitigation	Measures identified through the EIA process that are required as further action to avoid, prevent, reduce or, if possible, offset likely significant adverse effects to acceptable levels (also known as secondary (foreseeable) mitigation). All additional mitigation measures adopted by the Project are provided in the Commitments Register.
Birkhill Wood Substation	The onshore grid connection point for DBD identified through the Holistic Network Design process. Birkhill Wood Substation which is being developed by National Grid Electricity Transmission and does not form part of the Project.
Commitment	Refers to any embedded mitigation and additional mitigation, enhancement or monitoring measures identified through the EIA process and those identified outside the EIA process such as through stakeholder engagement and design evolution. All commitments adopted by the Project are provided in the Commitments Register.
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity / value / importance, defined in terms of significance.
Embedded Mitigation	Embedded mitigation includes: • Measures that form an inherent part of the project design evolution such as modifications to the location or design of the development made during the pre-application phase (also known as primary (inherent) mitigation); and • Measures that will occur regardless of the EIA process as they are imposed by other existing legislative requirements or are considered as standard or best practice to manage commonly occurring environmental impacts (also known as tertiary (inexorable) mitigation). All embedded mitigation measures adopted by the Project are provided in the Commitments Register.
Energy Storage and Balancing Infrastructure (ESBI)	A range of technologies such as battery banks to be co-located with the Onshore Converter Station, which provide valuable services to the electrical grid such as storing energy to meet periods of peak demand and improving overall reliability.

Term	Definition
Enhancement	Measures committed to by the Project to create or enhance positive benefits to the environment or communities, as a result of the Project. All enhancement measures adopted by the Project are provided in the Commitments Register.
Environmental Impact Assessment (EIA)	A process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders which includes a Steering Group and Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.
Grid Connection	The offshore and onshore electricity transmission network connection to Birkhill Wood Substation.
Haul Roads	Temporary tracks set aside to facilitate transport access during onshore construction works.
Impact	A change resulting from an activity associated with the Project, defined in terms of magnitude.
Jointing Bays	Underground structures constructed at regular intervals along the onshore export cable corridor to facilitate the joining of discrete lengths of the installation of cables.
Landfall	The area on the coastline, south-east of Skipsea, at which the offshore export cables are brought ashore, connecting to the onshore export cables at the transition joint bay above Mean High Water Springs.
Link Boxes	Structures housing electrical equipment located alongside the jointing bays in the onshore export cable corridor and the transition joint bay at the landfall, which could be located above or below ground.

Term	Definition
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development. All mitigation measures adopted by the Project are provided in the Commitments Register.
Mitigation Hierarchy	A systematic approach to guide decision-making and prioritise mitigation design. The hierarchy comprises four stages in order of preference and effectiveness: avoid, prevent, reduce and offset.
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are provided in the Commitments Register.
Onshore Converter Station (OCS)	A compound containing electrical equipment required to stabilise and convert electricity generated by the wind turbines and transmitted by the export cables into a more suitable voltage for grid connection into Birkhill Wood Substation.
Onshore Converter Station (OCS) Zone	The area within which the Onshore Converter Station and Energy Storage and Balancing Infrastructure will be located in vicinity of Birkhill Wood Substation.
Onshore Development Area	The area in which all onshore infrastructure associated with the Project will be located, including any temporary works area required during construction and permanent land required for mitigation and enhancement areas, which extends landward of Mean Low Water Springs. There is an overlap with the Offshore Development Area in the intertidal zone.
Onshore Export Cable Corridor (ECC)	The area within which the onshore export cables will be located, extending from the landfall to the Onshore Converter Station zone and onwards to Birkhill Wood Substation.
Onshore Export Cables	Cables which bring electricity from the transition joint bay at landfall to the Onshore Converter Station zone (HVDC cables) and from the Onshore Converter Station zone onwards to Birkhill Wood Substation (HVAC cables).
Project Design Envelope	A range of design parameters defined where appropriate to enable the identification and assessment of likely significant effects arising from a project's worst-case scenario. The Project Design Envelope incorporates flexibility and addresses uncertainty in the DCO application and will be further refined during the EIA process.

Term	Definition
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.
Study Areas	A geographical area and / or temporal limit defined for each EIA topic to identify sensitive receptors and assess the relevant likely significant effects.
Temporary Construction Compounds	Areas set aside to facilitate the construction works for the onshore infrastructure, which include the landfall construction compound, main and intermediate construction compounds for onshore export cable works and OCS and ESBI construction compounds.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'.
The Project	Dogger Bank D Offshore Wind Farm Project, also referred to as DBD in this PEIR.
Transition Joint Bay (TJB)	An underground structure at the landfall that houses the joints between the offshore and onshore export cables.
Trenching	Open cut method for cable or duct installation.
Trenchless Techniques	Trenchless cable or duct installation methods used to bring offshore export cables ashore at landfall, facilitate crossing major onshore obstacles such as roads, railways and watercourses and where trenching may not be suitable. Trenchless techniques included in the Project Design Envelope include Horizontal Directional Drilling (HDD), auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe.

23 Onshore Ecology and Ornithology

23.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary results of the Environmental Impact Assessment (EIA) of the Dogger Bank D Offshore Wind Farm Project (hereafter 'the Project' or 'DBD') on onshore ecology and ornithology.

2. **Chapter 4 Project Description** provides a description of the key infrastructure components which form part of the Project and the associated construction, operation and maintenance (O&M) and decommissioning activities.

3. The primary purpose of the PEIR is to support the statutory consultation activities required for a Development Consent Order (DCO) application under the Planning Act 2008. The information presented in this PEIR chapter is based on the baseline characterisation and assessment work undertaken to date. The feedback from the statutory consultation will be used to inform the final design where appropriate and presented in an Environmental Statement (ES), which will be submitted with the DCO application.

4. The effects on benthic habitats are considered in **Chapter 10 Benthic and Intertidal Ecology**, offshore ecology in **Chapter 11 Fish and Shellfish Ecology**, **Chapter 12 Marine Mammals** and **Chapter 12 Offshore and Intertidal Ornithology**. The effects of potential changes to air quality and potential impacts on designated sites and habitats are discussed in **Chapter 20 Air Quality and Dust.** Habitats Regulations Assessment (HRA) matters are addressed as part of the HRA process, for which the screening stage has been completed to date within the **Report to Inform Appropriate Assessment** (document reference 5.3) published alongside this PEIR.

5. This PEIR chapter:

   - Describes the baseline environment relating to onshore ecology and ornithology;
   - Presents an assessment of the likely significant effects on onshore ecology and ornithology during the construction, O&M and decommissioning phases of the Project;
   - Identifies any assumptions and limitations encountered in compiling the environmental information; and
   - Sets out proposed mitigation measures to avoid, prevent reduce or, if possible, offset potential significant adverse environmental effects identified during the EIA process and, where relevant, monitoring measures or enhancement measures to create or enhance positive effects.

6. This chapter should be read in conjunction with the following related chapters. Inter-relationships are discussed further in **Section 23.9.1**:

   - **Chapter 13 Offshore and Intertidal Ornithology;**
   - **Chapter 19 Geology and Ground Conditions;**
   - **Chapter 20 Air Quality and Dust;**
   - **Chapter 21 Water Resources and Flood Risk;**
   - **Chapter 22 Soils and Land Use;**
   - **Chapter 25 Noise and Vibration;**
   - **Chapter 27 Landscape and Visual Impacts;** and
   - **Chapter 31 Climate Change.**

7. Additional information to support the onshore ecology and ornithology assessment includes:

   - **Volume 2, Appendix 23.1 Consultation Responses for Onshore Ecology and Ornithology;**
   - **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report;**
   - **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note;**
   - **Volume 2, Appendix 23.4 Arboricultural Survey Report;** and
   - **Volume 2, Appendix 23.5 Statutory Biodiversity Metric Calculator.**

23.2 Policy and Legislation

23.2.1 National Policy Statements

8. Planning policy on energy Nationally Significant Infrastructure Projects (NSIP) is set out in the National Policy Statements (NPS). The following NPS are relevant to the onshore ecology and ornithology assessment:

- Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023a);
- NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c).

9. The onshore ecology and ornithology chapter has been prepared with reference to specific requirements in the above NPS. The relevant parts of the NPS are summarised **Table 23-1**, along with how and where they have been considered in this PEIR chapter.

Table 23-1 Summary of Relevant National Policy Statement Requirements for Onshore Ecology and Ornithology

NPS Reference and Requirement	How and Where Considered in the PEIR
NPS for Energy (EN-1)	
Paragraph 4.6.1 – 4.6.1: "Environmental net gain is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. Projects should therefore not only avoid, mitigate and compensate harms, following the mitigation hierarchy, but also consider whether there are opportunities for enhancements." "Biodiversity net gain is an essential component of environmental net gain. Projects in England should consider and seek to incorporate improvements in natural capital, ecosystem services and the benefits they deliver when planning how to deliver biodiversity net gain."	Biodiversity Net Gain (BNG) good practice principles will be followed as part of the approach to delivering BNG alongside the Project. This is detailed further within **Section 23.5.5**.
Paragraph 4.6.6 – 4.6.7: "Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, and the wider environment where possible." "In England applicants for onshore elements of any development are encouraged to use the latest version of the biodiversity metric to calculate their biodiversity baseline and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application"	The Project is committed to delivering at least 10% BNG alongside development. This is an embedded measure of the Project, committed to under CO82 of **Table 23-5**. The latest version of the statutory biodiversity metric has been used within this chapter (**Section 23.6.1.3.4**) and will be updated for ES stage, as detailed under **Section 23.5.5**.
Paragraph 5.4.17: "Where the development is subject to EIA, the applicant should ensure that the ES [Environmental Statement] clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the IPC [Infrastructure Planning Commission] [now the Secretary of State] consider thoroughly the potential effects of a proposed project."	Potential impacts on internationally, nationally and locally designated sites of ecological conservation importance, on protected species and on habitats and other species identified as being of principle importance for the conservation of biodiversity are considered in **Section 23.7.1.1** and **Section 23.7.1.2**.
Paragraph 5.4.19: "The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests."	Embedded mitigation measures are provided in **Section 23.4.3** and where applicable, further mitigation measures are outlined in relation to individual receptors in **Section 23.7**. Geology is addressed in **Chapter 19 Geology and Ground Conditions**.
Paragraph 5.4.2 – Paragraph 5.4.3: "The government's policy for biodiversity in England is set out in the Environmental Improvement Plan 2023176, the National Pollinator Strategy177 and the UK Marine Strategy178. The aim is to halt overall biodiversity loss in England by 2030 and then reverse loss by 2042, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people." "The wide range of legislative provisions at the international and national level that can impact on planning decisions affecting biodiversity and geological conservation issues are set out in a Government Circular. 179 The National Planning Policy Framework and Natural Environment Planning Practice Guidance document sets out good practice in England in relation to planning for biodiversity and geological conservation."	Site selection decisions and embedded mitigation measures have sought to minimise impacts to features of biodiversity. Embedded mitigation measures are provided in **Section 23.4.3** and where applicable, further mitigation measures are outlined in relation to individual receptors in **Section 23.7.** Site selection decisions and embedded mitigation measures have sought to minimise impacts to features of geological interest are addressed in **Chapter 19 Geology and Ground Conditions**.
Paragraph 5.4.4 – Paragraph 5.4.5: "The highest level of biodiversity protection is afforded to sites identified through international conventions. The Habitats Regulations set out sites for which an HRA will assess the implications of a plan or project, including Special Areas of Conservation and Special Protection Areas." "As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations and an HRA will also be required: (a) potential Special Protection Areas and possible Special Areas of Conservation; (b) listed or proposed Ramsar sites; and (c) sites identified, or required, as compensatory measures for adverse effects on any of the other sites covered by this paragraph."	Relevant designated ecological sites are presented in **Section 23.6.1.1** and assessed in **Section 23.7.1.1**. Site selection decisions have sought to minimise interactions with interest features within designated sites. Site selection is addressed in **Chapter 5 Site Selection and Consideration of Alternatives**.

NPS Reference and Requirement	How and Where Considered in the PEIR
Paragraph 5.4.8: "Development on land within or outside a SSSI, 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 (including need) 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 SSSIs."	Effects on designated ecological sites including SSSI are assessed in **Section 23.7.1.2**. Embedded mitigation measures are covered in **Section 23.4.3.**
Paragraph 5.4.12: "Sites of regional and local biodiversity and geological interest, which include Regionally Important Geological Sites, Local Nature Reserves and Local Wildlife Sites, are areas of substantive nature conservation value and make an important contribution to ecological networks and nature's recovery. They can also provide wider benefits including public access (where agreed), climate mitigation and helping to tackle air pollution."	Relevant designated ecological sites are presented in **Section 23.6.1.1** and assessed in **Section 23.7.1.2**. Site selection decisions have sought to avoid and minimise impacts to interest features within designated sites (see **Chapter 5 Site Selection and Consideration of Alternatives**). Impacts to sites of geological interest are assessed in **Chapter 19 Geology and Ground Conditions.**
Paragraph 5.4.53: "The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of any irreplaceable habitats, including ancient woodland, and ancient and veteran trees unless there are wholly exceptional reasons192 and a suitable compensation strategy exists."	Ancient woodland is not present in the Onshore Development Area. Impact to ancient woodland located adjacent to the Onshore Development Area are assessed in **Section 23.7.1.2.**
Paragraph 5.4.46: "Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. The Secretary of State should give appropriate weight to environmental and biodiversity enhancements, although any weight given to gains provided to meet a legal requirement (for example under the Environment Act 2021) is likely to be limited"	Biodiversity Net Gain (BNG) is discussed in **Table 23-5**.
Paragraph 5.4.54 – Paragraph 5.4.55: "The Secretary of State should ensure that species and habitats identified as being of importance for the conservation of biodiversity are protected from the adverse effects of development by using requirements, planning obligations, or licence conditions where appropriate." "The Secretary of State should refuse consent where harm to a protected species and relevant habitat would result, unless there is an overriding public interest and the other relevant legal tests are met. In this context the Secretary of State should give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance or the climate resilience and the capacity of habitats to store carbon, which they consider may result from a proposed development."	Information on habitats is provided in **Section 23.6.1.3.2,** and protected species in **Section 23.6.1.3.5**. The outcome of the assessment process is provided in **Section 23.7**.
Paragraph 5.4.35: "Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; the timing of construction has been planned to avoid or limit disturbance; during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements; habitats will, where practicable, be restored after construction works have finished; opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping proposals. Where habitat creation is required as mitigation, compensation, or enhancement, the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised; mitigations required as a result of legal protection of habitats or species will be complied with."	Embedded mitigation measures are presented in **Section 23.4.3**. Mitigation measures associated with potential impacts are presented in **Section 23.7** in relation to individual receptors.
Paragraph 5.4.45: "The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and the SNCB and the MMO / NRW (where appropriate). The Secretary of State will also need to consider whether the SNCB or the MMO / NRW has granted or refused, or intends to grant	The potential requirement for mitigation licensing for badgers *Meles meles*, bats, otter *Lutra lutra*, and great crested newts (GCN) *Triturus cristatus* is presented in **Section 23.7** and is used as a worst-case scenario.

NPS Reference and Requirement	How and Where Considered in the PEIR
or refuse, any relevant licences, including protected species mitigation licences.”	
NPS for Renewable Energy Infrastructure (EN-3)	
Paragraph 2.5.2: “Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence / co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.”	The site selection process has sought to avoid and minimise impacts to sensitive features where possible (see **Chapter 5 Site Selection and Consideration of Alternatives**). Embedded mitigation measures are presented in **Section 23.4.3** and where applicable, further mitigation measures are outlined in **Section 23.7** in relation to individual receptors.
Paragraph 2.8.221: “Applicants must develop an ecological monitoring programme to monitor impacts during the pre-construction, construction and operational phases to identify the actual impacts caused by the project and compare them to what was predicted in the EIA / HRA.”	As noted in **Section 23.10,** potential monitoring measures for onshore ecology and ornithology will be developed through the EIA process and identified in the ES. Monitoring requirements will be described within the Outline Ecological Management Plan (EcoMP) and the Outline Landscape Management Plan (LMP), to be submitted with the DCO application (see Commitment IDs CO65 and CO81, **Table 23-5** in **Section 23.4.3**).
Paragraph 2.10.69: “Applicants should set out what would be decommissioned and removed from the site at the end of the operational life of the generating station, considering instances where it may be less harmful for the ecology of the site to keep or retain certain types of infrastructure, for example underground cabling, and where there may be socio-economic benefits in retaining site infrastructure after the operational life, such as retaining pathways through the site or a site substation.”	Decommissioning impacts are discussed in **Section 23.7.3.**
NPS for Electricity Networks Infrastructure (EN-5)	
Paragraph 2.1.10: “The applicant should consider and address routing and avoidance / minimisation of environmental impacts both onshore and offshore at an early stage in the development process.”	Embedded mitigation measures are discussed in **Section 23.4.3.**

23.2.2 Other Policy and Legislation

10. Other policy and legislation relevant to the onshore ecology and ornithology assessment is summarised in the following sections.

23.2.2.1 International

11. The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92 / 43 / EEC) (the Habitats Directive) designates important wildlife sites through the EU as Special Areas of Conservation (SAC). Through this legislation, statutory protection is given to habitats and species listed in the Directive as being threatened or of community interest. Sites identified as candidate SAC (cSAC) are provided with the same level of protection as SAC.

12. Habitat types that are considered as being of European Importance are listed in Annex I of the Habitats Directive. Included in this list are a number of 'priority habitat types', which are habitats in danger of disappearing. The natural range of these priority habitats is broadly within the EU. This European law was originally transposed into English and Welsh legislation by The Conservation (Natural Habitats & c.) Regulations 1994, later replaced by Conservation of Habitats and Species Regulations 2017.

13. Changes to the Conservation of Habitats and Species Regulations 2017 (as amended) have been implemented by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The key changes are the creation of a 'National Site Network' (NSN) (which no longer forms part of the EU Natura 2000 network) and the establishment of management objectives for the NSN. The network objectives are to:

    - Maintain or, where appropriate, restore habitats and species listed in Annexes I and II of the Habitats Directive to a favourable conservation status; and,
    - Contribute to ensuring, in their area of distribution, the survival and reproduction of wild birds and securing compliance with the overarching aims of the Wild Birds Directive.

14. Habitats of European-wide importance for birds are listed under the Birds Directive (Directive 2009 / 147 / ED). Habitats designated under this Directive are notified as SPA and are identified for holding populations >1% of the reference population as defined in Appendix 4 of the SPA review of bird species listed in Annex 1 of the same Council Directive. Sites identified as potential SPA (pSPA) are provided with the same level of protection as SPA.

15. Wetlands of international importance (especially as waterfowl habitat) are designated under the Ramsar Convention, an intergovernmental treaty adopted in 1971 which provides a framework for 'the conservation and wise use of wetlands and their resources.'

23.2.2.2 National

16. The National Planning Policy Framework (NPPF) (2024) outlines the UK Government's planning policies for England. Section 15 (Conserving and enhancing the natural environment) provides information on the responsibilities of different stakeholders and the objectives development should seek to achieve with regard to ecological receptors. Elements of Section 15 which are relevant to the Project are detailed further in **Section 23.2.2.2.2** and **Section 23.2.2.2.3.**

17. National ecological designations, such as SSSI and National Nature Reserves (NNR) are also afforded statutory protection. SSSI are notified and protected under the jurisdiction of the Wildlife and Countryside Act 1981 (WCA). SSSI are notified based on specific criteria, including the general condition and rarity of the site and of the species or habitats supported by it.

23.2.2.2.1 Species Designation and Protection

18. Under the Protection of Badgers Act 1992, it is against the law to knowingly kill, capture, disturb or injure an individual badger or to intentionally damage, destroy or obstruct an area used for breeding, resting or sheltering by badgers (i.e. a sett).

19. All bat species are listed under Annex IV (and certain species also under Annex II) of the Habitats Directive and are given UK protected status by Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Bats and their roosts also receive protection from disturbance through the WCA (1981). This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

20. All bird species are protected under the WCA (1981). This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the WCA (1981), which prohibits intentionally or recklessly disturbing the species at, on or near an 'active' nest.

21. All native reptiles are listed on Schedule 5 of the WCA (1981) and are afforded protection under Sections 9(1) and 9(5). For the reptile species adder *Vipera berus*, grass snake *Natrix helvetica* (previously *Natrix natrix*), slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*, this protection prohibits deliberate or reckless killing and injury but does not include habitat protection.

22. International and national legislation is in place which protects GCN completely. This legislation includes Annexes IV and II of the Habitats Directive, Schedule 2 of The Conservation of Habitats and Species Regulations 2017, and Sections 9(4) and 9(5) of the WCA (1981). To kill, injure, disturb, handle or sell the animal all constitute an offence, and this protection is applied to all stages of life. It is against the law to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection, including both the terrestrial and aquatic elements of GCN habitat.

23. Otters are protected in accordance with Schedule 5 of the WCA (1981). The otter is also a protected species included in Annex II of the Habitats Directive and is protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. It is an offence to intentionally kill, injure or take an otter from the wild, or to intentionally or recklessly damage, destroy or obstruct access to any habitat used by otters or to disturb the otters which make use of those habitats.

24. Schedule 5 of the WCA (1981) affords protection for water vole *Arvicola amphibius*. This makes it an offence to intentionally damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection, or to disturb water voles whilst they are using these places. It is an offence to kill, injure, capture or possess the animals.

25. Plant species which are under special protection are listed under Schedule 8 of the of the WCA (1981). This makes it an offence to pick, uproot or destroy any species listed on Schedule 8 without prior authorisation, and section 13 of the WCA (1981) protects all plants from unauthorised uprooting (i.e. without the landowner's permission).

26. The status of flora in England is conveyed using a Vascular Plant Red List for England. This list is measured against the International Union for Conservation of Nature criteria. There are four classifications of what it means for flora to be threatened: Critically Endangered, Endangered, Vulnerable. A threatened or near-threatened status does not provide statutory protection but is recommended to be a priority for conservation in England. It should be noted that 'threat' is not synonymous with 'rarity'; some of the species concerned are relatively common and widespread.

27. Freshwater and migratory fish are afforded protection by the Salmon and Freshwater Fisheries Act 1975 (SAFFA). SAFFA covers a variety of offences including wilful disturbance of spawn, spawning fish or spawning areas; knowingly allowing pollution to enter a watercourse containing fish; and obstruction of fish passage. European eels *Anguilla anguilla* are also afforded specific protection with regards to provision of unhindered passage, under The Eel (England and Wales) Regulations 2009.

23.2.2.2.2 Priority Species and Habitats

28. As per the NPPF (Section 15, Conserving and Enhancing the Natural Environment), local authorities have a responsibility to try to conserve and enhance biodiversity while taking into consideration Species and Habitats of Principal Importance (hereafter referred to as Priority Habitats and Priority Species). The Natural Environment and Rural Communities Act 2006 as amended (NERC Act) (Section 40) contains text on biodiversity duty, which includes all biodiversity, not exclusively Priority Habitats and Species.

29. Section 41 of the NERC Act instructs the Secretary of State to publish lists of Priority Species and Habitats. Priority Species and Habitats in England are those which were identified under the UK Biodiversity Action Plan (BAP) as being in need of action. These species and habitats remain as conservation priorities under the UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee (JNCC), 2012). This does not afford them statutory protection, but rather "specific consideration" when developments and actions are being planned by local authorities, and referral to the list by public bodies when they are complying with their duty as per Section 40.

30. Priority Habitats in East Riding of Yorkshire include, but are not limited to:

- Coastal and floodplain grazing marsh;
- Lowland mixed deciduous woodland;
- Maritime Cliffs and Slopes; and
- Traditional Orchard.

31. Priority Species in East Riding of Yorkshire (which have no specific legal protection) include:

- Hedgehog *Erinaceus europaeus*;
- Polecat *Mustela putorius*;
- Brown hare *Lepus europaeus*;
- Harvest mouse *Micromys minutus*;
- Multiple Birds of Conservation Concern (BoCC5, Stanbury *et al*. 2021) (e.g. song thrush *Turdus philomelos* and house sparrow *Passer domesticus*);
- Common toad *Bufo bufo*;
- European eel *Anguilla anguilla*;
- Multiple invertebrate species; and
- Multiple plant species.

32. This is not a complete list and relies on the submission of records to record centres, so there will be other widespread Priority Species present in the East Riding of Yorkshire that are not represented in the data.

23.2.2.2.3 Biodiversity Policy

33. The NPPF, Section 15 states that development should pursue opportunities for securing measurable net gains for biodiversity. The policy goes on to state that "*…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.*"

23.2.2.2.4 The Hedgerow Regulations

34. It is an offence to remove or destroy certain hedgerows without permission from the Local Planning Authority under the Hedgerow Regulations 1997. In April 2024, the UK government introduced the Management of Hedgerows (England) Regulations 2024, which came into effect on 23rd May 2024. This new legislation provides additional guidelines for hedgerow management, including buffer strips and restrictions on cutting periods. Local authorities are the enforcement body for such offences.

23.2.2.2.5 Irreplaceable Habitats

35. The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 establish guidelines for the protection and management of irreplaceable habitats in England. These habitats are defined as those that are very difficult or take a long time to restore, create, or replace once destroyed, due to their age, uniqueness, species diversity, or rarity. Examples include ancient woodlands, veteran trees, and certain types of wetlands and coastal habitats. These regulations aim to ensure that irreplaceable habitats are given the highest level of protection during the planning and development process, promoting sustainable development and biodiversity conservation.

23.2.2.3 Local

36. Local authorities may designate certain areas as being of local conservation interest. The criteria for inclusion may vary between areas. Most individual counties have a similar scheme; within the East Riding of Yorkshire such sites are designated as Local Wildlife Sites (LWS) and Yorkshire Wildlife Trust reserves (YWT). These sites are considered within the adopted East Riding Local Plan Update 2025-2039 (East Riding of Yorkshire Council (ERYC), 2025) and the East Riding of Yorkshire Biodiversity Action Plan (ERYC, 2010). Designation of such sites does not itself confer statutory protection.

23.3 Consultation

37. Topic-specific consultation in relation to onshore ecology and ornithology has been undertaken in line with the process set out in **Volume 1, Chapter 7 Consultation**. A Scoping Opinion from the Planning Inspectorate was received on 2nd August 2024, which has informed the scope of the assessment presented within this chapter (as outlined in **Section 23.4.2**).

38. Feedback received through the ongoing Evidence Plan Process (EPP) in relation to Expert Topic Group (ETG) meetings and wider technical consultation meetings with relevant stakeholders has also been considered in the preparation of this chapter. Details of technical consultation undertaken to date on onshore ecology and ornithology are provided in **Table 23-2**.

Table 23-2 Technical Consultation Undertaken to Date for Onshore Ecology and Ornithology

Meeting	Stakeholder(s)	Date(s) of Meeting / Frequency	Purpose of Meeting
ETG Meetings			
ETG6 (Onshore Ecology, Ornithology and Land Use) Meeting 02	East Riding of Yorkshire Council, Royal Society for the Protection of Birds, Environment Agency and Natural England *(Yorkshire Wildlife Trusts invited but not able to attend)*	2nd October 2024	To present and agree the approach to data collection for the baseline environment and impact assessment.

39. Following initial scoping of overwintering bird surveys, Natural England was consulted on the Study Area and methodology for overwintering and passage bird baseline characterisation (in context of proximity to the Humber Estuary SPA) in August 2023. In addition, Natural England was consulted on the scope of the Preliminary Ecological Appraisal (PEA) in March 2023 and subsequently agreed at ETG7 Meeting 2 (2nd October 2024) where Natural England confirmed no further comments on the scope. Both onshore and offshore engagement with Natural England will be presented in the Consultation Report, which is to be submitted with the DCO application.

40. **Volume 2, Appendix 23.1 Consultation Responses for Onshore Ecology and Ornithology** summarises how consultation responses received to date are addressed in this chapter.

41. This chapter will be updated based on refinements made to the Project Design Envelope and to consider where appropriate stakeholder feedback on the PEIR. The updated chapter will form part of the ES to be submitted with the DCO application.

23.4 Basis of the Assessment

42. The following sections establish the basis of the assessment of likely significant effects, which is defined by the Study Area(s), assessment scope, and realistic worst-case scenarios.

43. This section should be read in conjunction with **Volume 2, Appendix 1.2 Guide to PEIR**, **Volume 2, Appendix 6.2 Impacts Register** and **Volume 2, Appendix 6.3 Commitments Register**.

23.4.1 Study Area

44. The Onshore Ecology and Ornithology Study Area has been defined on the basis of a range of buffer distances around the Onshore Development Area (**Figure 23-1**). These buffer distances are outlined in **Table 23-3** and shown where relevant on **Figures 23-1, 23-2, 23-3** and **23-4**.

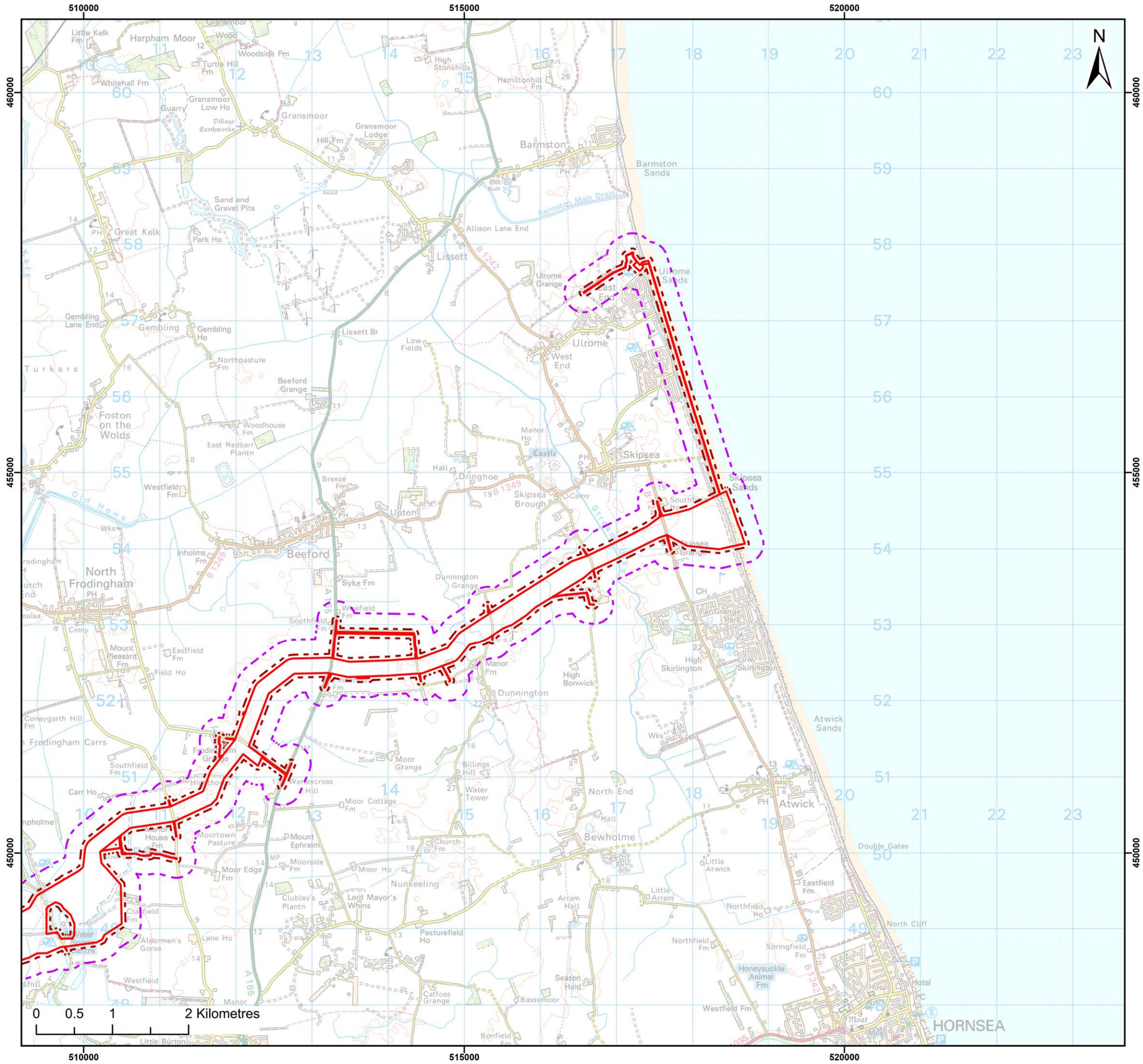
45. With regard to ornithology, buffers which extend seaward beyond Mean High Water Springs (MHWS) are covered within **Chapter 13 Offshore and Intertidal Ornithology**. With regard to other ecological receptors, buffers which extend seaward beyond Mean Low Water Springs (MLWS) are covered within **Chapter 10 Benthic and Intertidal Ecology, Chapter 11 Fish and Shellfish Ecology** and **Chapter 12 Marine Mammals**.

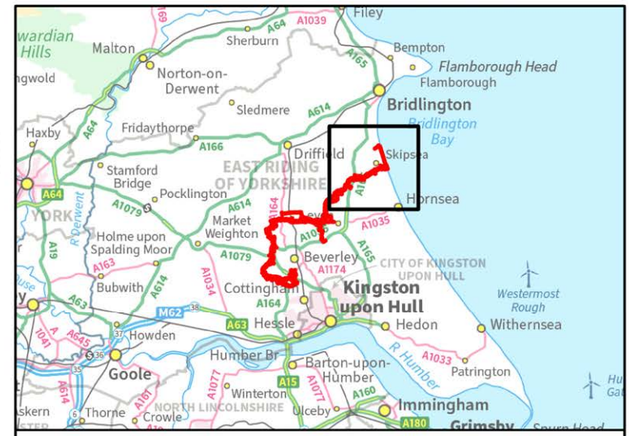
46. The use of a 2km buffer for the onshore ornithology baseline characterisation desk study was agreed with stakeholders at the second meeting of ETG6 (**Volume 2, Appendix 23.1 Consultation Responses for Onshore Ecology and Ornithology**). The results of this desk study are provided within **Section 23.6.1**.

47. Advice was provided by Natural England, through the Discretionary Advisory Service (DAS) for the onshore ornithology assessment to consider potential impacts on land within 10km of the Humber Estuary SPA and Ramsar site as this is defined by Natural England as potential Functionally Linked Land (FLL) of the SPA. Baseline surveys of land in proximity to the Onshore Development Area and within 10km of the Humber Estuary SPA are subjected to twice-monthly survey effort between August 2024 and mid-May 2025 inclusive. The programme includes walked transect, and both daytime and nocturnal vantage point surveys, in order to capture and assess habitat use by birds (in particular SPA species) during passage and overwintering periods. The Zone of Influence (ZoI) for potential impacts on FLL (primarily via noise and visual disturbance) was agreed with Natural England and the ERYC ecologist to be 300m (see **Volume 2, Appendix 23.1 Consultation Responses for Onshore Ecology and Ornithology**).

Table 23-3 Buffer Distances for Each Terrestrial Ecology and Ornithology Receptor

Receptor / Survey Type	Buffer Distances
PEA Survey	50m buffer around Onshore Development Area
Great Crested Newt (GCN) Habitat Suitability Index (HSI) Survey	250m buffer around Onshore Development Area
Overwintering and Passage Bird Surveys	300m buffer for areas of the Onshore Development Area which are located within 10km of the Humber Estuary SPA
Ornithology Desk Study	2km buffer around Onshore Development Area
Non-statutory Designated Site	2km buffer around Onshore Development Area
National Statutory Designated Sites Desk Study	2km buffer around Onshore Development Area as standard, up to 5km buffer where overlapping Impact Risk Zones are present
Local Statutory Designated Sites Desk Study	2km buffer around Onshore Development Area
International Statutory Designated Sites Desk Study	10km buffer around Onshore Development Area





Legend:

- Onshore Development Area
- Preliminary Ecological Appraisal Study Area
- Habitat Suitability Index Study Area

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Field Survey Study Area
- Sheet 1 of 3

Figure: 23-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0315

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	27/03/2025	JH	TC	A3	1:50,000
01	03/12/2024	FC	TC	A3	1:50,000

Co-ordinate system: British National Grid

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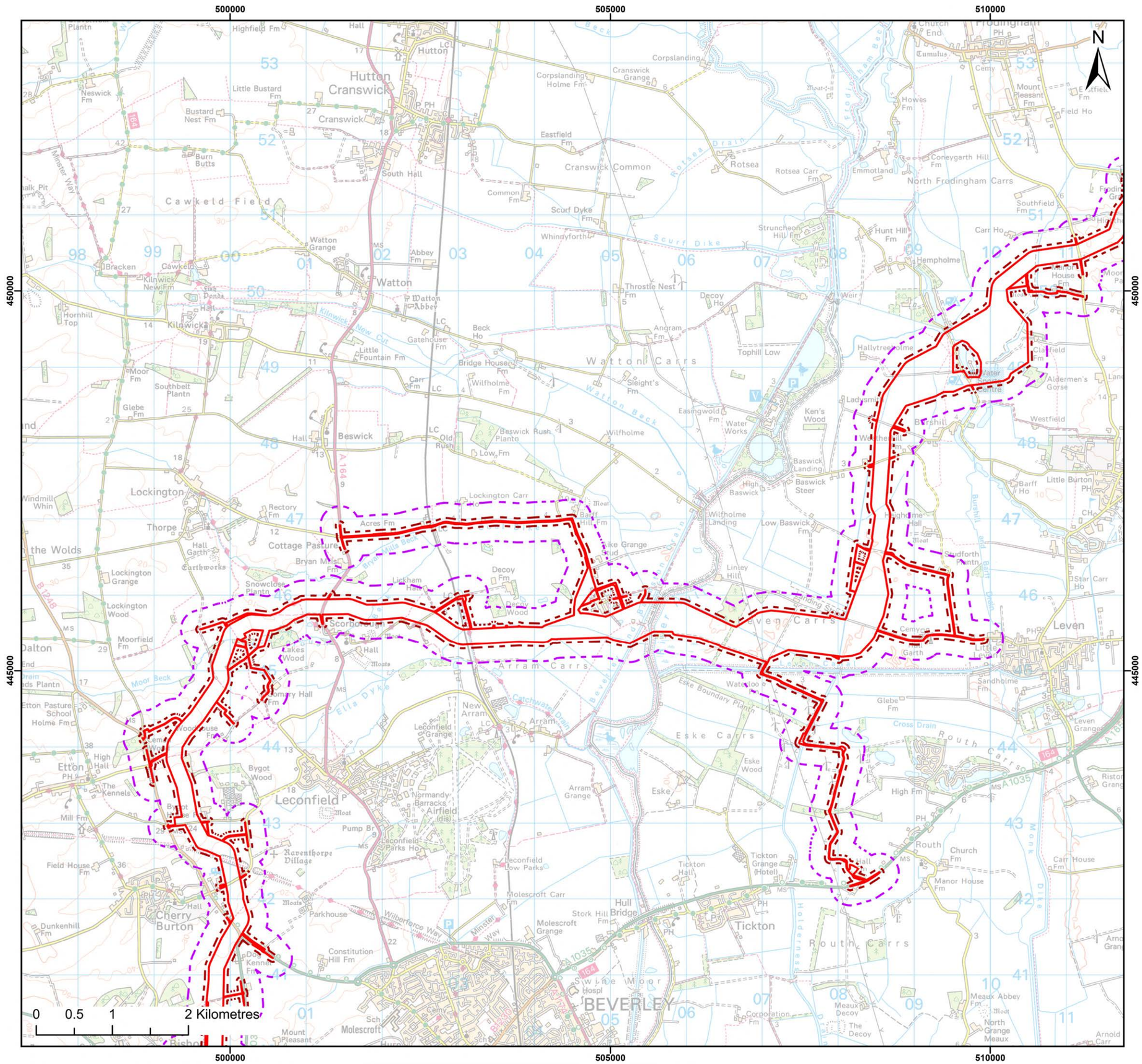

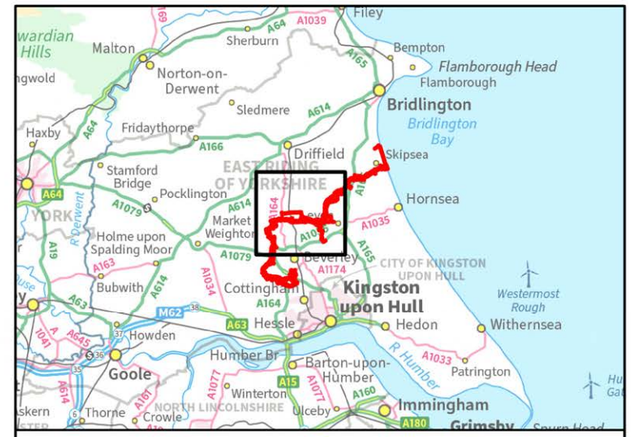

Legend:

- Onshore Development Area
- Preliminary Ecological Appraisal Study Area
- Habitat Suitability Index Study Area

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Field Survey Study Area
- Sheet 2 of 3

Figure: 23-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0315

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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01	03/12/2024	FC	TC	A3	1:50,000

Co-ordinate system: British National Grid

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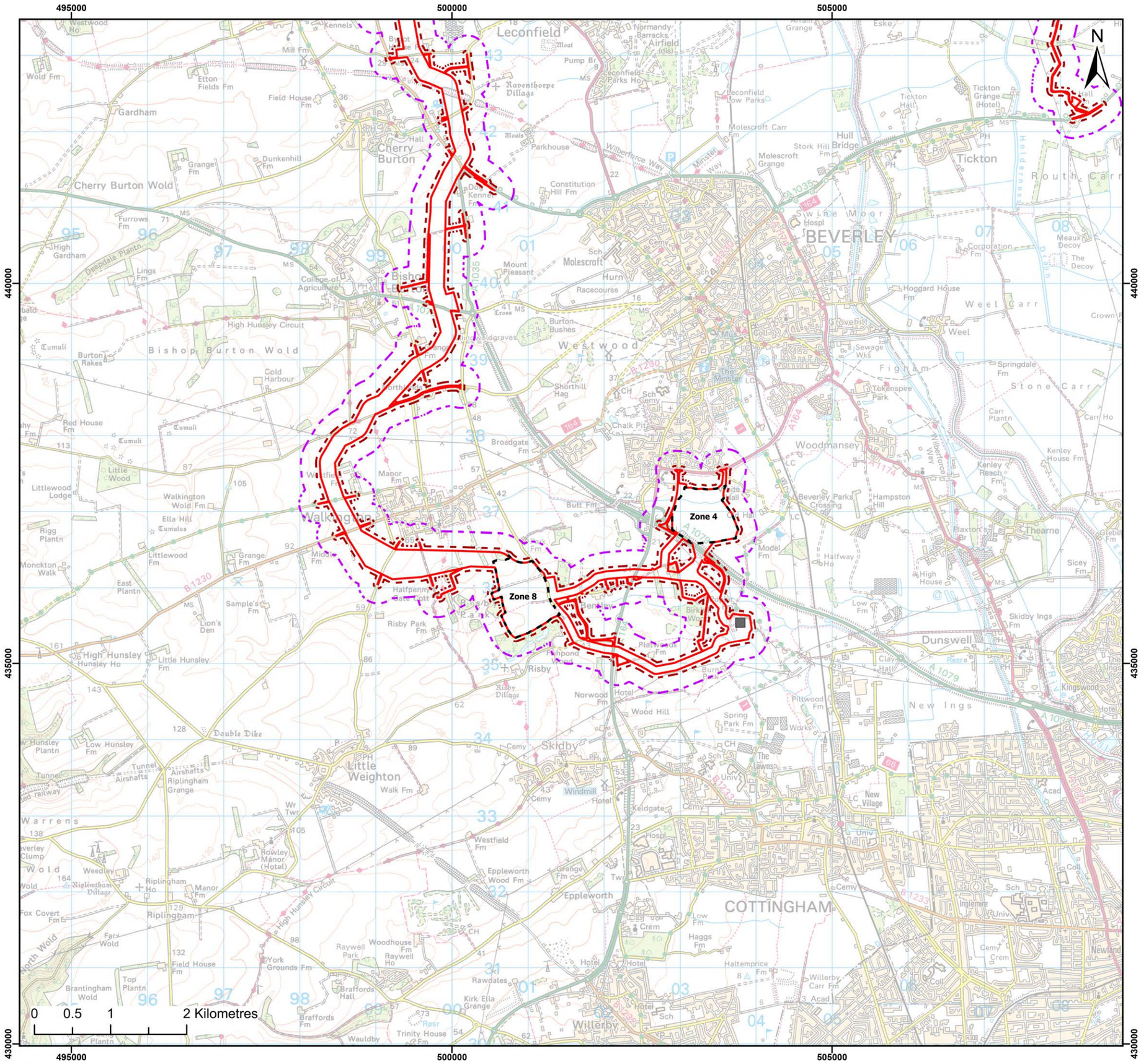

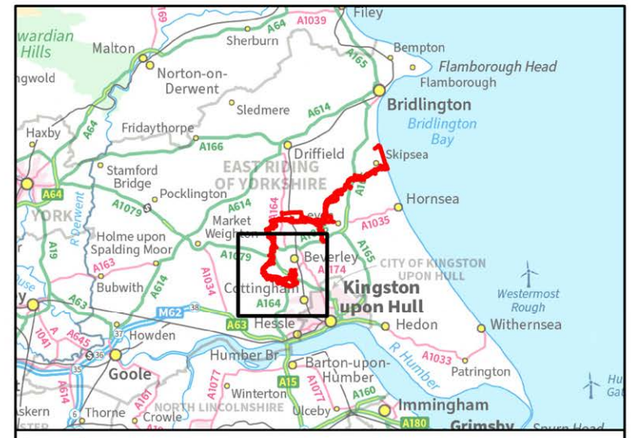

Legend:

- Onshore Development Area
- Preliminary Ecological Appraisal Study Area
- Habitat Suitability Index Study Area
- Onshore Converter Station Zone Options
- Indicative Birkhill Wood Substation Location

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Field Survey Study Area
- Sheet 3 of 3

Figure: 23-1

Drawing No: PC6250-RHD-XX-ON-DR-GS-0315

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	27/03/2025	JH	TC	A3	1:50,000
01	03/12/2024	FC	TC	A3	1:50,000

Co-ordinate system: British National Grid

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23.4.2 Scope of the Assessment

48. No impacts have been scoped out of the onshore ecology and ornithology assessment. All impacts have been scoped into the assessment, as outlined in **Table 23-4** and discussed further in **Section 23.7**.

49. The ecological receptor, hazel dormouse *Muscardinus avellanarius* has been scoped out of assessment due to the Onshore Development Area being outside of the geographic range of this species, and no re-introduction programmes having been started or completed within Yorkshire. Further details of this are provided within the PEA report **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**.

50. It should be noted that Flamborough Head SAC, which has an offshore and onshore component, is located within 10km of the Onshore Development Area. However, the onshore component of the designation, which comprises hard and soft chalk cliffs with vegetation (which are Annex I habitats 1230 vegetated sea cliffs of the Atlantic and Baltic Coasts, a qualifying features of the SAC) are located approximately 10.36km north of the Onshore Development Area. Only part of the offshore component, which comprises sublittoral reef habitats (Annex I habitat 1170 reefs, a qualifying features of the SAC) is located within 10km of the Onshore Development Area, specifically 8.6km north. As per the definition of the Study Area provided within **Section 23.4.1**, buffers which extend seaward beyond MHWS are covered within **Chapter 10 Benthic and Intertidal Ecology.** Therefore, Flamborough Head SAC is beyond the Study Area of this assessment and is not considered further within this assessment.

51. A full list of impacts scoped in for the onshore ecology and ornithology assessment is summarised in **Volume 2, Appendix 6.1 Impacts Register**. A description of how the Impacts Register should be used alongside the PEIR chapter is provided in **Volume 2, Appendix 1.2 Guide to PEIR** and **Chapter 6 Environmental Impact Assessment Methodology**.

Table 23-4 Onshore Ecology and Ornithology – Impacts Scoped into The Assessment

Impact ID	Impact and Project Activity	Rationale
Construction		
ECO-C-01	Direct and indirect impacts to designated ecological sites – construction activities, such as trenching, excavation, piling and movement of plant and equipment	Statutory and non-statutory designated sites for nature conservation will be avoided wherever possible. However, temporary potential impacts (i.e. noise, dust, lighting) arising from construction related activities may occur.
ECO-C-02	Direct impacts to habitats – construction activities, such as trenching, excavation and piling, and establishment of haul roads and temporary construction compounds resulting in temporary habitat loss, fragmentation and disturbance	Construction activities in the Onshore Development Area will result in direct, but temporary, impacts on terrestrial habitats. Impacts to important habitats will be avoided wherever possible through micro-siting. Efforts to avoid impacts will be proportionate to the importance of the relevant habitat. However, in the event avoidance is not possible, suitable mitigation measures, which may include habitat reinstatement, will be sought following construction activities. Construction will also result in permanent loss of terrestrial habitats due to the permanent footprint of the Project's onshore infrastructure.
ECO-C-03	Direct and indirect impacts on legally protected species – construction activities, such as trenching, excavation, piling and movement of plant and equipment, resulting in species disturbance and displacement	A risk exists of directly affecting protected species through increased mortality. In addition, indirect impacts may occur where the proximity of construction works may lead to a disturbance / displacement effect on protected species associated with noise, traffic, lighting, presence of workforce, etc. Species of key concern include water vole, otter, bats, badger, hazel dormice, GCN, reptiles and invertebrates.
ECO-C-04	Spread of invasive non-native species – construction activities, such as trenching, excavation, piling and movement of plant and equipment	There is the potential for invasive non-native species to be encountered, which in turn could be spread further by construction activities.
Operation and Maintenance		
ECO-O-01	Direct and indirect impacts to designated ecological sites – routine and unplanned maintenance activities, such as unscheduled excavations and presence of above-ground infrastructure during operation	Statutory and non-statutory designated sites for nature conservation will be avoided wherever possible. However, temporary potential impacts (i.e. noise, dust, lighting) arising from O&M activities may occur.

Impact ID	Impact and Project Activity	Rationale
ECO-O-02	Direct impacts to habitats – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in temporary habitat loss, fragmentation and disturbance, and presence of above-ground infrastructure during operation with potential for long-term habitat loss, fragmentation and disturbance	O&M activities may result in temporary disturbance / displacement of terrestrial habitats and species. The presence of permanent above-ground infrastructure also impacts habitats as it maintains the long-term loss of habitats.
ECO-O-03	Direct and indirect impacts on legally protected species –routine and unplanned maintenance activities, such as unscheduled excavations, resulting in species disturbance and displacement, and presence of above-ground infrastructure during operation with potential for displacement and light or noise disturbance	A risk exists of directly affecting protected species through increased mortality. In addition, indirect impacts may occur where the proximity of O&M may lead to a disturbance / displacement effect on protected species associated with noise, traffic, lighting, presence of workforce, etc. Species of key concern include water vole, otter, bats, badger, hazel dormice, GCN, reptiles and invertebrates.
ECO-O-04	Spread of invasive non-native species – routine and unplanned maintenance activities such as unscheduled excavations	There is the potential for invasive non-native species to be encountered, which in turn could be spread further by O&M activities.
Decommissioning		
ECO-D-01	Direct and indirect impacts to designated ecological sites – decommissioning activities not yet defined	Decommissioning impacts are scoped in; however, details of onshore decommissioning activities are not known at this stage. As discussed in **Section 23.7.3**, decommissioning impacts will be assessed in detail through the Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56) where relevant, which will be developed prior to the commencement of onshore decommissioning works. In this assessment, it is assumed that most decommissioning activities would be the reverse of their construction counterparts, and that their impacts would be of similar nature to, and no worse than, those identified during the construction phase.
ECO-D-02	Direct impacts to habitats – decommissioning activities not yet defined	
ECO-D-03	Direct and indirect impacts on legally protected species – decommissioning activities not yet defined	
ECO-D-04	Spread of invasive non-native species – decommissioning activities not yet defined	

23.4.3 Embedded Mitigation Measures

52. The Project has made several commitments to avoid, prevent, reduce or, if possible, offset potential adverse environmental effects through mitigation measures embedded into the evolution of the Project Design Envelope. These embedded mitigation measures include actions that will be undertaken to meet other existing legislative requirements and those considered to be standard or best practice to manage commonly occurring environmental effects.

53. The assessment of likely significant effects has therefore been undertaken on the assumption that these measures are adopted during the construction, O&M and decommissioning phases. **Table 23-5** identifies proposed embedded mitigation measures that are relevant to the onshore ecology and ornithology assessment.

54. Full details of all commitments made by the Project are provided within the Commitments Register in **Volume 2, Appendix 6.3 Commitments Register**. A description of how the Commitments Register should be used alongside the PEIR chapter is provided in **Volume 2, Appendix 1.2 Guide to PEIR** and **Chapter 6 Environmental Impact Assessment Methodology**. In addition, a list of draft outline management plans which are submitted with the PEIR for consultation is provided in **Section 1.10** of **Chapter 1 Introduction**. These documents will be further refined and submitted along with the DCO application. See **Volume 2, Appendix 1.2 Guide to PEIR** for a list of all PEIR documents.

55. The Commitments Register is provided at PEIR stage to provide stakeholders with an early opportunity to review and comment on the proposed commitments. Proposed commitments may evolve during the pre-application phase as the EIA progresses and in response to refinements to the Project Design Envelope and stakeholder feedback. The final commitments will be confirmed in the Commitments Register submitted along with the DCO application.

Table 23-5 Embedded Mitigation Measures Relevant to Onshore Ecology and Ornithology

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
CO23	At the landfall, trenchless installation techniques will be implemented and exit pits will be located beyond Mean Low Water Springs (MLWS). Installation will be at a suitable depth below the base of the cliff to avoid potential impacts to the Withow Gap Site of Special Scientific Interest (SSSI).	DCO Works DCO Requirement - Code of Construction Practice	Limits potential impacts to habitats at the landfall	ECO-C-02
CO32	Installation of cable ducts at crossings of Environment Agency Main Rivers will be undertaken using trenchless installation techniques. Installation of cable ducts at crossings of Beverley and North Holderness Internal Drainage Board (IDB) maintained drains will be undertaken using trenchless installation techniques unless agreed otherwise.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO33	At trenchless crossings of Environment Agency Main Rivers, crossing entry and exit points will be located at least 20m from the bank of the Main River or the nearest landward toe of any associated flood defence structure. At trenchless crossings of Internal Drainage Board maintained drains and where trenchless techniques are proposed for other ordinary watercourses, crossing entry and exit points will be located at least 9m from the bank of the drain or watercourse.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO35	A Watercourse Crossing Method Statement (WCMS) will be provided as part of the Code of Construction Practice (CoCP). The WCMS will be developed in accordance with the Outline CoCP and will include details of the crossing technique and construction methodology to be undertaken at each crossing and associated environmental mitigation measures. Where open cut trenching is proposed for ordinary watercourses, temporary measures to maintain the flow of water and mitigate adverse effects on the watercourse and flood risk will be implemented during construction. Where the Environment Agency's Main Rivers are to be crossed by temporary haul roads, bailey or similar clear span bridges will be used. For other watercourses, temporary culverts with an overlying haul road will be used where existing access is not available and where temporary bridges are not practicable. Temporary culverts will be adequately sized to avoid impounding flows (including appropriate climate change allowances), and the invert set below the bed level to allow bedload transport.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO36	Onshore export cables will be installed at a minimum depth of 2m (to the top of the duct / cable or otherwise) below the channel bed of watercourses, including the landward toe of any associated flood defences. The final depth at each watercourse crossing will be dependent on local geology and geomorphology risks and will take into consideration anticipated climate change-related changes in fluvial flows and erosion that may occur over time. Crossing-specific vertical clearance depth will be agreed with the relevant authorities through the Watercourse Crossing Method Statement (WCMS).	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-O-03
CO38	A Drilling Fluid Breakout Management Plan will be provided as part of the Code of Construction Practice (CoCP). The Drilling Fluid Breakout Management Plan will be developed in accordance with the Outline CoCP and will detail mitigation measures to reduce the risk of fluid breakouts during trenchless installation works and a response plan should a fluid breakout occur.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO39	A Code of Construction Practice (CoCP) will be provided in accordance with the Outline CoCP. The CoCP	DCO Requirement - Code of Construction	Limits potential impacts to ecological	ECO-C-01

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
	will enable effective planning, monitoring and management of onshore construction works to mitigate potential impacts on the environment and communities and ensure compliance with the latest relevant regulatory requirements and best practice.	Practice	receptors	ECO-C-02 ECO-C-03 ECO-C-04
CO40	A Pollution Prevention Plan (PPP) will be provided as part of the Code of Construction Practice (CoCP). The PPP will incorporate the latest relevant Environment Agency best practice guidelines for pollution prevention and detail how ground and surface waters will be protected from construction-related pollution. The PPP will include appropriate control measures for the use and storage of any fuels, oils and other chemicals during construction works.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO41	To protect groundwater bodies, the depth of excavation works will be kept as shallow as possible in line with construction and operational requirements. The target burial depth of onshore export cables will be approximately 1.2m to the top of the installed cable ducts, except where trenchless installation techniques are used or where deeper burial depth would be required due to other restrictions such as interactions with surface and buried infrastructure and landowner requirements.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO42	A hydrogeological risk assessment, informed by ground investigations, will be undertaken at each trenchless crossing location, where earthworks / excavations are within 50m (or 250m dependent upon volume abstracted) of private potable groundwater abstractions and / or where construction works have potential to interact with Source Protection Zone (SPZ) 1 or 2 areas. A hydrogeological risk assessment will also be required for earthworks / excavations within influencing distance of abstractions whereby construction works may interrupt flow pathways due to activities such as dewatering. The hydrogeological risk assessment will be undertaken in accordance with the Environment Agency's Approach to Groundwater Protection.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO46	A Soil Management Plan (SMP) will be provided as part of the Code of Construction Practice (CoCP). The SMP will be developed in accordance with the Outline CoCP and will detail the soil stripping, excavation, storage, reinstatement, cropping and aftercare measures to safeguard soil resources and drainage during the construction works. The SMP will be informed by Agricultural Land Classification (ALC) and soil condition surveys which will be undertaken post-consent and prior to construction.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO47	Made ground, topsoil and subsoil will be stored in separate stockpiles, and any suspected or confirmed contaminated soils will be appropriately separated, contained and tested before removal (if required). The stockpile area will be cordoned off, if required, with secure fencing to prevent any disturbance or contamination by other construction activities. The stockpiled material will be sealed to prevent water ingress and erosion / wash out of the material into the surrounding environment. Where the soil is to be stockpiled for more than six months, the surface of the stockpiles will be seeded with grass / clover mix or covered to minimise erosion. This will be done in accordance with the Soil Management Plan (SMP).	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03 ECO-C-04
CO55	An Air Quality Management Plan (AQMP) will be provided as part of the Code of Construction Practice (CoCP). The AQMP will be developed in accordance with the Outline CoCP and will be in line with the latest relevant available Institute of Air Quality Management (IAQM) guidance and, where appropriate and practicable and will set out site-specific mitigation and monitoring measures for dust and other air emissions during the construction works.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO56	An Onshore Decommissioning Plan will be developed prior to commencement of onshore decommissioning works based on the relevant available guidance and legislative requirements. The scope	DCO Requirement - Onshore	Limits potential impacts to ecological	ECO-D-01

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
	and methodology of onshore decommissioning works and appropriate mitigation measures will be detailed in the plan.	Decommissioning Plan	receptors	ECO-D-02 ECO-D-03 ECO-D-04
CO59	Where possible, hedgerows and trees will be retained through micro-siting and the use of trenchless installation techniques. Where hedgerows and / or trees require removal, this will be undertaken prior to topsoil removal, and removal of hedgerow sections will be kept to a minimum as required for the construction works. Protection of veteran or ancient trees and ancient woodlands will be prioritised to avoid the losses of irreplaceable habitats through micro-siting and use of trenchless installation techniques where reasonably practicable. Trees identified to be retained will be fenced off, and root protection zones established according to the latest relevant best practice. Where trees require removal, they will be replanted or replaced if replanting is not practicable. Replanting / planting of replacement trees will be undertaken in a suitable location within the Onshore Development Area but not directly over the onshore export cables. Replacement planting of sections of hedgerows and trees removed for construction works will be undertaken during reinstatement post-construction using more diverse and locally appropriate native species. The specification of mitigation / replacement planting will ensure reinstated habitats can be effectively established.	DCO Requirement - Landscape Management Plan DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-02 ECO-O-02
CO60	All onshore export cables will be buried underground for the entire length of the cable corridor. No overhead pylons will be installed as part of the consented works.	DCO Works	Limits potential impacts to ecological receptors	ECO-O-01 ECO-O-02
CO61	Jointing bays along the onshore export cable corridor and the transition joint bay (TJB) at landfall will be buried underground, with the land above reinstated, except where access will be required to underground link boxes via manhole cover at ground level and where link boxes in proximity to jointing bays are installed above-ground.	DCO Requirement - Detailed Design (Onshore)	Limits potential impacts to ecological receptors	ECO-O-01 ECO-O-02
CO63	Detailed design of infrastructure in the Onshore Converter Station (OCS) zone will be developed in accordance with the Design Vision. The Design Vision submitted as part of the application for development consent will set out design principles to ensure good design with respect to aesthetic, functionality and sustainability considerations.	DCO Requirement - Detailed Design (Onshore)	Limits potential impacts to ecological receptors	ECO-O-01
CO65	A Landscape Management Plan (LMP) will be developed in accordance with the Outline LMP. The LMP will detail: • The reinstatement strategy for areas temporarily disturbed and mitigation planting for landscape elements removed during construction. • Measures to provide screening to facilitate the integration of built infrastructure in the Onshore Converter Station (OCS) zone into the existing landscape. Landscape mitigation planting will be established as early as reasonably practicable during the construction phase. • Requirement for aftercare of mitigation and replacement planting which will be undertaken during the establishment period (five years) in which all planting will be monitored and maintained to ensure good establishment of trees, hedgerows and other planting. • Activities, timeframes and roles and responsibilities during the establishment period.	DCO Requirement - Landscape Management Plan	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
CO66	Operational lighting (with the exception of low-level, motion-sensor security lighting) at the Onshore Converter Station (OCS) zone will only operate when required for operation and maintenance (O&M) activities during low light conditions. Any operational lighting will be designed in accordance with the latest relevant guidance and legislation and to minimise light spill. Details of the location, height, design and luminance of operational lighting to be used will be provided as part of the detailed design.	DCO Requirement - Detailed Design (Onshore)	Limits potential impacts to ecological receptors	ECO-O-01 ECO-O-03
CO70	A Construction Noise and Vibration Management Plan (CNVMP) will be provided as part of the Code of Construction Practice (CoCP). The CNVMP will be developed in accordance with the Outline CoCP and will set out the relevant noise and vibration management measures, including embedded best practicable means and site-specific mitigation and monitoring measures, to be adopted during construction. Where any exceedance of noise and vibration thresholds of significance is identified during post-consent modelling or monitoring, appropriate additional mitigation measures will be identified and implemented to avoid significant construction noise and vibration effects.	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO71	The noise emissions from operation of the Onshore Converter Station (OCS) and Energy Storage and Balancing Infrastructure (ESBI) will not exceed limits at identified noise sensitive receptors, as specified in the DCO requirement. An operational noise investigation protocol will ensure that noise emissions from operation of the OCS and ESBI will not exceed limits at identified noise sensitive receptors.	DCO Requirement - Control of Operational Noise during Operational Stage	Limits potential impacts to ecological receptors	ECO-O-01 ECO-O-03
CO81	An Ecological Management Plan (EcoMP) will be developed in accordance with the Outline EcoMP. The EcoMP will set out mitigation and monitoring measures required in advance of construction commencing on-site, during construction and post-construction for habitats and relevant ecological receptors, including but not limited to, hedgerows, trees, birds, bats, badgers, otters, water voles, reptiles, great crested newts, terrestrial invertebrates and other protected and notable species where relevant. The EcoMP will also detail any long-term mitigation and management measures to ensure the establishment of reinstated hedgerows and habitats and include biosecurity measures to prevent the transfer and spread of invasive non-native species.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-01 ECO-O-01 ECO-C-02 ECO-O-02 ECO-C-03 ECO-O-03 ECO-C-04 ECO-O-04
CO82	A Biodiversity Net Gain (BNG) Strategy will be developed in accordance with the Outline BNG Strategy. Where required under emerging regulatory requirements for Nationally Significant Infrastructure Projects, the BNG Strategy will set out the approach of assessing and securing BNG for the onshore components of the Project and deliver at least 10% BNG. Based on detailed design information, the BNG Strategy will provide a finalised BNG metric calculation to assess the on-site net change in biodiversity and detail the on-site and off-site compensation proposals and how they would be legally secured, managed and monitored for a minimum of 30 years.	DCO Requirement - Biodiversity Net Gain Strategy	Limits potential impacts to ecological receptors. Measures which provide up to 10% BNG are considered mitigation. In the event over 10% BNG is delivered, this will be considered enhancement.	ECO-C-02 ECO-O-02 ECO-C-03 ECO-O-03
CO83	To avoid direct impacts to Local Wildlife Sites (LWS) from the installation of cable ducts during construction, micro-siting or trenchless installation techniques will be used where reasonably practicable. Where direct impacts cannot be avoided, bespoke mitigation will be agreed with the relevant authorities where required.	DCO Requirement - Ecological Management Plan DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-O-01
CO84	Vegetation clearance will be undertaken outside of the breeding bird season in line with the Outline Ecological Management Plan (EcoMP) where reasonably practicable. If this is not reasonably practicable,	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
	the vegetation to be removed will be subject to a Nesting Bird Check by a suitably qualified ecologist prior to the commencement of the relevant construction works. If nesting birds are present, the vegetation will not be removed until the young have fledged or the nest attempt has ended.			
CO85	Construction site lighting will only operate when required and will be positioned and directed to avoid unnecessary illumination and minimise glare to surrounding residential properties, sensitive ecological receptors, Public Rights of Way (PRoW) users and users of adjoining public highways. Details of the location, height, design and luminance of construction site lighting to be used will be provided in the Code of Construction Practice (CoCP).	DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-03
CO86	Prior to the commencement of the relevant stage of construction works, all trees within the construction area will be re-assessed for their suitability for roosting bats by a suitably qualified ecologist in line with the Outline Ecological Management Plan (EcoMP). Trees with bat roost potential will be subjected to further pre-construction survey in accordance with the latest relevant best practice guidelines. A roosting bat impact assessment that considers the combined impact on roosting, foraging, and commuting bats will then be undertaken. Where targeted surveys find no evidence of roosting bats, trees with low and PRF-M bat roost potential will be soft-felled as required for the construction works.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO87	Where required, provision will be made for badger access in construction areas, when work is not taking place in order to ensure normal movements as far as reasonably practicable in line with the Outline Ecological Management Plan (EcoMP). Provision will be made to avoid the entrapment of any animals within construction areas. Checks will be made by a suitably qualified ecologist prior to the start of any works and during construction within the construction areas to ensure no animals are trapped.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO88	Where removal of sections of hedgerows is required during construction and where determined to be required by a suitably qualified ecologist, moveable inserts / features will be deployed on a nightly basis to ensure continuation of commuting and / or foraging by bats in line with the Outline Ecological Management Plan (EcoMP). Moveable features will be of an appropriate size and density relative to the hedgerow that is removed and will be put in place at least one hour before dusk and removed no earlier than 30 minutes after dawn.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO89	A suitably qualified ecologist will undertake a search of all working areas identified as being suitable for reptiles in line with the Outline Ecological Management Plan (EcoMP). Any reptiles found within the working area will be relocated into suitable adjacent habitat. Habitat manipulation will be undertaken to discourage reptiles from the working areas, with vegetation clearance cut in two stages under an Ecological Clerk of Works (ECoW) watching brief before each cutting stage.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO90	Where works cannot be undertaken outside of breeding bird season, damage or destruction to any wild birds' nest will be avoided through Nesting Bird Checks undertaken 48 hours prior to the commencement of ground and vegetation clearance works in line with the Outline Ecological Management Plan (EcoMP). Where breeding bird activity is recorded, construction works (excluding vehicle and personnel movements) may be halted immediately until a disturbance risk assessment is undertaken by a suitably qualified ecologist. Where it is determined that breeding birds are not likely to be affected, construction works will continue. Where it is determined that breeding birds may be affected, additional mitigation works will be implemented to prevent disturbance. Where, in the opinion of the suitably qualified ecologist, disturbance to nesting birds cannot be avoided through mitigation, construction works surrounding the area will be suspended	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03

Commitment ID	Proposed Embedded Mitigation	How the Embedded Mitigation Will be Secured	Relevance to Onshore Ecology and Ornithology Assessment	Relevance to Impact ID
	until nesting is allowed to reach their natural conclusion without being disturbed or damaged.			
CO91	Disturbance to any Schedule 1 breeding wild bird under the Wildlife and Countryside Act 1981 (as amended) will be avoided through establishment of a safe buffer distance (as appropriate for the species per the latest relevant available guidance and advised by a suitably qualified ecologist) of all activities from any nesting pair that is identified.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO92	Where construction works are undertaken within or adjacent to open field, wetland or foreshore habitat between November and January, a pre-construction survey will be undertaken as required by a suitably qualified ecologist to record the distribution and abundance of overwintering waterbird flocks in line with the Outline Ecological Management Plan (EcoMP), and the distribution of suitable habitat likely to be affected during the winter season within which construction works will be undertaken. The findings of these pre-construction surveys will determine whether mitigation measures to reduce disturbance to waterbird flocks would be required. During the construction works, should over-wintering waterbirds be present, a suitably qualified ecologist will be responsible for advising on the appropriate levels of mitigation such as watching briefs and toolbox talks to site personnel.	DCO Requirement - Ecological Management Plan	Limits potential impacts to ecological receptors	ECO-C-03
CO100	All areas of land temporarily disturbed during construction in the Onshore Development Area, including any temporary construction compounds and haul roads, will be reinstated to pre-existing conditions as far as reasonably practicable. Reinstatement will commence as soon as practicable following completion of the relevant works in the area. In areas of agricultural cropland where temporary loss or disturbance is required, soils will be reinstated within no more than 24 months, wherever practicable and unless otherwise requested by the relevant landowners.	DCO Requirement - Landscape Management Plan DCO Requirement - Ecological Management Plan DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03
CO101	Reinstatement of cable trenches, haul roads and other land temporarily disturbed within the onshore export cable corridor will commence as soon as reasonably practicable following the completion of duct installation works in each section. Where access is required to be retained for cable pull-in, jointing and commissioning works, land will be reinstated following the completion of all onshore export cable construction activities.	DCO Requirement - Landscape Management Plan DCO Requirement - Ecological Management Plan DCO Requirement - Code of Construction Practice	Limits potential impacts to ecological receptors	ECO-C-01 ECO-C-02 ECO-C-03

23.4.4 Realistic Worst-Case Scenarios

56. To provide a precautionary, but robust, assessment at this stage of the Project's development process, a realistic worst-case scenario has been defined in **Table 23-6** for each impact scoped into the assessment (as outlined in **Section 23.4.2**). The realistic worst-case scenarios are derived from the range of parameters included in the Project Design Envelope. They ensure that the assessment of likely significant effects is based on the maximum potential impact on the environment. Should an alternative development scenario be taken forward in the final design of the Project, the resulting effects would not be greater in effect significance. Further details on the Project Design Envelope are provided in **Chapter 6 Environmental Impact Assessment Methodology**.

57. Following the PEIR publication, further design refinements will be made based on ongoing engineering studies and considerations of the EIA and stakeholder feedback. Therefore, realistic worst-case scenarios presented in the PEIR may be updated in the ES. The Project Design Envelope will be refined where possible to retain design flexibility only where it is needed.

23.4.5 Development Scenarios

58. Consideration is also given to the different development scenarios with respect to the OCS zones. At this stage, two OCS zone options remain in the Project Design Envelope (see **Chapter 4 Project Description** for further details) noting that only one option will be developed. The two development scenarios are:

- Infrastructure located in OCS Zone 4; or
- Infrastructure located in OCS Zone 8.

59. With respect to the onshore ecology and ornithology assessment, it is noted that the assessment of likely significant effects is not materially affected by the two development scenarios, as the same broad receptors, realistic worst-case scenarios and potential effects are applicable to both OCS zone options. However, where relevant, differences in the two OCS zone options are discussed within the baseline environment (**Section 23.6**) and further considered within the assessment of effects (**Section 23.7** and **Section 23.8**).

Table 23-6 Realistic Worst-Case Scenarios for Impacts on Onshore Ecology and Ornithology

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Construction			

ECO-C-01	Direct and indirect impacts to designated ecological sites – construction activities, such as trenching, excavation, piling and movement of plant and equipment	**Landfall**
		• Maximum horizonal length of trenchless installation: 2,000m
		• Maximum number of landfall cable ducts: 3 (including 1 spare)
		• Maximum number of Transition Joint Bay (TJB) at landfall: 1
		• Maximum number of underground link box at landfall: 1
		• Indicative temporary landfall construction compound area: 12,500m^2 (including construction footprint of TJB and underground link box)
		• Indicative minimum depth of trenchless installation at cliff: 5m
		• Indicative haul road width at landfall: 7m
		• Maximum TJB and underground link box burial depth: 3m
		• Anticipated duration of landfall construction works: approximately three years (including one year of trenchless installation works)
		Onshore ECC
		• Indicative temporary construction corridor width:
		  ○ HVDC: 32m (50m at trenchless crossing locations)
		  ○ HVAC: 55m (60m at trenchless crossing locations)
		• Indicative haul road width within temporary construction corridor: 6m (8.5m where passing places are required)
		• Maximum length of onshore ECC:
		  ○ HVDC: 50km (from landfall to OCS zone)
		  ○ HVAC: 5km (from OCS zone to Birkhill Wood Substation)
		• Maximum number of trenches for onshore export cables:
		  ○ HVDC: 2
		  ○ HVAC: 4
		• Target minimum cable burial depth using open cut trenching: 1.2m
		• Target maximum cable burial depth using trenchless installation techniques: 20m
		• Maximum land area temporarily disturbed during construction: 1,700,000m^2
		• Indicative number of jointing bay locations: 62
		• Indicative number of link box locations along onshore ECC: 56 (for the purposes of the PEIR assessment, it is assumed that at approximately 20 link box locations for the HVDC export cables and all link box locations for the
			These parameters represent the maximum footprint and duration of disturbance of construction works within the Onshore Development Area.
			Duration includes site preparation works, temporary construction compounds, accesses and haul roads establishment, trenchless installation works, open cut trenching for cable duct installation, cable pull-in and jointing operations, construction of jointing bays, the TJB and associated link boxes, OCS and ESBI construction and reinstatement works.

ECO-C-02	Direct impacts to habitats – construction activities, such as trenching, excavation and piling, and establishment of haul roads and temporary construction compounds resulting in temporary habitat loss, fragmentation and disturbance		
ECO-C-03	Direct and indirect impacts on legally protected species – construction activities, such as trenching, excavation, piling and movement of plant and equipment, resulting in species disturbance and displacement		

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale

ECO-C-04	Spread of invasive non-native species – construction activities, such as trenching, excavation, piling and movement of plant and equipment	HVAC export cables will involve the use of above-ground link boxes)
		• Maximum jointing bay and link box temporary construction area per location:
		  ○ HVDC: 660m^2
		  ○ HVAC: 1,040m^2
		• Maximum jointing bay burial depth: 2.5m
		• Maximum underground link box burial depth / above-ground link box height: 2m
		• Indicative main temporary construction compound area per compound: 20,000m^2
		• Indicative intermediate temporary construction compound area per compound: 5,625m^2
		• Indicative trenchless installation compound area per compound
		  ○ HVDC: 300m^2 (5,625 for non-HDD techniques)
		  ○ HVAC: 800m^2 (5,625 for non-HDD techniques)
		• Indicative number of main construction compounds for onshore export cable works: 4
		• Indicative number of intermediate construction compounds for onshore export cable works: 8
		• Indicative number of trenchless crossing locations: 70
		• Trenchless installation techniques for major obstacle crossings considered include Horizontal Directional Drilling (HDD), auger boring, micro-tunnelling, pipe jacking / ramming and Direct Pipe
		• Anticipated duration of onshore export cable construction works: approximately four years
		OCS Zone (OCS and ESBI)
		• Indicative access road width: 7.3m (including site access road from public highway and internal tracks within the site)
		• Maximum developable area for OCS and ESBI: 25ha (including but not limited to, the platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement)
		• Total temporary area: 4.5ha (including 2 temporary construction compounds for the OCS and ESBI)
		• Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement
		• Indicative quantity of topsoil excavated within OCS zone: 100,000m^3 (assumed 50% of topsoil to be removed off-site – 50,000m^3)
		• Anticipated duration of OCS and ESBI construction works: approximately five years	

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Operation and Maintenance			

ECO-O-01	Direct and indirect impacts to designated ecological sites – routine and unplanned maintenance activities, such as unscheduled excavations and presence of above-ground infrastructure during operation	Anticipated duration of O&M phase: approximately 35 years
		Landfall
		• Maximum number of TJB at landfall: 1
		• Maximum number of underground link box at landfall: 1
		• Maximum permanent TJB area: 30m^2
		• Maximum permanent underground link box area: 10m^2
		• Maximum TJB and underground link box burial depth: 3m
		Onshore ECC
		• Indicative width of operational easement for HVDC export cables: 20m
		• Indicative width of operational easement for HVAC export cables: 25m
		• Maximum length of onshore ECC:
		  ○ HVDC: 50km (from landfall to OCS zone)
		  ○ HVAC: 5km (from OCS zone to Birkhill Wood Substation)
		• Indicative number of jointing bay locations: 62
		• Indicative number of link box locations along onshore ECC: 56 (for the purposes of the PEIR assessment, it is assumed that at approximately 20 link box locations for the HVDC export cables and all link box locations for the HVAC export cables will involve the use of above-ground link boxes)
		• Maximum jointing bay burial depth: 2.5m
		• Maximum underground link box burial depth / above-ground link box height: 2m
		• Maximum permanent jointing bay area: 30m^2 (per jointing bay)
		• Maximum permanent underground link box area: 4m^2 (per link box)
		• Maximum permanent above-ground link box area: 3m^2 (per link box)
		• Underground link boxes will be installed with a manhole cover for O&M access at ground level. Above-ground link boxes will be installed as kiosks on concrete pads. Link boxes are typically marked / protected by bollards, fences or similar of approximately 1.2m to 2m in height (where required and agreed with the relevant landowners).
		• Small marker posts of approximately 1m to 1.2m height will be installed along the operational easement to demark the location of the installed onshore export cables. Marker posts will, at a minimum, be required at field boundaries, on either side of obstacle crossings such as roads and watercourses and where there are significant directional changes in the cable route.
		OCS Zone (OCS and ESBI)
		• Maximum developable area for OCS and ESBI: 25ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement).
		• Total permanent area: 20.5ha (including but not limited to platform footprint, landscaping, access, drainage and attenuation but exclude areas for ecological mitigation / enhancement).
			These parameters represent the maximum footprint of the Project that would interact with the baseline environment during operation.

ECO-O-02	Direct impacts to habitats – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in temporary habitat loss, fragmentation and disturbance, and presence of above-ground infrastructure during operation with potential for long-term habitat loss, fragmentation and disturbance		
ECO-O-03	Direct and indirect impacts on legally protected species –routine and unplanned maintenance activities, such as unscheduled excavations, resulting in species disturbance and displacement, and presence of above-ground infrastructure during operation with potential for displacement and light or noise disturbance		
ECO-O-04	Spread of invasive non-native species – routine and unplanned maintenance activities such as unscheduled excavations		

Impact ID	Impact and Project Activity	Realistic Worst-Case Scenario	Rationale
Decommissioning			
ECO-D-01	Direct and indirect impacts to designated ecological sites – decommissioning activities not yet defined	The final decommissioning strategy of the Project's onshore infrastructure has not yet been decided. For a description of potential onshore decommissioning works, refer to **Chapter 4 Project Description**. It is recognised that regulatory requirements and industry best practice change over time. Therefore, the details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning. Specific arrangements will be detailed in an Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56), which will be submitted and agreed with the relevant authorities prior to the commencement of onshore decommissioning works. For this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.	
ECO-D-02	Direct impacts to habitats – decommissioning activities not yet defined		
ECO-D-03	Direct and indirect impacts on legally protected species – decommissioning activities not yet defined		
ECO-D-04	Spread of invasive non-native species – decommissioning activities not yet defined		

23.5 Assessment Methodology

23.5.1 Guidance Documents

60. The following guidance documents have been used to inform the baseline characterisation, assessment methodology and mitigation design for onshore ecology and ornithology:

- British Standard 5837: 2012 – Trees in relation to design, demolition and construction;
- Bat Conservation Trust and Institute of Lighting Engineers (2018) Bats and Artificial Lighting in the UK (ILE, 2018);
- The Water Vole Mitigation Handbook (The Mammal Society Guidance Series) (Dean *et al.*, 2016);
- Reptile Habitat Management Handbook (Edgar *et al.*, 2010);
- Great Crested Newt Mitigation Guidelines (English Nature, 2001);
- Herpetofauna Worker's Manual (JNCC, 2003);
- Otters: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022a);
- Badgers: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022b);
- Bats (all species): advice for making planning decisions. Natural England Standing Advice (Natural England, 2022c);
- Bat surveys for professional ecologists good practice guidelines (Bat Conservation Trust, 2023);
- Great crested newts: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022d);
- Great crested newt habitat suitability index (HSI), ARG UK advice note 5 (Amphibian and Reptile Groups of the United Kingdom, 2010);
- Invertebrates: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022e);
- Reptiles: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022f);
- Water voles: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022g);
- Water Vole Conservation Handbook, 3rd Edition (Strachan and Moorhouse, 2011);
- Great Britain (GB) Non-native Species Information (GB Non-native secretariat, 2015);
- Protected plants, fungi and lichens: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022h); and
- Ancient woodland, ancient trees and veteran trees: advice for making planning decisions. Natural England Standing Advice (Natural England, 2022i).

23.5.2 Data and Information Sources

23.5.2.1 Desk Study

61. A desk study has been undertaken to compile baseline information in the previously defined Study Area(s) (see **Section 23.4.1**) using the sources of information set out in **Table 23-7**.

Table 23-7 Desk-Based Sources for Onshore Ecology and Ornithology Data

Data Source	Spatial Coverage	Year(s)	Summary of Data Contents
North and East Yorkshire Ecological Data Centre (NEYEDC)	Onshore Development Area +2km buffer	2024	All species records, local and non-statutory sites data, habitat data, and statutory site data.
ESRI	Onshore Development Area	2022	Satellite imagery of habitats present, to provide an initial impression of habitats within the Onshore Development Area.
Yorkshire Wildlife Trust (https: / / www.ywt.org.uk /)	Non-statutory sites within the Onshore Development Area	2024	Information on Yorkshire Wildlife Trust Sites.
Dogger Bank South Environmental Statement (ES) Ch 18 and Appendices (RWE Renewables 2025)	Dogger Bank South Onshore DCO Limits	2022-23	Overwintering bird survey transect counts, summaries and maps that are relevant to the Onshore Development Area.
eBird (Cornell Lab of Ornithology)	East Riding of Yorkshire	2019-24	All bird species occurrence and count data submitted to eBird from birding visits to eBird 'Hotspots' and eBird users' personal locations in the county.
Ancient Woodland Inventory (Natural England)	Onshore Development Area +2km buffer	2024	A spatial inventory of over 52,000 areas of ancient woodland within England.

Data Source	Spatial Coverage	Year(s)	Summary of Data Contents
Environment Agency, freshwater fish surveys	Onshore Development Area	2024	Fish and eel records.

23.5.2.1.1 Onshore Ornithology

62. Desk-based data and preliminary data from site-specific surveys (up to December 2024) has been used to inform the baseline for onshore ornithology within this chapter. The approach to the onshore ornithology baseline desk study was developed based on the specifications for desk study provided by Natural England through the DAS and agreed with stakeholders at the second meeting of ETG6 (2nd October 2024) including the ERYC ecologist. The desk study included:

- A data search from NEYEDC (the local ecological data centre), eBird Basic Dataset (2024) and BTO Birdtrack (as detailed below);
- Accessing relevant Dogger Bank South onshore ornithology survey data (as detailed below); and
- Research of reports by local bird groups (Yorkshire Naturalists Union, Merebirders, blog reporting Hornsea Mere bird records).

63. Appropriate sources for desk-based data were identified during an initial review wherein data held by biodiversity record centres and citizen science surveys and platforms, and data collected for other infrastructure project applications in the locality, were assessed to prioritise data collected since 2019 (i.e., within five years preceding the desk study), in the same locality and habitat types, via a standardised or structured method.

64. Bird data from within 2km of the Onshore Development Area was requested as part of a protected species data request from NEYEDC. Bird observations data from the East Riding of Yorkshire for the period 2019-2024 was requested from eBird Basic Dataset (2024), and records relating to the Onshore Development Area were retrieved from this wider data return by geographically extracting all observations located within 2km of the Onshore Development Area and over 500m from the MLWS (all records within 500m of the MLWS are included in assessment in **Chapter 13 Offshore and Intertidal Ornithology**). Transect survey data collected for Dogger Bank South Offshore Wind Farms partially overlaps with the Onshore Development Area. Relevant data from the Dogger Bank South ES Appendices (Peak Ecology 2023, 2024) was therefore reviewed. Peak counts per survey transect 1-8 (excluding intertidal and offshore sightings) were summed to provide an estimated Dogger Bank South survey area population estimate to indicate order of magnitude population sizes associated with the Onshore Ornithology Desk Study Area for this assessment. Across data sources, there was varying ability to identify species recorded flying over only the area rather than utilising its terrestrial habitats. Species recorded as flying over only, are identified where possible, but are otherwise considered in assessment equally to species confirmed to be present in site habitats, on a precautionary basis.

65. To determine a specific overwintering and passage bird baseline data for OCS Zone 4, Dogger Bank South overwintering bird survey maps from 2022-23 (Peak Ecology 2023, 2024) were consulted. Birds recorded within Dogger Bank South's transect 7 and 8 maps, whose location was within the Project's OCS Zone 4 boundary, plus a 250m buffer area, were identified, and their numbers summed across the two transect visits per month (e.g. 55 black-headed gull recorded during the transect 7 visit in November 2022 plus 6 recorded during the November 2022 transect 8 visit, totals 61 black-headed gull).

66. While this is a relatively coarse approach to collating the data from the two transects (typically visited on separate days of each survey month), the two transects have overlapping routes and viewsheds, therefore, wintering species which are mobile between parts of the site between days are more likely to be detected and counted (or double-counted), than fail to be detected or their abundance underestimated.

67. To determine a specific overwintering and passage bird baseline for OCS Zone 8, BTO Birdtrack data was accessed for the Risby Estate which has been subject to volunteer survey effort since 2018 with more sporadic historical effort between 1989 and 2017. This was supplemented by NEYEDC data from the Risby Estate.

23.5.2.2 Site-Specific Surveys

68. In addition to desk-based sources, site-specific surveys were undertaken to provide detailed baseline information on onshore ecology and ornithology. **Table 23-8** summarises surveys that have been completed to inform the PEIR or are planned to be undertaken to inform the ES.

69. Site-specific ornithology surveys from August to December 2024 provided preliminary data to inform the PEIR alongside the ornithology desk data described in **Section 23.5.2.1.1**. Visit information including survey type, date and timing relative to tide state are shown in

70. **Table** 23-9.

Table 23-8 Site-Specific Survey Data for Onshore Ecology and Ornithology

Survey	Spatial Coverage	Year(s)	Summary of Survey Data
Completed Surveys			
PEA Surveys	Approximately 70% of Onshore Development Area +50m buffer	2024	The PEA surveys included mapping of baseline habitats present using Version 2 of the UKHab Habitat Classification methodology (UKHab, 2023). In addition, Habitat Condition Assessment (Defra, 2024b) and identification of signs of, or potential for, protected and notable species to be present have been recorded **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**. The PEA surveys did not include an exhaustive presence or absence survey for any protected or notable species. The 2024 PEA surveys covered approximately 70% of the Onshore Development Area and a 50m buffer around this area. The approximate 30% area of land not covered was due to access limitations at the time of survey. Where possible, land not covered during the 2024 PEA surveys will be surveyed in 2025 to inform the ES.
Onshore Overwintering and Passage Birds Surveys	Onshore Development Area	2024-2025 (ongoing)	Transect coverage of full Onshore Development Area once monthly. Additional monthly transect covering Onshore Development Area within 10km of the Humber Estuary SPA. Vantage point coverage of OCS zones once monthly. Vantage point coverage of Onshore Development Area within 10km of the Humber Estuary SPA twice monthly plus nocturnal vantage points twice monthly. This methodology was developed based on Natural England advice through the DAS, and agreed with stakeholders at the second meeting of ETG6. Only data up to December 2024 has been used to inform the PEIR. Additional data between January and mid-May 2025 will be presented in the ES.
GCN HSI Surveys	Onshore Development Area + 250m buffer	2024	The HSI surveys include an assessment of the quality of habitat to support GCN. HSI surveys assess the quality of habitat based on various factors including pond size, water quality and surrounding terrestrial habitat, **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**. Habitats not assessed during the initial 2024 HSI surveys will be surveyed during 2025 to inform the ES.
Planned Surveys (to be completed in 2025)			
PEA Surveys	Onshore Development Area	April-September 2025	This survey will consist of habitat surveying of approximately 30% of the Onshore Development Area that was not accessible during the 2024 PEA surveys (where possible). The scope and survey area of all other surveys planned for 2025 are anticipated to include relevant habitats which are identified though the PEA surveys undertaken between 2024 and 2025.
GCN HSI Surveys	Onshore Development Area +250m buffer	Mid-April to June 2025	This survey will consist of HSI surveys of approximately 56 waterbodies (ponds and watercourses) within a 250m buffer of the Onshore Development Area that were not accessible during the initial 2024 HSI surveys.
Onshore Overwintering and Passage Birds Surveys	Onshore Development Area	January to Mid-May 2025	As set out above, data between January to mid-May 2025 to be presented in the ES.

Survey	Spatial Coverage	Year(s)	Summary of Survey Data
GCN Presence / Absence Surveys	Onshore Development Area +250m buffer	Mid-April to June 2025	Environmental DNA (eDNA) surveys of the 42 suitable ponds identified within 250m of the Onshore Development Area to determine the presence or likely absence of GCN. Suitable ponds include all standing water bodies with HSI scores between 'poor' and 'excellent'. Unsuitable standing water or ponds are those which are identified as unsuitable for GCN due to being dry at the time of survey, subject to significant pollution, contain artificial banks, or are brackish.
Badger Surveys	Onshore Development Area	February to April, and September to November 2025	Badger setts and field signs have been identified through the 2024 PEA surveys. Further badger surveys will be required to assess the presence or likely absence of badger setts, the type of setts and any other notable types of badger related activity. Surveys will cover the Onshore Development Area and any land within 30m of construction works.
Bat Activity Walkover Surveys (Foraging and Commuting)	Onshore Development Area	April to October 2025	These surveys will consist of night-time bat walkover surveys of all suitable commuting and foraging habitats that may be impacted by the Project. This will involve one visit per season per route (spring – April / May, summer – June / July / August, and autumn – September / October) for all suitability habitats. Further surveys may be required if these visits, or the results of static detector surveys, reveal activity of interest that requires further observation.
Bat Activity Static Surveys (Foraging and Commuting)	Onshore Development Area	April to October 2025	Static bat detector monitoring will also be used. For low suitability habitats, data will be collected for a minimum of five consecutive nights per season (spring – April / May, summer – June / July / August, and autumn – September / October) in appropriate weather conditions for bats. For moderate and high suitability habitats, data will be collected for a minimum of five consecutive nights per month (April – October) in appropriate weather conditions for bats.
Ground Level Tree Assessments (GLTA)	Onshore Development Area	Any time of year, 2025	The GLTA surveys will cover all trees that may be directly or indirectly impacted by the Project to assess for potential roost feature - individual (PRF-I) or potential roost feature maternity (PRF-M) within the trees and any further survey recommendations such as aerial tree inspections.

Survey	Spatial Coverage	Year(s)	Summary of Survey Data
Bat Potential Roost Feature (PRF) Aerial Inspections (Roosting) in Tree	Onshore Development Area	May to September 2025	Survey effort will depend on the GLTA results. Aerial inspections will be completed where PRF-M trees may be impacted (i.e. removed or very close to works) by the Project to assess for presence or likely absence of bat roosts. PRF-I trees require no further survey. PRF-M trees require three visits between May and September, with at least two between May and August. If a roost is identified, less invasive methods, such as emergence surveys, should be used if more information is required.
Bat Emergence / Re-Entry Surveys (Roosting) in Trees	Onshore Development Area	May to September 2025	Bat emergence / re-entry surveys are not recommended for presence / likely absence of bats in trees. They will only be used where close inspection of features is not possible and will be carried out using Night Vision Aids (NVA). Survey effort will depend on the GLTA results.
Bat Emergence / Re-Entry Surveys (Roosting) in Structures	Onshore Development Area	May to September 2025	Bat emergence / re-entry surveys will be completed on all structures suitable for supporting roosting bats that may be impacted (i.e. removed, or very close to works) by the Project to assess for presence or likely absence of bat roosts.
Water Vole Surveys	All linked aquatic habitats that intersect the Onshore Development Area	April to September 2025	The water vole surveys will cover all suitable aquatic habitats that may be impacted by the Project to assess for the presence or likely absence of water voles.
Otter Surveys	All linked aquatic habitats that intersect the Onshore Development Area	2025	The otter surveys will cover all suitable aquatic habitats that may be impacted by the Project to assess for the presence or likely absence of otters.
Breeding Bird Surveys	Onshore Development Area	Late March to early July 2025	This survey will cover all suitable habitats that may be impacted by the Project and / or afforded protection for notable breeding birds (e.g. those listed on BoCC5, Schedule 1 of the WCA, and Annex 1).

Survey	Spatial Coverage	Year(s)	Summary of Survey Data
Botanical Surveys (such as National Vegetation Classification (NVC))	Leven Canal SSSI and Greater Wash SPA	2025	Leven Canal SSSI and the Greater Wash SPA intersects and is adjacent to the Onshore Development Area respectively. The remaining international sites could be indirectly impacted by the Project. As such botanical surveys are required for these designated areas.
River Condition Assessment (RCA)	All watercourses that require RCA which intersect the Onshore Development Area	May to September 2025	These surveys will cover all watercourses that require an RCA.

Table 23-9 Visit Information for Onshore Overwintering and Passage Bird Surveys August to December 2024

Component	Date	Start	End	Humber Bridge High Tide Time	Temperature (°C)	Wind (Beaufort)	Additional Weather Information
Humber Estuary 10km Buffer + OCS Zone Transect	13/08/2024	1030 BST	1430 BST	1238 BST	20	BF 1	Rain 0, cloud cover (cc) 20%
Humber Estuary 10km Buffer Transect	21/08/2024	0607 BST	1007 BST	0847 BST	15	BF 4	Rain 0, cc 50%
Humber Estuary 10km Buffer Transect	10/09/2024	0915 BST	1315 BST	1115 BST	13	WSW 2/8 > W2/8	2 hrs heavy showers, 2 hours fine cc 100%
Humber Estuary 10km Buffer + OCS Zone Transect	24/09/2024	0926 BST	1326 BST	1126 BST	15	BF2, W	Rain 0, 100 cc, visibility 3.
Humber Estuary 10km Buffer + OCS Zone Transect	09/10/2024	0850 BST	1240 BST	1050 BST	12	BF2, N	Drizzle - none, 100 cc, visibility good - very good.
Humber Estuary 10 km Buffer Transect	23/10/2024	0911 BST	1311 BST	1111 BST	9	BF2	Dry, 100 cc. Misty 1 km.
Humber Estuary 10km Buffer + OCS Zone Transect	07/11/2024	0730 GMT	1130 GMT	0936 GMT	9	BF2,	Dry, 100 cc, low cloud / misty.
Humber Estuary 10km Buffer Transect	22/11/2024	Visit data to be confirmed.					
Humber Estuary 10km Buffer + OCS Zone Transect	06/12/2024	0800 GMT	1200 GMT	0930 GMT	6	BF3, W-NW	Dry, 30 cc, visibility 3.
Humber Estuary 10km Buffer Transect	10/12/2024	1145 GMT	1545 GMT	1345 GMT	6	BF3	Dry, 100 cc, visibility 3.
Humber Estuary 10km Buffer Vantage Point (VP) 1, 2, 3	12/08/2024	1030 BST	1330 BST	1149 BST	28	BF 1	Rain 1, cc 75%
Humber Estuary 10km Buffer VP 1, 2, 3	19/08/2024	1654 BST	2050 BST	1924 BST	18	BF 4	CC 80-90%, RAIN 0
Humber Estuary 10km Buffer VP 1, 2, 3	09/09/2024	0835 BST	1225 BST	1035 BST	14	BF 4	1 light shower, cc 8/8, visibility 3
Humber Estuary 10km Buffer VP 1, 2, 3	23/09/2024	0837 BST	1238 BST	1037 BST	15	BF3, NE	Rain 0, 100 cc, visibility 2.
Humber Estuary 10km Buffer VP 1, 2, 3	08/10/2024	0809 BST	1128 BST	1009 BST	14	BF1, NE	Drizzle, 80-90% cc, visibility very good

Component	Date	Start	End	Humber Bridge High Tide Time	Temperature (°C)	Wind (Beaufort)	Additional Weather Information
Humber Estuary 10km Buffer VP 1, 2, 3	22/10/2024	0815 BST	1200 BST	1019 BST	10	BF3, SW	Dry, 10cc, visibility very good.
Humber Estuary 10km Buffer VP 1, 2, 3	05/11/2024	0610 GMT	1050 GMT	0814 GMT	8	BF1, WNW	Dry, 100 cc, visibility 5 km.
Humber Estuary 10km Buffer VP 1, 2, 3	21/11/2024	0815 GMT	1226 GMT	0957 GMT	1	BF2-3	Dry, 0 cc, visibility good.
Humber Estuary 10km Buffer VP 1, 2, 3	05/12/2024	0755 GMT	1200 GMT	0844 GMT	11	BF3, SW	Dry, 60-70 cc, visibility 3.
Humber Estuary 10km Buffer VP 1, 2, 3	09/12/2024	1130 GMT	1500 GMT	1234 GMT	7	BF4, N	2/5 light showers, 90 cc, visibility good.
Humber Estuary 10km Buffer Nocturnal VP 1-2	13/08/2024	2311 BST	0220 BST	0118 BST	18	BF 1	rain 1, cc 80%
Humber Estuary 10km Buffer Nocturnal VP 1-2	20/08/2024	2119 BST	0030 BST	2007 BST	13	BF 4	rain 0, cc 10-80%
Humber Estuary 10km Buffer Nocturnal VP 1-3	10/09/2024	2141 BST	0100 BST	2341 BST	10	BF 3	Rain 0, cc 10%, visibility 3
Humber Estuary 10km Buffer Nocturnal VP 1-3	24/09/2024	2136 BST	0110 BST	2343 BST	10	BF3, WSW	Rain 0-1, 40-90 cc, visibility 2.
Humber Estuary 10km Buffer Nocturnal VP 1-3	08/10/2024	2027 BST	0015 BST	2227 BST	13	BF1-3, N	Light drizzle, 90-100 cc, visibility moderate - good.
Humber Estuary 10km Buffer Nocturnal VP 1-3	22/10/2024	2030 BST	0024 BST	2229 BST	8	BF1	Dry, 70 cc.
Humber Estuary 10km Buffer Nocturnal VP 1-3	05/11/2024	1829 GMT	2229 GMT	2029 GMT	5	BF1, NE	Dry, 0 cc, visibility good.
Humber Estuary 10km Buffer Nocturnal VP 1-3	21/11/2024	2025 GMT	0008 GMT	2150 GMT	1	BF2-3	Dry, 0 cc, visibility good.
Humber Estuary 10km Buffer Nocturnal VP 1-3	05/12/2024	1850 GMT	2220 GMT	2050 GMT	7	BF5, W	Dry - several short showers, 40-50 cc, visibility 3.
Humber Estuary 10km Buffer Nocturnal VP 1-3	10/12/2024	2041 GMT	0041 GMT	0146 GMT	6	BF3	Dry, 60-80 cc, visibility moderate.
OCS Zone VP 1, 2, 3	14/08/2024	1140 BST	1540 BST	1340 BST	20	BF1, NE	Dry, 50-70cc.
OCS Zone VP 1, 3	26/09/2024	1216 BST	1540 BST	1416 BST	14	8/8 SW BF	Drizzle and rain, visibility <2 km
OCS Zone VP 1, 3, 4	08/10/2024	0809 BST	1220 BST	1009 BST	15	BF2, S-SW	Rain 0, 90 cc, visibility 3.
OCS Zone VP 1, 3, 4	06/11/2024	0740 GMT	1110 GMT	0852 GMT	8	BF1, SW	Dry, 100 cc, visibility 3 km.
OCS Zone VP 1, 3	11/12/2024	1320 GMT	1530 GMT	1449 GMT	6	BF3, NNE	Dry, 100 cc, visibility good.

Component	Date	Start	End	Humber Bridge High Tide Time	Temperature (°C)	Wind (Beaufort)	Additional Weather Information
Remainder: Transect 1	15/08/2024	1308 BST	1708 BST	1508 BST	20	SSW 5	Cc 8/8 Occasional shower
Remainder: Transect 1	25/09/2024	1031 BST	1431 BST	1231 BST	13	3/8 SW2	Sunny, good visibility
Remainder: Transect 1	10/10/2024	0753 BST	1153 BST	1141 BST	9	BF4-5, N-NW	Light showers, 90 cc.
Remainder: Transect 1	08/11/2024	0650 GMT	1040 GMT	1030 GMT	9	BF2, SE	Dry, 100 cc, excellent visibility.
Remainder: Transect 1	10/12/2024	0950 GMT	1350 GMT	1345 GMT	7	BF3, NE	Dry, 90 cc, visibility 3.
Remainder: Transect 2	12/08/2024	0949 BST	1349 BST	1149 BST	30	BF1	Hot and Humid, Occasional downpour
Remainder: Transect 2	25/09/2024	1031 BST	1431 BST	1231 BST	14	East	Generally dry and mild
Remainder: Transect 2	11/10/2024	0913 BST	1313 BST	1250 BST	10	BF3, W/SW	Rain 0, 20cc.
Remainder: Transect 2	07/11/2024	0650 GMT	1040 GMT	0936 GMT	11	BF1, SSE	Dry, 100 cc, excellent visibility.
Remainder: Transect 2	11/12/2024	1056 GMT	1456 GMT	1449 GMT	7	BF2, NE	Dry, 100 cc, visibility 3.
Remainder: Transect 3	12/08/2024	0949 BST	1349 BST	1149 BST	28	SW4, 2/8->6/8	Occasional light shower
Remainder: Transect 3	24/09/2024	0925 BST	1413 BST	1126 BST	14	8/8 easterly	Started dry with a brief period of rain.
Remainder: Transect 3	11/10/2024	0913 BST	1313 BST	1250 BST	14	BF2, WSW	No rain, 0 cc, excellent visibility.
Remainder: Transect 3	07/11/2024	0630 GMT	1030 GMT	0936 GMT	10	BF2, S	Dry, 100 cc, visibility 3.
Remainder: Transect 3	11/12/2024	1056 GMT	1456 GMT	1449 GMT	7	BF1, NE	Dry, 100 cc, excellent visibility.
Remainder: Transect 4	13/08/2024	1038 BST	1438 BST	1238 BST	26	BF3, SW	Dry, 10-50 cc.
Remainder: Transect 4	24/09/2024	0926 BST	1326 BST	1126 BST	14	8/8 NW2	Good visibility, some light showers.
Remainder: Transect 4	09/10/2024	0850 BST	1250 BST	1050 BST	15	BF2, N	Rain 0, 60 cc, visibility excellent
Remainder: Transect 4	04/11/2024	0639 GMT	1039 GMT	0739 GMT	9	BF 1-2, SE	Dry, 100 cc, visibility 3.
Remainder: Transect 4	10/12/2024	1145 GMT	1545 GMT	1345 GMT	7	BF3, NE	Dry, 90-100 cc, excellent visibility.
Remainder: Transect 5	14/08/2024	1140 BST	1540 BST	1340 BST	20	BF1, NE	Dry, 50-70 cc.
Remainder: Transect 5	23/09/2024	0837 BST	1237 BST	1037 BST	13	8/8 slight westerly	Dry.
Remainder: Transect 5	09/10/2024	0850 BST	1250 BST	1050 BST	13	BF 2-3, N-NE	Light drizzle in last hour, cc 100.
Remainder: Transect 5	05/11/2024	0614 GMT	1014 GMT	0814 GMT	9	BF1, S/SE	Dry, 100 cc, visibility 3.
Remainder: Transect 5	09/12/2024	1035 GMT	1435 GMT	1234 GMT	7	BF4, NE	Rain - occasional showers, 100 cc, visibility 3.
Remainder: Transect 6	15/08/2024	1308 BST	1708 BST	1508 BST	20	SW4 8/8	Occasional showers

Component	Date	Start	End	Humber Bridge High Tide Time	Temperature (°C)	Wind (Beaufort)	Additional Weather Information
Remainder: Transect 6	23/09/2024	0837 BST	1237 BST	1037 BST	13	8/8 NE2	Dry but murky, visibility 2 km
Remainder: Transect 6	08/10/2024	0809 BST	1209 BST	1009 BST	17	BF1	Heavy showers or drizzle, 70-100 cc, visibility initially 1.2 km then improving.
Remainder: Transect 6	06/11/2024	0652 GMT	1052 GMT	0852 GMT	11	BF2, SW	Dry, 100 cc, visibility 3.
Remainder: Transect 6	09/12/2024	1034 GMT	1434 GMT	1234 GMT	7	BF3, NE	Few light showers, 50-100 cc, visibility good.

23.5.3 Impact Assessment Methodology

71. **Chapter 6 Environmental Impact Assessment Methodology** sets out the overarching approach to the impact assessment methodology. The topic-specific methodology for the onshore ecology and ornithology assessment is described further in this section.

72. The EcIA methodology proposed in relation to onshore ecology and ornithology is based on the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018). These guidelines aim to predict the residual impacts on important ecological features affected, either directly or indirectly by a development, once all the appropriate mitigation has been implemented.

23.5.3.1 Impact Assessment Criteria

73. Onshore ecological and ornithological receptors which are sensitive to the identified impacts are systematically assessed for impact pathways and magnitude of effect. The definitions of sensitivity, importance and magnitude are provided in **Table 23-10, Table 23-11**, and **Table 23-12.**

74. In addition to CIEEM guidelines, the definitions of sensitivity, importance and magnitude have been informed by the Ratcliffe Criteria (1997) and In Practice Magazine (September 2000). Professional judgement has been used to produce the definitions in line with these sources.

23.5.3.1.1 Receptor Sensitivity and Importance

75. **Table 23-10** defines the levels of sensitivity determined for ecological receptors for onshore ecology and ornithology, as per the sources cited in **Section 23.5.3.1**.

Table 23-10 Definition of Sensitivity for Onshore Ecology and Ornithology Receptors

Sensitivity	Definition
High	The receptor has no ability to tolerate this effect or avoid the impact. This results in a long-term (i.e. 10 years or more) permanent change to the receptor's abundance or quality.
Medium	The receptor has some ability to tolerate this effect or avoid the highest magnitude of the impact. The receptor does undergo a change in abundance or quality, but can partially adapt and recover to an acceptable status over one to 10 years.
Low	The receptor is not affected by the effect. The impact is avoided entirely, and no detectable change occurs in abundance or quality. The receptor recovers completely within one year.

76. **Table 23-11** defines the levels of importance determined for ecological receptors for onshore ecology and ornithology, as per the sources cited in **Section 23.5.3.1**.

Table 23-11 Definition of Importance for Onshore Ecology and Ornithology Receptors

Importance	Definition
High	Species and habitats (features) that are cited as designated features of protected sites, on either an international or national scale. Examples include features cited within Special Areas of Conservation and Ramsar sites. A feature which is of distinctly high quality and can be cited as a prime example of such a feature, making it unique or unusual enough to warrant designation under European legislation (e.g. SAC). A feature which is of distinctly high quality and can be cited as one of the best examples of such a feature in a national context, making it unique or unusual enough to warrant designation under national legislation (e.g. SSSI). Features listed as Priority Habitat or Priority Species in the context of it stating that all areas or occurrences of the feature should have protection.
Medium	A feature which is of distinctly high quality and can be cited as a prime example of such a feature on a county or regional level, making it unique or unusual enough to have conservation value. Features listed as cited interest under local-level designated sites (LWS) or Local Nature Reserves (LNR). Presence of a feature under a Local Biodiversity Action Plan (LBAP), in the context of it stating that all areas or occurrences of the feature should have protection.

Importance	Definition
Low	Features which hold district level importance and are of local nature conservation value but do not have sufficient value to award a formal nature conservation designation.
Negligible	Features which are commonplace and only important on a local level, the loss of which would not be to the detriment of the ecology of the given area.

77. CIEEM places the emphasis on using professional judgement when considering importance of ecological receptors, based on available guidance, information and expert advice (CIEEM, 2016). Various aspects of ecological importance should be taken into account, including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and multi-functional features.

23.5.3.1.2 Impact Magnitude

78. **Table 23-12** defines the levels of sensitivity determined for ecological receptors for onshore ecology and ornithology, as per the sources cited in **Section 23.5.3.1**.

Table 23-12 Definition of Magnitude of Impacts on Onshore Ecology and Ornithology Receptors

Magnitude	Definition
High	The impact is likely to have an adverse effect on the integrity of a site or the conservation status of a species or species assemblage.
Medium	The impact adversely affects an ecological or ornithological receptor but is unlikely to adversely affect its integrity or conservation status.
Low	The impact adversely affects an ecological or ornithological receptor but would not adversely affect its integrity or conservation status.
Negligible	There would be minimal effect on the ecological or ornithological receptor.
No change	There would be no detectable change from the baseline condition of the ecological or ornithological receptor.

23.5.3.1.3 Effect Significance

79. The assessment of significance of an effect is informed in combination with the sensitivity and importance of the receptor and the magnitude of the impact. The determination of significance is guided by the use of an impact significance matrix presented in **Chapter 6 Environmental Impact Assessment Methodology** (**Table 23-13**). Definitions of each level of significance are provided in **Table 23-14.** For the purposes of this assessment, any effect that is of major or moderate significance is considered to be significant in EIA terms, whether this be adverse or beneficial. Any effect that has a significance of minor or negligible is not significant.

80. Although current CIEEM guidelines discourage the use of matrices in ecological assessment, it is acknowledged that it can be important for EIA purposes, and thus has been used for the purpose of this assessment.

Table 23-13 Onshore Ecology and Ornithology Significance of Effect Matrix

		Adverse Effect				Beneficial Effect			
		Impact Magnitude							
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Receptor Importance	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 23-14 Definition of Effect Significance for Onshore Ecology and Ornithology

Significance	Definition
Major	Very large or large change in the condition of a receptor, which is likely to be significant at a regional or district level because they form a part of achieving national, regional or local objectives, or could result in statutory objectives being exceeded and / or legislation being breached.
Moderate	Intermediate change in the condition of a receptor, which is likely to be important on a local level.
Minor	Small change in the condition of a receptor, which is unlikely to be important in the local decision-making process but may be raised as a local issue.
Negligible	No discernible change in receptor condition.
No change	No impact, therefore, no change in receptor condition.

23.5.4 Cumulative Effects Assessment Methodology

81. The cumulative effects assessment (CEA) considers other plans and projects that may act collectively with the Project to give rise to cumulative effects onshore ecology and ornithology receptors. The general approach to the CEA for onshore ecology and ornithology involves screening for potential cumulative effects, identifying a short list of plans and projects for consideration and evaluating the significance of cumulative effects. **Chapter 6 Environmental Impact Assessment Methodology** and **Volume 2, Appendix 6.5 Cumulative Effects Screening Report – Onshore** and provide further details on the general framework and approach to the CEA.

23.5.5 Biodiversity Net Gain

82. BNG describes an approach to how the Project will implement mitigation to leave the natural environment in a measurably better state than it was before. The approach does not replace the mitigation hierarchy, nor does it replace the legal obligation to protect the habitat and species identified within and in the vicinity of the Onshore Development Area, including designated sites or habitats.

83. As of November 2025, under the Environment Act 2021, it is anticipated that DCO applications will be legally required to ensure a 10% BNG for all NSIP. As this Project is an NSIP, it is therefore expected to be required to deliver 10% BNG for the onshore components of the Project. Where required under emerging regulatory requirements for Nationally Significant Infrastructure Projects, a BNG Strategy is secured through (Commitment ID CO82), as detailed in **Table 23-5**.

84. The ten good practice principles of delivering BNG developed by CIEEM, IEMA and CIRIA (Baker, *et al.,* 2019) will be closely considered and encompassed when developing the BNG Strategy at ES stage. These principles are:

- Principle 1: apply the mitigation hierarchy. Avoid and then minimise impacts on biodiversity. As a last resort, and in agreement with stakeholders and decision-makers, compensate for losses that cannot be avoided;
- Principle 2: avoid losing biodiversity that cannot be offset by gains elsewhere. Avoid impacts on irreplaceable biodiversity – these impacts cannot be offset;
- Principle 3: be inclusive and equitable. Engage stakeholders in designing, implementing, monitoring and evaluating the approach to net gain. Share the benefits fairly among stakeholders;
- Principle 4: address risks. Mitigate difficulty and/or uncertainty using well accepted ways to add contingency when calculating biodiversity losses and gains;
- Principle 5: make a measurable net gain contribution. Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities;
- Principle 6: achieve the best outcomes for biodiversity. Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge;
- Principle 7: be additional. Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e., do not deliver something that would occur anyway);
- Principle 8: create a net gain legacy. Ensure net gain generates long-term benefits;
- Principle 9: optimise sustainability. Prioritise BNG and, where possible, optimise the wilder environmental benefits for a sustainable society and economy; and
- Principle 10: be transparent. Communicate all net gain activities in a transparent and timely manner, sharing the learning with all stakeholders.

85. The Statutory Biodiversity Metric from Defra (2025) has been completed in accordance with the statutory biodiversity metric user guide (Defra, 2024) to determine the baseline value of the habitats surveyed within the Onshore Development Area (**Volume 2**, **Appendix 23.5 Statutory Biodiversity Metric Calculator**). Once the Onshore Development Area is further refined at ES stage, the Statutory Biodiversity Metric Calculator will be updated. This will inform the Outline BNG Strategy which is to be submitted with the DCO application. It should be noted that the boundary of the Onshore Development Area is anticipated to be reduced between PEIR and ES stage and, as such, there will be a corresponding reduction in the area of habitat present, and the total baseline value.

23.5.6 Assumptions and Limitations

86. This chapter provides a preliminary assessment of the likely significant effects of the Project in relation to onshore ecology and ornithology using information available at the time of drafting as described in **Chapter 6 Environmental Impact Assessment Methodology**. This assessment will be refined and presented in the ES to be submitted with the DCO application.

87. Any data from the local environmental records centre NEYEDC should be caveated with the recognition that the data comes from many different sources and therefore cannot be guaranteed for accuracy. Any gaps in the data should not be taken to mean there is an absence of a given species or habitat, and so, as a starting point, the assessment assumes that protected and notable species are present within any potentially suitable habitat.

88. The aim of the PEA survey is to provide an initial assessment of the habitats and potential species present. At the time of writing, approximately 70% of the Onshore Development Area, and a 50m buffer around this area, have been subject to PEA surveys. This is considered a robust spatial coverage and sufficient to inform a preliminary assessment of potential effects. However, further detailed surveys will be required to inform the baseline ecological conditions of the Onshore Development Area and a more robust assessment of effects for ES Stage. Further surveys will include completion of PEA, habitat condition assessments and GCN HSI surveys of land that was not accessed during 2024. In addition, a suite of targeted species surveys will be undertaken in 2025 to provide a detailed baseline of species present within the Onshore Development Area and to inform the assessment at ES stage. Details of the ongoing and additional targeted species surveys are outlined in **Section 23.5.2.2**.

89. RCA surveys of the watercourses identified within the Onshore Development Area are yet to be carried out to fully inform the current BNG calculations (**Volume 2, Appendix 23.5 Statutory Biodiversity Metric Calculator**). In lieu of this information, precautionary values have been assigned to the relevant watercourses which have given them a maximum BNG value as a worst-case-scenario. RCA surveys are proposed for 2025, as detailed within **Table 23-8**.

23.6 Baseline Environment

23.6.1 Existing Baseline

23.6.1.1 Statutory Designated Sites

90. Statutory designated sites of ecological importance that are located within 2km of the Onshore Development Area are presented in **Table 23-15** internationally designated sites of ecological importance within 10km of the Onshore Development Area are also included.

91. **Table 23-15** also provides a summary of the qualifying features and reasons for notification of these designated sites. **Figure 23-2** and **Figure 23-3** provide the location of statutory designated sites in relation to the Onshore Development Area.

92. National Site Network sites have also been assessed as part of the Project's HRA (**Report to Inform Appropriate Assessment** (document reference 5.3)). Where their qualifying features may be affected by the development of the Project, they have been assessed individually within this chapter.

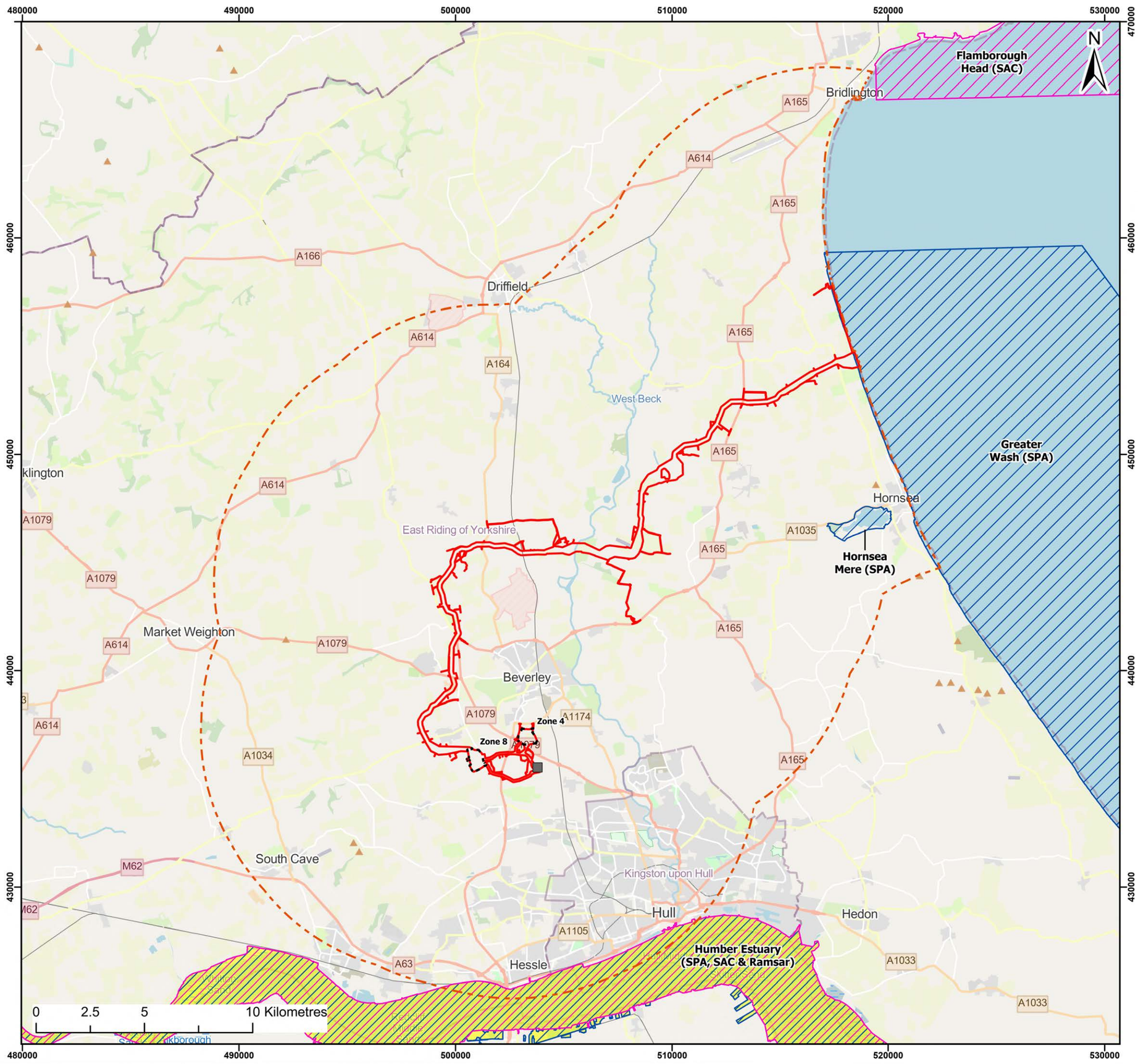
93. Flamborough Head SAC has an offshore component which is within 10km of the Onshore Development Area. However, as detailed within **Section 23.4.2**, it is beyond the Study Area of this assessment and is not considered further.

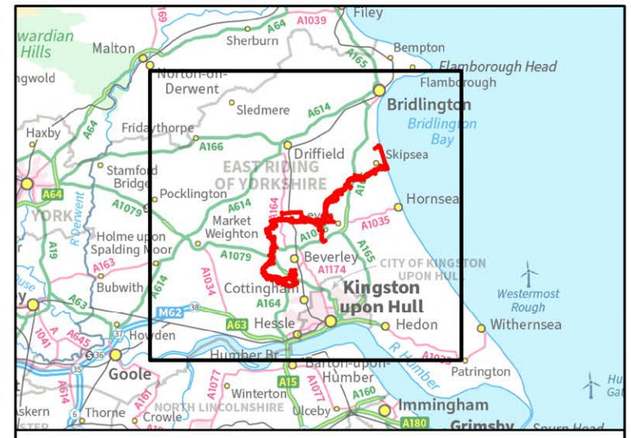
Table 23-15 Statutory Designated Sites of Ecological Importance Within 2km of the Onshore Development Area, and Internationally Designated Sites of Ecological Importance Within 10km of the Onshore Development Area

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
Leven Canal	SSSI	Within the Onshore Development Area	The SSSI supports wetland plants and is an important remnant of previously widespread vegetation.

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
Greater Wash	SPA	0km / adjacent to the Onshore Development Area	The Greater Wash SPA covers c. 3,536km^2 and is designated for important areas of sea used by waterbirds throughout the year. The site is designated for three non-breeding species: red-throated diver *Gavia stellata*, little gull *Hydrocoloeus minutus*, and common scoter *Melanitta nigra*. The site is also designated for three breeding species: sandwich tern *Thalasseus sandvicencis*, little tern *Sternula albifrons*, and common tern *Sterna hirundo*.
Beverley Parks	LNR	0.25km east of the Onshore Development Area	The site has four parts with a mixed broadleaved woodland, an orchard and two fields. It includes the largest recently planted non-commercial orchard of traditional northern apple varieties. The two fields are being restored as traditional parkland.
Bryan Mills Field	SSSI	0.1km north of the Onshore Development Area	The site comprises a tall fen community which occupies the centre of a small ungrazed field, the surrounding drier areas of which have been planted with trees. This low-lying central area of the field is wet and apparently spring-fed. The fen area has developed over a complex of spring heads which create small areas of surface water.
Burton Bushes	SSSI	0.8km east of the Onshore Development Area	This natural oak woodland over 200 years old. It is a good example of the woodland characteristic of Holderness Till soils. The undisturbed nature of the soil profile is an important feature of the site.
Tophill Low	SSSI	There are two sites, located 0.8 and 1.2km west of the Onshore Development Area	Tophill Low consists of two artificial storage reservoirs. The site is important as one of few inland standing open water bodies suitable for wintering wildfowl in North Humberside. Tophill Low reservoirs support nationally important concentrations of gadwall, shoveler and tufted duck. As well as locally important populations of goldeneye, great crested grebe *Podiceps cristatus*, mallard, pochard, teal and wigeon.
Pulfin Bog	SSSI	1km south of the Onshore Development Area	The site is one of the last remnants of a fenland reed swamp community valued for its botanical interest. The reedbed provides habitat for breeding birds including reed bunting *Emberiza schoeniclu*s, reed warbler, sedge warblers *Acrocephalus schoenobaenus*.
Hornsea Mere	SPA	6.4km south of the Onshore Development Area	Designated for its ornithological importance, Hornsea Mere consists of a 120ha shallow eutrophic lake with reed swamp, fen, and carr woodland. The mere is principally valued for its importance as a refuge and feeding area for duck species. Wintering species include mallard *Anas platyrhynchos*, teal *A. crecca*, wigeon *A. penelope*, pochard Aythya farina, tufted duck *A. fuligula*, scaup *A. marila*, goldeneye *Bucephala clangula*, goosander *Mergus merganser*, and long-tailed duck *Clangula hyemalis*. Breeding species include mallard, tufted duck, gadwall, pochard, teal, shoveler, reed warbler *Acrocephalus scirpaceus*, and coot *Fulica atra*. The reedbeds also support starling *Sturnus vulgaris* and hirundines roosts. Summering little gulls are also present on the mere.
Humber Estuary	Ramsar site	9.4km south of the Onshore Development Area	An estuary with the tidal range exposing vast mud and sand flats at low tide. Vegetation includes extensive reedbeds, areas of mature and developing saltmarsh, backed by grazing marsh or low sand dunes with marshy slacks and brackish pools. The area regularly supports internationally important numbers of various species of breeding and wintering waterbirds. Many passage birds, notably internationally important populations of ringed plover, *Charadriu*

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
			hiaticula, and sanderling *Caldris alba* stage in the area. The site supports Britain's most southeasterly breeding colony of grey seal *Halichoerus grypus*.
Humber Estuary	SAC	9.4km south of the Onshore Development Area	Annex I habitats that are a primary reason for selection of this site: 1130 estuaries, 1140 mudflats and sandflats not covered by seawater at low tide. Annex I habitats present as a qualifying feature, but are not a primary reason for selection of the site: 1110 sandbanks which are slightly covered by sea water all the time, 1150 coastal lagoons (priority feature), 1310 Salicornia and other annual colonizing mud and sand, 1330 Atlantic salt meadows *Glauco-Puccinellietalis maritimae*, 2110 Embryonic shifting dunes, 2120 “shifting dunes along the shoreline with Ammophila arenaria (“white dunes”)”, 2130 “Fixed coastal dune with herbaceous vegetation (“grey dunes”)”, 2160 Dune with *Hippopha rhamnoides*. Annex II 1095 sea lamprey *Petromyzon marinus*, 1099 river lamprey *Lampetra fluviatilis*, and 1364 grey seal.
Humber Estuary	SPA	9.4km south of the Onshore Development Area	The Humber Estuary comprises extensive wetland and coastal habitats. The inner estuary supports extensive areas of reedbed, with areas of mature and developing saltmarsh backed by grazing marsh in the middle and outer estuary. On the north Lincolnshire coast, the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The estuary supports important numbers of waterbirds (especially geese, ducks and waders) during the migration periods and in winter. In summer, it supports important breeding populations of bittern *Botaurus stellaris*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and little tern.





Legend:

- Onshore Development Area
- Onshore Development Area 10km Buffer
- Onshore Converter Station Zone Options
- Indicative Birkhill Wood Substation Location
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Internationally Designated Ecological Sites Within 10km

Figure: 23-2

Drawing No: PC6250-RHD-XX-ON-DR-GS-0316

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Co-ordinate system: British National Grid

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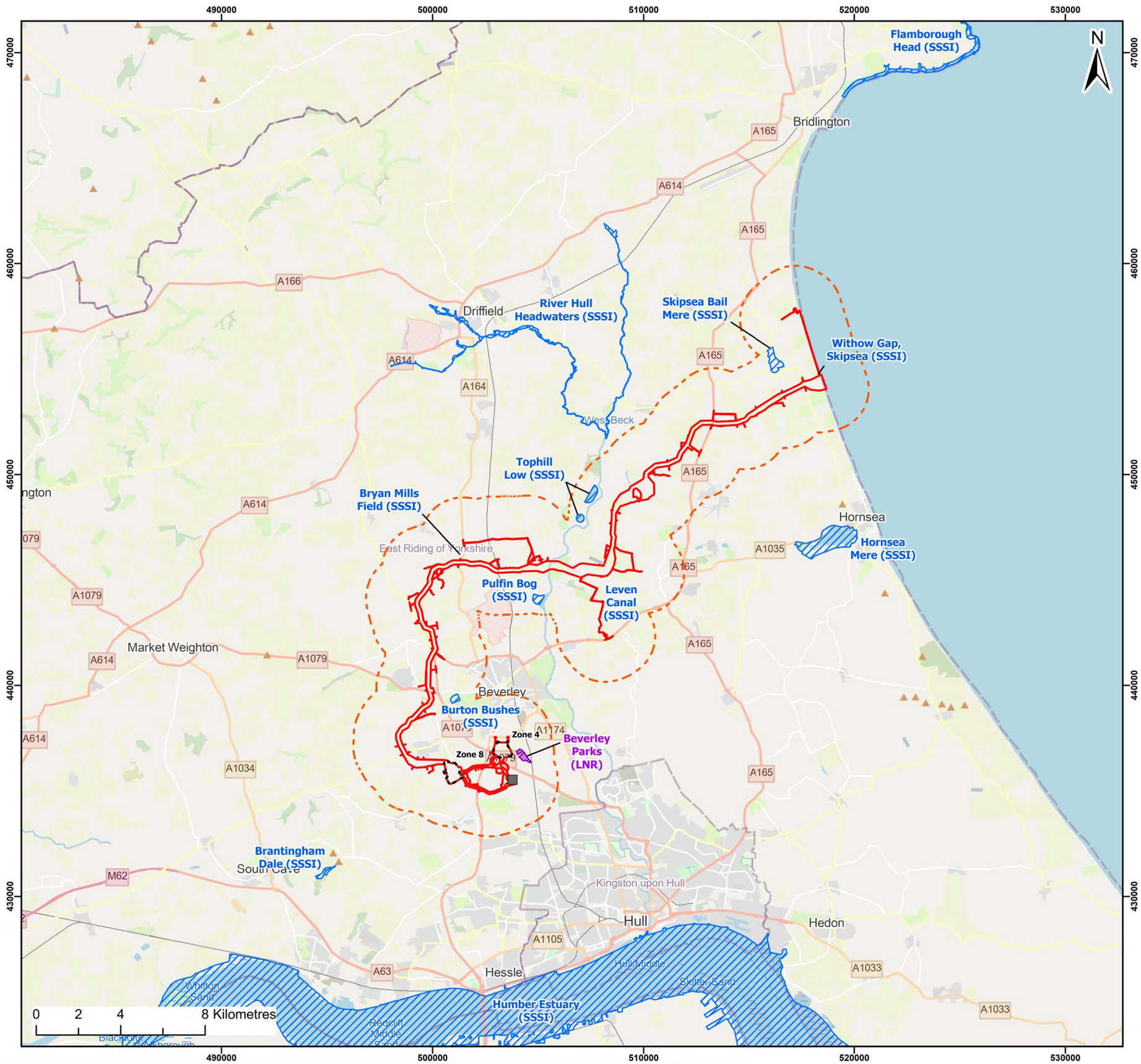

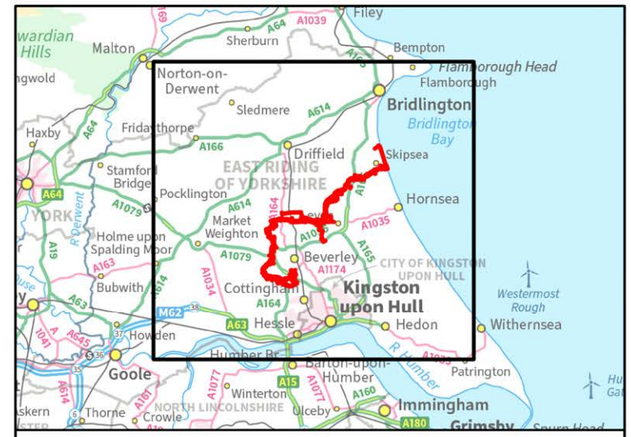

Legend:

- Onshore Development Area
- Onshore Development Area 2km Buffer
- Onshore Converter Station Zone Options
- Indicative Birkhill Wood Substation Location
- Site of Special Scientific Interest (SSSI)
- Local Nature Reserve (LNR)

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Nationally Designated Ecological Sites Within 2km (and SSSI with Risk Impact Zones which extent up to 2km from Onshore Development Area)

Figure: 23-3

Drawing No: PC6250-RHD-XX-ON-DR-GS-0317

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Co-ordinate system: British National Grid

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23.6.1.2 Non-Statutory Designated Sites

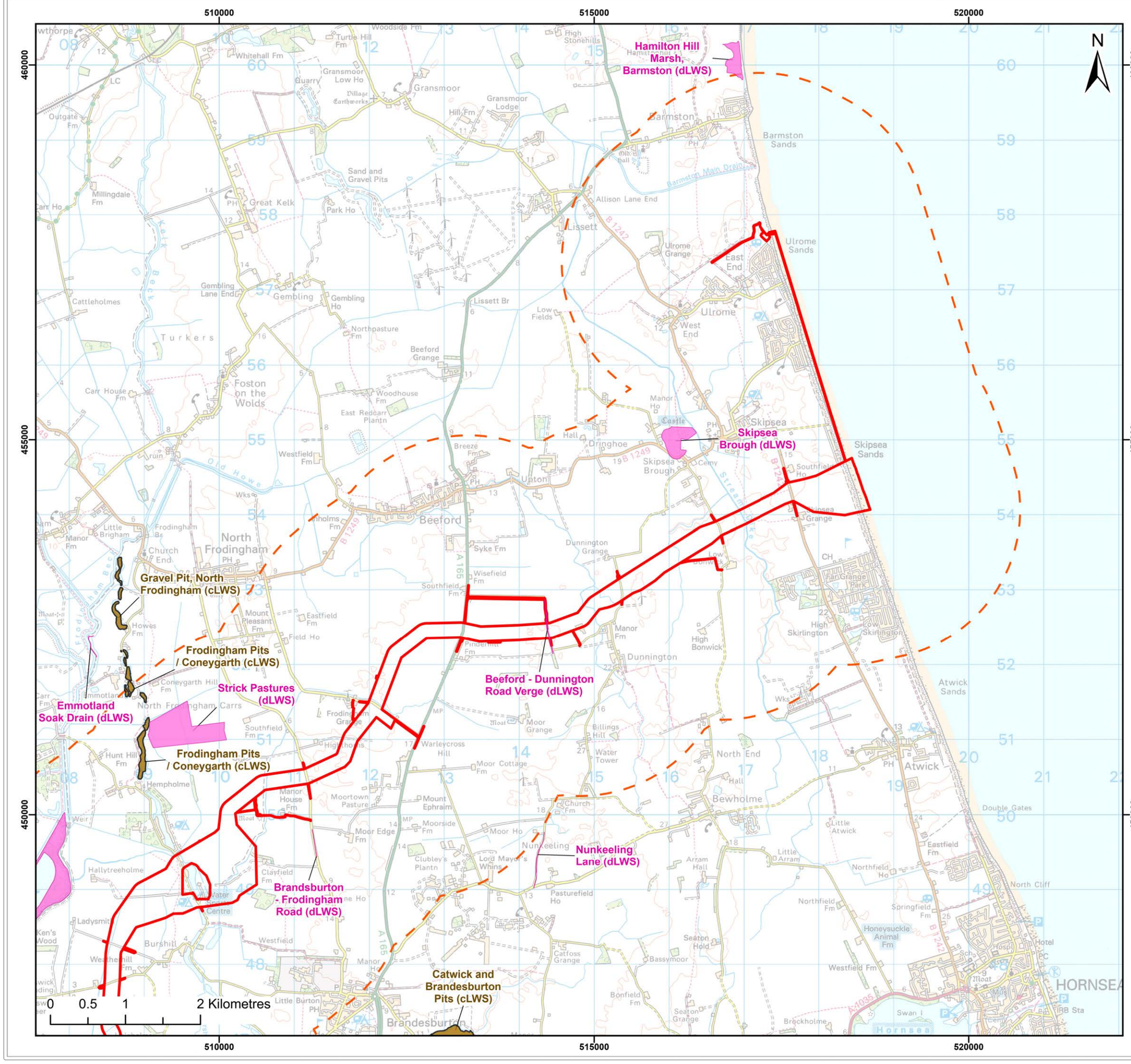
94. Non-statutory designated sites for nature conservation that are located within the Study Area are presented in **Table 23-16** and shown in **Figure 23-4**. **Table 23-16** also provides a summary of the qualifying features and reasons for notification of these designated sites.

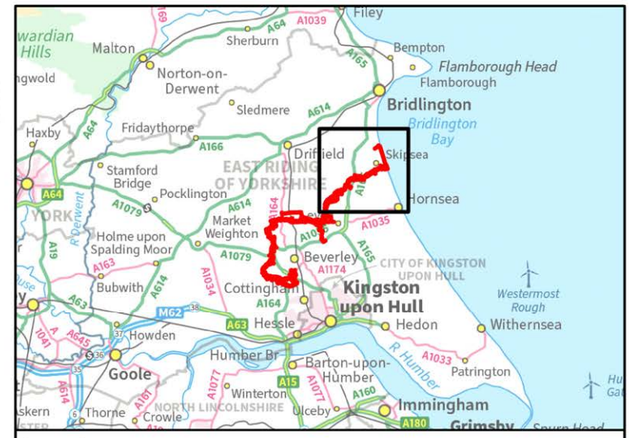
Table 23-16 Non-Statutory Designated Sites for Nature Conservation Within 2km of the Onshore Development Area

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
Bealey's Lane	LWS	Partially within the Onshore Development Area	Old, established semi-natural neutral grassland.
Bealey's Beck, Lockington	LWS	Within the Onshore Development Area	Stream.
Beeford – Dunnington	LWS	Within the Onshore Development Area	Good quality established semi-natural verge.
Bryan Mills Beck	LWS	Adjacent to the south of the Onshore Development Area.	Nutrient rich standing water.
Fishpond Wood, Risby Estate	LWS	Partially within the Onshore Development area	Mosaic of semi-natural habitats including woodland and wetland that also supports field evidence of features of ancient or long-standing acid woodland.
Jillywood Lane	LWS	Adjacent to the west of the Onshore Development area	Good quality hedgerow, medieval boundary and ancient woodland boundary.
Lake's Wood	LWS	Adjacent to the south of the Onshore Development Area.	Ancient semi-natural woodland.
Leman Wood	LWS	Adjacent to the west of the Onshore Development Area.	Ancient semi-natural woodland with evidence of features to support this.
Raventhorpe Embankment	LWS	Within the Onshore Development Area	Good quality established semi-natural linear grassland.
Risby Park	LWS	Within the Onshore Development Area	Mosaic of semi-natural habitats including woodland and grassland.
Scorborough Lane	LWS	Adjacent to the south of the Onshore Development Area.	Good quality 'vergescape' consisting of a hedgerow with 7 woody species per 30m sample, and verge habitats.
Leman Road Cornere – Moorbeck Road (A)	LWS	Partially within the Onshore Development Area	Good quality established semi-natural verge.
Leman Road Corner – Moorbeck Road (B)	LWS		Good quality established semi-natural verge.
Birkhill Wood	LWS	Adjacent to the west of the Onshore Development Area	Ancient semi-natural woodland with evidence of features to support this
Newbald Road	LWS	Adjacent to the south-western Onshore Development Area boundary	Good quality hedgerow with 7 woody species per 30m sample.
Bygot Wood Lane, Leconfield	LWS	8m north of the Onshore Development Area	Good quality established semi-natural verge.
Brandsburton – Frodingham Road	LWS	70m south of the Onshore Development Area	Good quality hedgerow with 6 woody species per 30m sample.
Drove Road	LWS	110m south of the Onshore Development Area	Semi-natural broadleaved woodland.
Woodhill Path, Cottingham	LWS	200m south of the Onshore Development Area	Good quality hedgerow with 6 woody species per 30m sample.
Barff Hill Causeway	LWS	240m north of the Onshore Development Area	Nutrient rich standing water in roadside ditch

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
Bentley Moor Wood	LWS	260m west of the Onshore Development Area	Ancient semi-natural woodland
Moor Lane	LWS	315m north-east of the Onshore Development Area	Good quality hedgerow with 6 woody species per 30m sample.
Old Lane, Leconfield	LWS	350m east of the Onshore Development Area	Good quality 'vergescape' consisting of a hedgerow with 6 woody species per 30m sample, and verge habitats.
Lockington	LWS	500m north of the Onshore Development Area	Old, established semi-natural neutral grassland.
Strick Pastures	LWS	600m north-west of the Onshore Development Area	Mosaic of semi-natural habitats including grassland and nutrient-rich standing water in the ditches.
Skipsea Brough	LWS	800m north of the Onshore Development Area	Old, established semi-natural neutral and calcareous grassland.
Keldmarsh	YWT	830m north of the Onshore Development Area	Chalk springs within an area of wet woodland.
Low Balk Road, Bishop Burton	LWS	1km west of the Onshore Development Area	Good quality established semi-natural verge.
Tophill Low	LWS	1km west of the Onshore Development Area	Mosaic of semi-natural habitats including grassland, fen and standing water. Has good examples of old, established semi-natural neutral and calcareous grassland, rich-fen and nutrient rich standing water habitats.
Beverley Westwood Waxcaps	LWS	1.1km north-west of the Onshore Development Area	Site supports an assemblage of eight or more species of waxcaps from multiple visits
Pulfin Bog	YWT	1.1km south of the Onshore Development Area	Marsh habitat with a variety of marsh flowers.
North Newbald – Beverley Road	LWS	1.1km west of the Onshore Development Area	Good quality established semi-natural verge.
Frodingham Pits / Coneygarth	LWS	1.15km south-east of the Onshore Development Area	Standing water.
Low Farm, Routh	LWS	1.2km east of the Onshore Development Area	Good quality hedgerow.
Newbald Road, Beverley	LWS	1.3km south-east of the Onshore Development Area	Good quality hedgerow.
Watton Carr	LWS	1.5km north of the Onshore Development Area	Wetland site that regularly supports significant populations of at least 10 species of overwintering water-birds of conservation concern.
Lockington Wood	LWS	1.5km north-west of the Onshore Development Area	Ancient semi-natural woodland.
Driffield Road	LWS	1.7km east of the Onshore Development Area	Good quality hedgerow with 6 woody species per 30m sample.
Mill Beck and Fields	LWS	1.7km south-east of the Onshore Development Area	Old, established semi-natural neutral grassland
Leconfield Low Parks	LWS	1.78km east of the Onshore Development Area	Grassland, scrub and standing water.
Beverley Limekilns	LWS	1.8km east of the Onshore Development Area	Old, established semi-natural neutral and calcareous grassland.
Figham Pastures	LWS	1.8km north-east of the Onshore Development Area	Mosaic of semi-natural habitats including grassland and wetland.

Name	Type of Designation	Distance from Onshore Development Area	Qualifying Features
Cote Wood	LWS	1.8km south-east of the Onshore Development Area	Ancient semi-natural woodland that is also assigned to W8 NVC Community.
Etton – Gardham Disused Railway	LWS	1.8km west of the Onshore Development Area	A range of chalk grassland species including a small population of the Hawkweed *Oxtongue Picris hieracioides*.
Hamilton Hill Marsh – Barmston	LWS	1.9km north of the Onshore Development Area	Semi-natural coastal habitat which supports good examples of brackish fen and swamp and coastal sand dunes
Mill Dam Beswick	LWS	1.9km north of the Onshore Development Area	Nutrient rich standing water.





Legend:

- Onshore Development Area
- Onshore Development Area 2km Buffer
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Non-Statutory Designated Ecological Sites Within 2km - Sheet 1 of 3

Figure: 23-4 | Drawing No: PC6250-RHD-XX-ON-DR-GS-0538

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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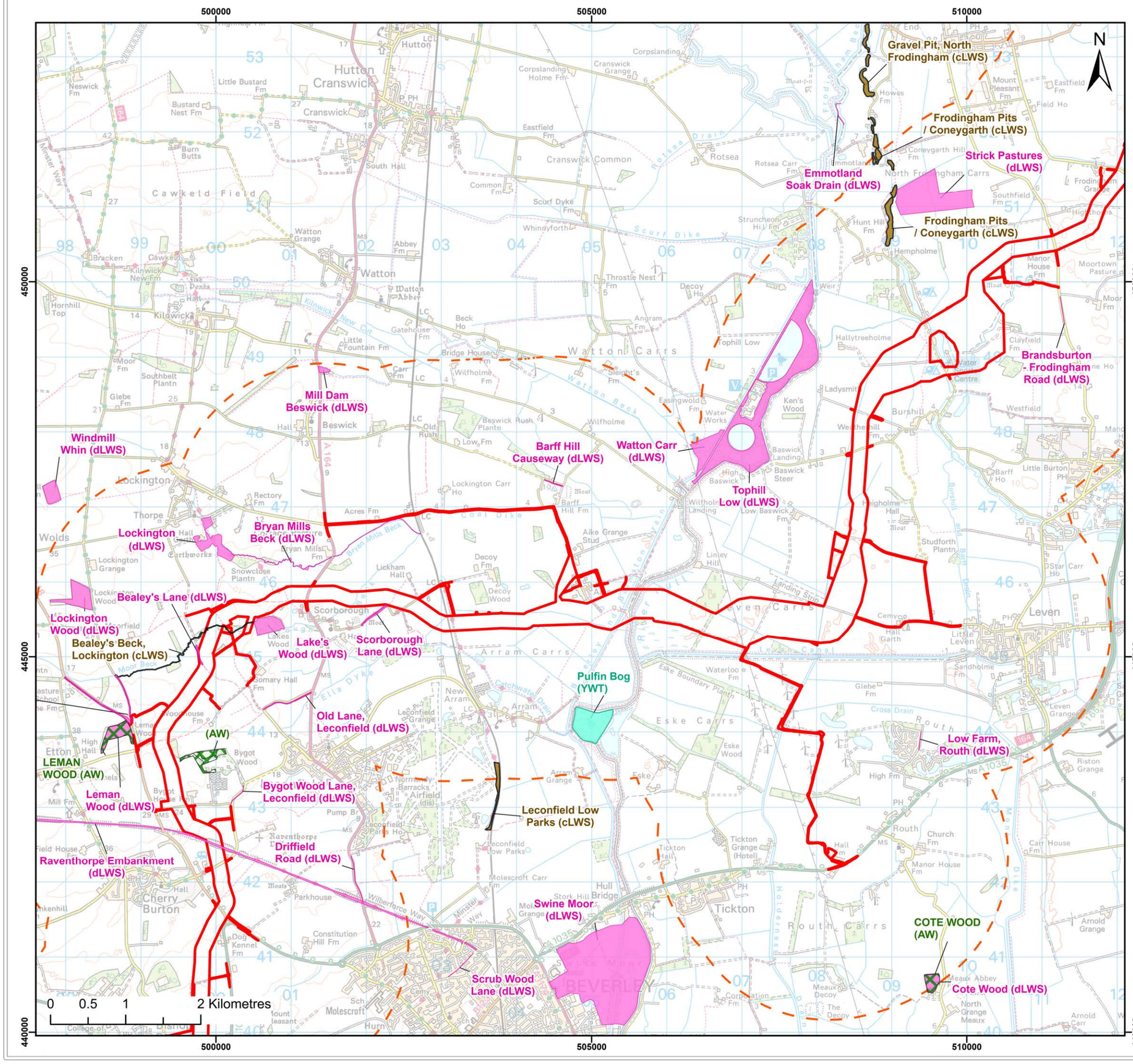

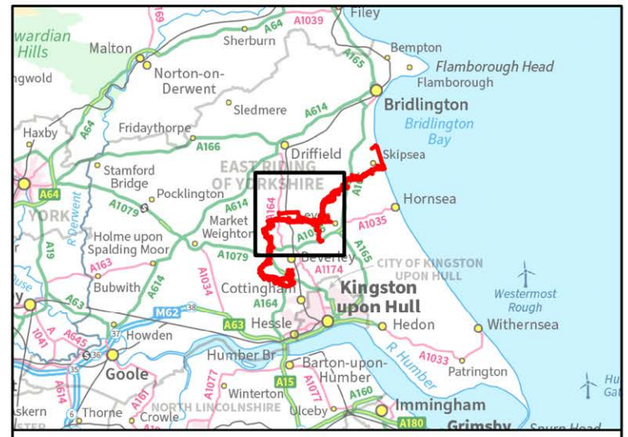

Legend:

- Onshore Development Area
- Onshore Development Area 2km Buffer
- Ancient Woodland
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)
- Yorkshire Wildlife Trust Reserves (YWT)

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Non-Statutory Designated Ecological Sites Within 2km - Sheet 2 of 3

Figure: 23-4
Drawing No: PC6250-RHD-XX-ON-DR-GS-0538

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Co-ordinate system: British National Grid

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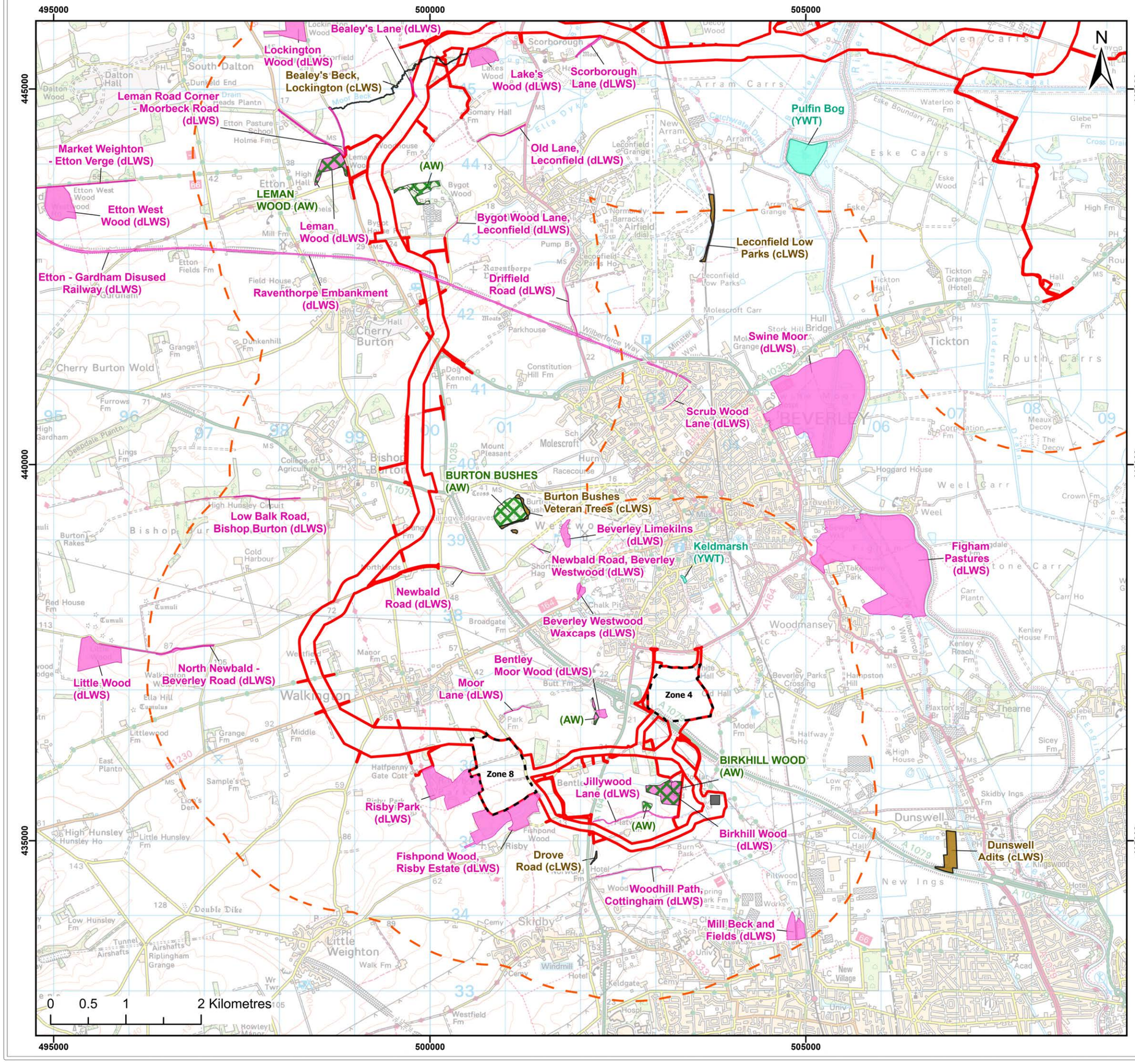

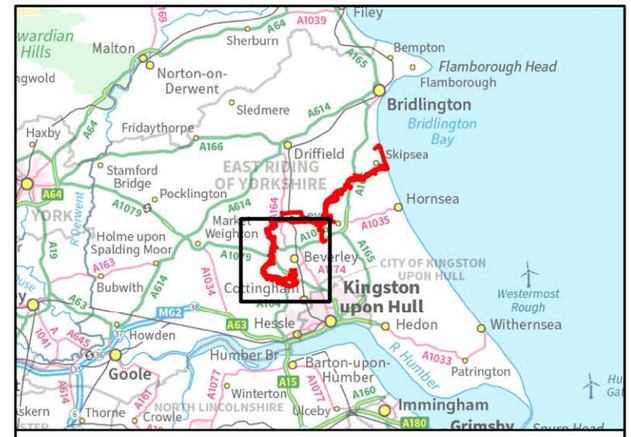

Legend:

- Onshore Development Area
- Onshore Development Area 2km Buffer
- Onshore Converter Station Zone Options
- Indicative Birkhill Wood Substation Location
- Ancient Woodland
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)
- Yorkshire Wildlife Trust Reserves (YWT)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Non-Statutory Designated Ecological Sites Within 2km - Sheet 3 of 3

Figure: 23-4

Drawing No: PC6250-RHD-XX-ON-DR-GS-0538

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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23.6.1.3 Habitats and Protected and Notable Species

95. This section provides a summary of the habitats and protected and notable species within and surrounding the Onshore Development Area for desk-based assessment and PEA survey, based on information from **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**. The Study Areas for each ecological receptor are defined in **Section 23.4.1** and **Table 23-3.**

23.6.1.3.1 Ancient Woodland and Veteran Trees

96. The desk study report identified the presence of seven areas of ancient woodland within 2km of the Onshore Development Area, as listed within the Ancient Woodland Inventory (AWI). These are presented within **Figure 23-4** and **Table 23-17**.

Table 23-17 Ancient Woodland Present Within 2km of the Onshore Development Area

Woodland Name	Distance from Onshore Development Area	Ancient Woodland Site Description
Leman Wood	Adjacent to the west of the Onshore Development Area	Ancient and semi-natural woodland
Birkhill Wood	Adjacent to the west of the Onshore Development Area	Ancient, semi-natural woodland, and ancient replanted woodland
Bygot Wood	60m east of the Onshore Development Area	Ancient, semi-natural woodland, and ancient replanted woodland
Bentley Moor Wood	300m north of the Onshore Development Area	Ancient and semi-natural woodland
Jillywood Lane	370m north-east of the Onshore Development Area	Ancient and replanted woodland
Burton Bushes	800m east of the Onshore Development Area	Ancient and semi-natural woodland
Cote Wood	1.8km south of the Onshore Development Area	Ancient and semi-natural woodland

97. The following veteran tree species were recorded during the 2024/25 high-level tree surveys of the Onshore Development Area and within 15m of the Onshore Development Area (for further information see **Volume 2, Appendix 23.4 Arboricultural Survey Report**):

- Ash *Fraxinus excelsior*;
- Pedunculate oak *Quercus robur*;
- One white willow *Salix alba*; and
- One crack willow *Salix fragilis*.

23.6.1.3.2 Priority Habitats

98. According to Naturals England's priority habitat inventory, the following priority habitats in **Table 23-18** are within 2km of the Onshore Development Area. The location of Natural England's priority habitat inventory within and adjacent to the Onshore Development Area is shown in **Figure 8** within **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report.**

Table 23-18 Priority Habitats Present Within 2km of the Onshore Development Area

Priority Habitat	Number of Parcels within 2km of the Onshore Development Area	Within or Adjacent to the Onshore Development Area
Lowland mixed deciduous woodland	277	10 parcels within the Onshore Development Area (approximately 4.45ha)
Maritime cliff and slope	5	Two parcels within the Onshore Development Area (approximately 1.73ha)
Traditional orchard	37	One parcel within the Onshore Development Area (approximately 0.04ha)
Coastal and floodplain grazing marsh	184	Six parcels within the Onshore Development Area (approximately 4.08ha)
Lowland fens	9	Five parcels within the Onshore Development Area (approximately 1.54ha)
Reedbeds	3	Adjacent to north-west of the Onshore Development Area

99. The following priority habitats were further identified during the PEA surveys:

- Lowland mixed deciduous woodland;
- Lowland beech and yew woodland;
- Wet woodland;
- Arable field margins;
- Maritime cliff and slope;
- Traditional orchard;
- Hedgerows;
- Reedbeds;
- Rivers; and
- Ponds.

23.6.1.3.3 Surveyed Habitats

100. The following habitats were recorded during the 2024 PEA surveys of the Onshore Development Area and adjacent 50m Study Area (for further information see **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report** and **Figure 23-1**):

- Arable farmland dominates the Onshore Development Area, comprising habitats such as other cereal crops (c1c7), other non-cereal crops (c1d8), and winter stubble (c1c5);
- Grasslands, largely consisting of modified grassland (g4), neutral grassland (g3) and other neutral grassland (g3c);
- Woodland, including but not limited to other broadleaved woodland (w1g), lowland mixed deciduous woodland (w1f), and other Scot's pine woodland (w2b); and
- smaller areas of other habitats, including but not limited to arable field margins (c1a), developed land sealed surface (u1b), beach (t2h), standing open water and canals (r1), built linear features (u1e), and a variety of scrub habitats (h3).

101. A detailed breakdown of the habitats by area can be found in **Table 23-19** and a breakdown of linear habitats by km can be found in **Table 23-20**.

Table 23-19 UKHab Area Habitats Identified by the PEA Surveys Within the Onshore Development Area and 50m Buffer

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
c1c7	Other cereal crops	339.74	Other cereal crops were in large patches present throughout south-western most and north-western most aspects of the survey area, some isolated fields towards the centre. Key species observed during the PEA surveys included: bread wheat *Triticum aestivum*, six-rowed barley *Hordeum vulgare*, fat-hen *Chenopodium album*, common orache *Atriplex patula*, and common fiddleneck *Amsinckia micrantha*.
c1c5	Winter stubble	269.72	Patches within consecutive adjoining fields along the length of the survey area. Key species observed during the PEA surveys included: bread wheat, six-rowed barley, scentless mayweed *Tripleurospermum inodorum*, and an individual tree of pedunculate oak *Quercus robur*.
c1	Arable and horticulture	168.12	Arable and horticulture habitat was present in small regular patches throughout south-western and north-western aspects of the survey area. Key species observed during the PEA surveys included: curled dock *Rumex crispus*, creeping thistle *Cirsium arvense,* great willowherb *Epilobium hirsutum*, false oat-grass *Arrhenatherum elatius,* and common reed *Phragmites australis*.
c1d8	Other non-cereal crops	145.01	Other non-cereal crops were present in small patches of single fields throughout the length of the survey area, most frequently in the south-west. Key species observed during the PEA surveys included: broad bean *Vicia faba*, pale flax *Linum bienne*, buckwheat *Fagopyrum esculentum*, beet *Beta vulgaris*, potato *Soanum tuberosum*, rape *Brassica napus*, and sunflower *Helianthus annuus*.

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
g4	Modified grassland	114.93	Modified Grassland was located sporadically throughout the survey area, most frequently in clusters of grazing fields and roadside verges. Key species observed during the PEA surveys included: perennial rye grass *Lolium perenne*, canary-grass *Phalaris canariensis*, common couch *Elymus repens*, red fescue *Festuca rubra*, common bent *Agrostis capillaris*, common nettle *Urtica dioica*, and false oat-grass *Arrhenatherum elatius*.
c1c	Cereal crops	103.17	Creal crops were located in small patches sporadically through the south-western and northern most parts of the survey area, the largest swathe being over 10 fields in the west. Key species observed during the PEA surveys included: bread wheat, six-rowed barley, pineapple weed *Matricaria discoidea*, scentless mayweed, and common bent.
c1d	Non-cereal crops	45.13	Non-cereal crops were present in sporadic, isolated fields throughout the survey area. Key species observed during the PEA surveys included: broad bean, elephant grass *Cenchrus purpureus*, turnip *Brassica rapa*, and flax *Linum usitatissimum*.
g3c	Other neutral grassland	41.33	Other neutral grassland was made up of small strips adjacent to agricultural fields, most frequently within the western section of the survey area. Key species observed during the PEA surveys included: Yorkshire fog, cock's foot, perennial rye grass, false oat-grass, tufted hair grass *Deschampsia cespitosa*, red fescue, common bent, elephant grass, meadow barley *Hordeum secalinum*, oat, spear thistle, white clover, and creeping buttercup.
c1b6	Legume-rich ley	33.88	Legume-rich ley occurred mainly as several adjoining fields at the centre of the of the survey area. Key species observed during the PEA surveys included: clover *Trifolium pratense*, white clover, bread wheat, and false oat-grass.
c	Cropland	14.81	Cropland was present in two separate areas towards the centre of the survey area near Brandesburton.
w1g	Other broadleaved woodland	13.84	Other broadleaved woodland was present in small patches throughout the survey area, most frequently towards the southern and western aspects. Key species observed during the PEA surveys included: ash *Fraxinus excelsior*, aspen *Populus tremula,* beech *Fagus sylvatica*, crack willow *Saliz fragilis*, eastern balsam-poplar *Populus balsamifera*, evergreen oak *Quercus ilex*, field maple *Acer campestre,* grey poplar *Populus alba*, hawthorn *Crataegus monogyna*, Scots pine *Pinus sylvestris*, silver birch *Betula pendula*, and sycamore *Acer pseudoplatanus*.
g3c8	Holcus-Juncus neutral grassland	13.57	Holcus-Juncus neutral grassland consisted of one large field at the north-eastern most section of the survey area. Key species observed during the PEA surveys included: fog, creeping thistle, and common ragwort *Jacobaea vulgaris*.
u1b	Developed land sealed surface	12.70	Developed land sealed surface consisted of roads and walking or cycling routes.
t2h	Beach	11.36	Beach habitat was only present at the eastern most part of the survey area, partially within the Withow Gap SSSI.
w1f	Lowland mixed deciduous woodland	11.38	Lowland mixed deciduous woodland was present partially within the survey area and partially within the Onshore Development Area. Key species observed during the PEA surveys included: beech *Fagus sylvatica*, field maple *Acer campestre*, horse-chestnut *Aesculus hippocastanum*, pedunculate oak, sycamore, hawthorn, common ivy *Hedera helix*, and common nettle. This habitat is a subset of the priority habitat 'broadleaved, mixed and yew woodland' and is within the LBAP (East Riding of Yorkshire Council, 2010).

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
c1b5	Rye-grass and clover ley	11.35	Rye-grass and clover ley habitat occurred in small clusters within the north-east and south aspects, and two larger areas at the south-western aspect of the survey area. Key species observed during the PEA surveys included: perennial rye grass, white clover, and dandelion *Taraxacum spp*.
c1d5	Miscanthus	11.11	Miscanthus occurred in a single cluster of several habitats within the western aspect of the survey area near Beverley. Key species observed during the PEA surveys included elephant grass.
c1f5	Annuals horticulture	9.3	Annuals horticulture occurred as one large field in the west of the survey area. Key species observed during the PEA surveys included broad beans.
c1a5	Arable field margins - tussocky	6.25	Arable field margins tussocky habitat occurred within the survey area and the Onshore Development Area. Key species observed during the PEA surveys included: perennial rye grass, great willowherb, Yorkshire fog, false oat grass, crested dog's tail, cock's foot, common knapweed *Centaurea nigra*, common reed *Phragmites australis*. This habitat is a subset of the priority habitat 'arable field margins' and is within the LBAP (East Riding of Yorkshire Council, 2010).
u1e	Built linear feature	6.06	Built linear features included fences, roads, railways and tracks.
u1c	Artificial unvegetated – unsealed surface	5.59	Artificial unvegetated – unsealed surface was mainly present within the south-west and west aspects of the survey area, and occurred infrequently in the rest of the survey area.
u1	Built up areas and gardens	2.84	Built up areas and gardens include barn buildings and gardens within the south-west of the survey area.

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
c1a6	Arable field margins - pollen and nectar	2.75	Arable field margins pollen and nectar habitat were located within the Onshore Development Area. Key species observed during the PEA surveys included: red fescue, crested dog's tail, common bird's foot trefoil *Lotus corniculatus*, and common knapweed. This habitat is a subset of the priority habitat 'arable field margins' and is within the LBAP (East Riding of Yorkshire Council, 2010).
h3h	Mixed scrub	2.68	Mixed scrub was comprised of several separate habitat areas across the survey area. Key species observed during the PEA surveys included: black-grass *Alopecurus myosuroides*, bracken *Pteridium aquilinum*, hedge bindweed *Calystegia sepium*, large bindweed *C. silvatica* hoary willowherb, *Epilobium parviflorum*, meadow thistle *Cirsium dissectum,* rosebay willowherb *Chamaenerion angustifolium* and hawthorn *Crataegus monogyna*.
u1b6	Other developed land	2.64	Other developed land included roads and tracks.
w1h5	Other woodland – mixed – mainly broadleaved	2.31	Other woodland – mixed – mainly broadleaved habitat occurred in the survey area in the form of plantation, lines of trees, and ditches. Key species observed during the PEA surveys included: elder *Sambucus nigra*, field maple *Acer campestre*, evergreen oak, beech, and bramble.
h3d	Bramble scrub	1.99	Dense scrub with Bramble *Rubus fruticosus agg*. dominant. Key species observed during the PEA surveys included: bramble, cow parsley, false oat-grass, perennial rye grass, red fescue, blackthorn, common nettle.
c1b	Temporary grass and clover leys	1.89	Temporary grass or legumes in rotation with grain or tilled crops. Key species observed during the PEA surveys included white clover.

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
w2c	Other coniferous woodland	1.55	Other coniferous woodland was present within and outside of the Onshore Development Area. Key species observed during the PEA surveys included: sitka spruce *Picea sitchensis*, western hemlock-spruce *Tsuga heterophylla*, hawthorn, common nettle and Yorkshire fog.
u1d	Suburban mosaic of developed land and natural surface	1.24	Small-scale mosaic of developed and natural surfaces such as housing or gardens in suburban areas. Key species observed during the PEA surveys included: beech, bramble, hazel *Corylus avellana*, and pedunculate oak.
g3	Neutral grassland	1.12	Vegetation dominated by grasses and herbs on a range of neutral soils. Key species observed during the PEA surveys included: oat-grass, cock's foot, timothy *Phleum pratense*, and Yorkshire fog.
s2a6	Soft rock sea cliffs	0.98	Soft rock sea cliff habitat was present along the coastline, with 50m of it being within the Onshore Development Area. This habitat is a subset of the priority habitat 'supralittoral rock' and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1h6	Other woodland – mixed – mainly conifer	0.98	Other woodland – mixed – mainly conifer habitat was present within the Onshore Development Area. Key species observed during the PEA surveys included: larch *Larix decidua,* ash, beech, sycamore and bracken.
w2b	Other Scot's pine woodland	0.94	Other Scot's pine woodland was present within the Onshore Development Area. Key species observed during the PEA surveys included: Scots pine, spear thistle, and Yorkshire fog.
r1	Standing open water and canals	0.88	Approximately 1.18km of standing open water and canals was present within the Onshore Development Area. Key species observed during the PEA surveys included bulrush *Typha latifoloa* and common nettle.
h3a6	Other blackthorn scrub	0.75	Dense scrub with Blackthorn *Prunus spinosa* dominant in unexposed areas. Key species observed during the PEA surveys included: blackthorn, common nettle, and hawthorn.
h3f	Hawthorn scrub	0.47	Dense scrub with Hawthorn *Crataegus monogyna* dominant. Key species observed during the PEA surveys included: hawthorn, blackthorn, common nettle, and field maple.
u1f	Sparsely vegetated urban land	0.45	Sparsely vegetated urban land was comprised of an area of bare ground and an area of scrub and ruderal. Key species observed during the PEA surveys included creeping bent and Yorkshire fog.
u1b5	Buildings	0.38	Permanent enclosed structures.
r2b	Other rivers and streams	0.31	Other rivers and streams within the survey area covered a distance of approximately 4.44km. Key species observed during the PEA surveys included: common reed, wild gladiolus *Gladiolus llyricus*, common duckweed *Lemna minor*, great willowherb, common nettle, and false oat-grass.
h3a	Blackthorn scrub	0.19	Dense scrub with Blackthorn *Prunus spinosa* dominant. Key species observed during the PEA surveys included blackthorn and false oat-grass.
g3c5	Arrhenatherum neutral grassland	0.13	False oat grass *Arrhenatherum elatius* dominant grassland often found in lightly managed or unmanaged fields or road verges in lowland areas. Key species observed during the PEA surveys included: common bent, false oat-grass, red fescue, and spear thistle.
f2e	Reedbeds	0.09	Reedbeds occurred within the Onshore Development Area. Key species observed during the PEA surveys included: common club-rush *Schoenoplectus lacustris*, common reed, great willow-herb, and yellow iris *Iris pseudacorus*. This habitat is a priority habitat and is within the LBAP (East Riding of Yorkshire Council, 2010).

UKHab Habitat Code	UKHab Habitat	Area (ha)	Habitat Description
c1a	Arable field margins	0.05	Arable field margins were present within the Onshore Development Area. Key species observed during the PEA surveys included: false oat-grass, hogweed, ribwort plantain, and white clover. This is a priority habitat and is within the LBAP (East Riding of Yorkshire Council, 2010)
w1c	Lowland beech and yew woodland	0.05	Lowland beech and yew woodland was present within the Onshore Development Area. This habitat is a subset of the priority habitat 'broadleaved, mixed and yew woodland' and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1	Broadleaved and mixed woodland	0.02	Vegetation dominated by trees that are more than 5m high when mature, which form a distinct, although sometimes open canopy with a canopy cover of greater than 25%. Key species observed during the PEA surveys included: crack willow, sycamore, and bramble. This is a priority habitat and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1d	Wet woodland	0.01	Wet woodland occurred within the Onshore Development Area. Key species observed during the PEA surveys included grey willow *S. cinerea*, and hawthorn. This habitat is a subset of the priority habitat 'broadleaved, mixed and yew woodland' and is within the LBAP (East Riding of Yorkshire Council, 2010).

Table 23-20 UKHab Linear Habitats Identified by the PEA Surveys Within the Onshore Development Area And 50m Buffer

UKHab Habitat Code	UKHab Habitat	Length (km)	Habitat Description
h2a6	Other native hedgerow	56.6	Approximately 50km of other native hedgerow was found within the Onshore Development Area. Key species observed during the PEA surveys included: dogwood *Cornus sanguinea*, hawthorn, ash and blackthorn. This habitat is a subset of the priority habitat 'hedgerows' and is within the LBAP (East Riding of Yorkshire Council, 2010).
r1g	Other standing water	8.09	Puddles, scrapes and ponds which are typically wet for more than half of the year. Key species observed during the PEA surveys included: common reed, great willowherb, water figwort *Scrophularia auriculata, Nasturtium officinale,* hawthorn, false oat-grass, spear thistle, and common nettle.
h2a	Native hedgerow	5.51	Approximately 4.14km of native hedgerow was present within the Onshore Development Area. Key species observed during the PEA surveys included: blackthorn, elder, field maple, hawthorn, ash, buckthorn *Rhamnus cathartica*, bramble and field maple. This habitat is a subset of the priority habitat 'hedgerows' and is within the LBAP (East Riding of Yorkshire Council, 2010).
r1f6	Other temporary ponds and scrapes	1.5	Puddles, scrapes and ponds which are typically dry for more than half of the year. Key species observed during the PEA surveys included common reed and perennial rye grass.
w1g	Other broadleaved woodland	1.3	Other broadleaved woodland was recorded 11 times across the survey area. Key species observed during the PEA surveys included: ash, aspen, beech, crack willow, Eastern balsam-poplar, grey poplar, evergreen oak, field maple, blackthorn, hawthorn, pedunculate oak, Scots pine, silver birch, and sycamore.
h2a5	Species-rich native hedgerow	1.27	Approximately 1.21km of species-rich native hedgerow was present within the Onshore Development Area. Key species observed during the PEA surveys included: hawthorn, blackthorn, bramble, common nettle, and hazel. This habitat is a subset of the priority habitat 'hedgerows' and is within the LBAP (East Riding of Yorkshire Council, 2010).

UKHab Habitat Code	UKHab Habitat	Length (km)	Habitat Description
r1e	Canals	0.83	All canals were within the Onshore Development Area. Key species observed during the PEA surveys included perennial rye grass and *Potomogeton spp*.
r1f	Temporary water bodies	0.83	This temporary water body consisted of one ditch. Key species observed during the PEA surveys included cock's foot.
u1c	Artificial unvegetated – unsealed surface	0.31	Land cleared for development, infrastructure construction or other purpose, currently unvegetated, but the soil surface is not sealed with impervious materials. Key species observed during the PEA surveys included perennial rye grass and pineapple weed.
u1b6	Other developed land	0.29	All other farm buildings which do not meet the definitions of u1b5 such modern agricultural buildings of steel construction, barn conversions and all other farm buildings. Key species observed during the PEA surveys included daisy *Bellis perennis*.
h2b	Non-native and ornamental hedgerow	0.2	This habitat consisted of one non-native and ornamental hedgerow. Key species observed during the PEA surveys included Leylan cypress *Cupressus x leylandii,* and hawthorn.
h2	Hedgerow	0.19	This hedgerow habitat consisted of two hedgerows, both within the survey area but neither within the Onshore Development Area. Key species observed during the PEA surveys included hawthorn and bramble. This is a priority habitat and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1	Broadleaved and mixed woodland	0.13	Approximately 0.09km of broadleaved and mixed woodland was within the Onshore Development Area. Key species observed during the PEA surveys included ash, *Salix spp.,* crack willow and sycamore. This habitat is a subset of the priority habitat 'broadleaved, mixed and yew woodland' and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1f	Lowland mixed deciduous woodland	0.08	All of the lowland mixed deciduous woodland was present within the Onshore Development Area. Key species observed during the PEA surveys included: ash, blackthorn, field maple, hawthorn, pedunculate oak, silver birch, and common nettle. This habitat is a subset of the priority habitat 'broadleaved, mixed and yew woodland' and is within the LBAP (East Riding of Yorkshire Council, 2010).
w1h5	Other woodland – mixed – mainly broadleaved	0.05	A mixture of broadleaved and coniferous trees in which broadleaf species make up 50-80% of tree cover. Key species observed during the PEA surveys included: beech, sycamore, and dog's mercury.

23.6.1.3.4 Biodiversity Net Gain

102. The value of each habitat type identified at baseline within the Onshore Development Area has been calculated using the Statutory Biodiversity Metric. This baseline information is available in full within **Volume 2, Appendix 23.5 Statutory Biodiversity Metric Calculator**.

103. It should be noted that the figures presented within **Volume 2, Appendix 23.5 Statutory Biodiversity Metric Calculator** only represent the habitats within the Onshore Development Area which have been subject to PEA surveys. Some areas of the Onshore Development Area remain unsurveyed and are therefore not represented within these figures. Surveys will be completed to inform the Outline BNG Strategy to be developed at ES stage and submitted with the DCO application (see Commitment ID CO82 in **Table 23-5**).

104. By way of summary, the value of the habitats surveyed within the Onshore Development Area have been calculated as:

- Habitat Units: 2324.23
- Hedgerow Units: 259.50
- Watercourse Units: 97.17

105. In terms of area, 91% of the 2,324.23 Habitat Units belong to 'very low' or 'low' distinctiveness habitat types, such as cropland and developed land. The remaining approximately 9% of habitats comprise 'medium' or 'high' distinctiveness habitats, such as field margins, and other neutral grassland.

106. By length, approximately 73% of the 259.50 Hedgerow Units comprise 'low' distinctiveness hedgerow types, such as species poor native hedgerows. The remaining approximately 27% comprise 'medium', high' or 'very high' distinctiveness hedgerows, such as species-rich native hedgerows.

107. By length, approximately 74% of the 97.17 Watercourse Units comprise 'medium' distinctiveness watercourses such as ditches. The remaining approximately 26% comprise 'high' distinctiveness watercourses.

23.6.1.3.5 Protected and Notable Species

108. This section provides a summary of the key species recorded within the Onshore Development Area, drawing information from the following sources:

- **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report;** and
- **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note.**

23.6.1.3.5.1 Amphibians, including Great Crested Newts

109. The desk study (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified 20 records of GCN *Triturus cristatus* within 2km of the Onshore Development Area, with the closest being 200m east of the Onshore Development Area (two ponds at NGR TA0376637160 and TA0379837130). No other amphibian species were recorded in the desk study.

110. Two GCN European Protected Species licence returns, both impacting destruction of a resting place, were granted between 2011 and 2015 within 2km of the Onshore Development Area, one was 0.3km south-west, and the other was 0.65km north-west.

111. The desk study identified 20 ponds within the Onshore Development Area (see **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**), and a further 107 within 250m of the boundary and a further 163 between 250m and 500m from the boundary (as detailed within **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**).

112. Ponds beyond 250m of the Onshore Development Area were scoped out of HSI surveys. Full justification for this decision is provided within **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note**.

113. As part of the PEA surveys, 110 ponds were visited, 16 of which were no longer existing or were not ponds. A further seven ponds were dry at the time of survey. A total of 42 ponds had HSI surveys completed, in line with Oldham *et al*. (2000). The results were:

- Two with 'excellent' suitability;
- Seven with 'good' suitability;
- Three with 'average' suitability;
- 17 with 'below average suitability'; and
- 13 with 'poor' suitability (including the seven ponds which were dry at the time of survey).

114. 45 of the ponds visited were not subject to HSI surveys due to access limitations. HSI surveys of the ponds not surveyed during the course of the 2024 will continue in 2025 alongside the continuation of PEA surveys. Full details of the surveys and the results are provided within **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note**.

115. The waterbodies identified through the desk study and field surveys are present throughout the Onshore Development Area, and within a 250m buffer area, with a high concentration of them to the south-west of OCS Zone 8.

116. In addition, the PEA surveys identified the presence of habitats and features which could be used for refugia and hibernacula by GCN and other amphibian species, including piles of bricks and dense vegetation.

117. GCN are a European Protected Species (EPS) which means they have full protection under The Conservation of Habitats and Species Regulations 2017. It's an offence to deliberately capture, injure or kill, or deliberately disturb EPS and therefore in accordance with the criteria set out in **Table 23-10**, they are of **high** importance.

118. Common toad is a priority species and therefore, is of **medium** importance.

119. Other species of amphibian which have the potential to be present within the Onshore Development Area include common frog *Rana temporaria,* palmate newt *Lissotriton helveticus* and smooth newt *Lissotriton vulgaris*. These species are not subject to specific legal protection or conservation objectives, however, they remain of intrinsic ecological interest and are therefore of **low** importance.

23.6.1.3.5.2 Badgers

120. The desk study (provided in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified two records of badger *Meles meles* within 2km of the Onshore Development Area. One of these records was a disused sett and one was a live sighting.

121. A preliminary search for signs of badgers, within the Onshore Development Area was undertaken concurrently with the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**). Signs such as setts, tracks, hairs, bedding and spoil heaps, snuffle holes and latrines were checked for. The PEA surveys found the following evidence of badger activity within the Onshore Development Area:

- One active badger sett;
- Two potential badger setts;
- Latrines;
- Badger faeces;
- Possible snuffle holes;
- Unconfirmed badger digging; and
- Mammal paths.

122. The Onshore Development Area provides suitable terrestrial habitat for sett creation and foraging, including but not limited to agricultural fields, woodlands and hedgerows. The full habitat survey results can be found in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report.**

123. Badgers are considered to be of **medium** importance, as they are legally protected at a national level, but are widespread throughout the county and are not classified as threatened or rare in East Riding of Yorkshire.

23.6.1.3.5.3 Bats

124. The desk study identified 13 records of bats within 2km of the Onshore Development Area across the following species:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *P. pygmaeus*;
- Pipistrelle (unidentified) *Pipistrellus sp.*;
- Myotis (unidentified) *Myotis sp.*; and
- Unidentified *Vesperidae sp*.

125. A total of 14 EPS licence returns relating to bats were granted within 2km to the Onshore Development Area. The closest record was located 400m west of the Onshore Development Area. This licence was for common pipistrelle, Natterer's bat *Myotis nattereri* and brown long-eared bat *Plecotus auritus*.

126. The Onshore Development Area provides habitats suitable for roosting bats, including wooded areas and lines of trees as well as man-made structures such as barns, sheds and other buildings. The Onshore Development Area also provides habitats suitable for foraging and commuting bats, including hedgerows, woodland and ponds.

127. All bat species are protected as EPS and are therefore deemed to be of **high** importance.

23.6.1.3.5.4 Fish

128. The desk study identified 61 records of protected or notable fish within 2km of the Onshore Development Area including records of European eel *Anguilla anguilla*, bullhead *Cottus gobio*, lamprey species and brown / sea trout *Salmo trutta*. All but bullhead are classed as priority species.

129. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) found multiple watercourses that intersect the Onshore Development Area and could be suitable for a variety of fish species.

130. In absence of further data, it is assumed that the fish populations present are of **high** importance.

23.6.1.3.5.5 Invertebrates

131. No records of white-clawed crayfish were found within 2km of the Onshore Development Area, and the PEA surveys found their presence to be unlikely.

132. The desk study identified 11,190 records of invertebrates of 257 taxa within 2km of the Onshore Development Area, none of which were protected species.

133. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) found there to be refugia and standing deadwood within the Onshore Development Area, which could provide suitable habitat for protected terrestrial invertebrates, as well as woodland and hedgerows. There were also networks of ditches and ponds present on the site, which could provide suitable habitat for freshwater invertebrates.

134. The following protected invertebrates were identified during the PEA surveys:

- Cinnabar moth caterpillar *Tyria jacobaeae;*
- Butterflies;
- Dragonflies;
- Damselflies; and
- Ladybirds with pupae.

135. Due to the presence of priority invertebrate species amongst the assemblage, invertebrates are assumed to be of **high** importance.

23.6.1.3.5.6 Otter

136. The desk study identified six records of otter within 2km of the Onshore Development Area, the closest being recorded 760m to the south-east of the Onshore Development Area.

137. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) found there to be watercourses and ponds within the Onshore Development Area which could provide suitable habitat for otters, but no evidence of otter activity was recorded. A list of the watercourses can be found within **Chapter 21 Water Resources and Flood Risk**.

138. The network of ditches present within the Onshore Development Area could be suitable for the creation of otter holt, as could the larger watercourses. The locations of the network of ditches present within the Onshore Development Area can be found within **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note**.

139. The larger watercourses and streams within the Onshore Development Area such as River Hull, Aike Beck Diversion, Roam Drain, Mickley Dike, Stream Dike, Scorborough Beck, Bealey's Beck, and Whitewater Drain will likely provide greater suitability for otter holt creation, and other activities such as resting places and foraging, than the smaller ditches and ditch network.

140. Large ponds could also be used by otter for holt creation, and other activities such as resting places and foraging.

141. Otters are protected as EPS and are therefore of **high** importance.

23.6.1.3.5.7 Reptiles

142. The desk study identified two records of reptiles within 2km of the Onshore Development Area, both were grass snake.

143. The Onshore Development Area is dominated by agricultural habitats which are in active use and provide low suitability for reptiles. However, the grassland, woodland and hedgerows within the Onshore Development Area could provide high suitability habitat for reptiles, although no reptiles were recorded during the PEA surveys. Further details of the habitats can be found in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**.

144. Any reptile species that may be using the Onshore Development Area would be deemed of **medium** importance. The EPS sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* have been excluded from assessment due to their southern ranges, meaning that they are likely to be absent from the Onshore Development Area which falls outside of their ranges. However, common lizard, slow-worm, grass snake and adder could be present within the habitats within the Onshore Development Area.

23.6.1.3.5.8 Water Voles

145. The desk study identified two records of water vole *Arvicola amphibius* within 2km of the Onshore Development Area, the closest record being located 1.4km north-east of the boundary.

146. During the PEA surveys, a network of ditches were identified which could provide suitable habitat for water vole burrow creation, although no signs of water vole were recorded. The full habitat survey results can be found in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**.

147. Water vole is considered to be of **high** importance as an EPS.

23.6.1.3.5.9 Other Protected and Notable Species

148. The desk study identified 11 records of brown hare *Lepus europaeus* and 123 records of European hedgehog *Erinaceus europaeus* within 2km of the Onshore Development Area.

149. Brown hares were recorded during the PEA surveys over multiple locations, mainly within the arable fields of the Onshore Development Area. Brown hare is considered to be of **medium** importance.

150. Hedgehogs were not recorded during the PEA surveys, however the Onshore Development Area contains multiple suitable habitats, such as woodland, hedgerows, scrub and grassland. The full habitat survey results can be found in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**.

23.6.1.3.5.10 Overwintering and Passage Birds

151. The East Riding of Yorkshire comprises a range of temperate habitats used for overwintering by both resident bird species (present throughout the year) and birds which migrate to the region for their non-breeding or wintering period of the annual cycle. It is also situated on the East Atlantic Flyway, and its habitats are used by passage birds migrating through the area during the spring (pre-breeding) and / or autumn (post-breeding) migration periods.

152. The bird species recorded in the Onshore Ornithology Desk Study Area during the overwintering and / or passage months (defined by Natural England DAS as August to mid-May inclusive) across the NEYEDC, eBird and Dogger Bank South data sources are reported in **Table 23-21.** A total of 163 species are reported from the onshore ornithology desk Study Area, including 114 species listed as BoCC5 amber or red status or as a WCA (1981) Schedule 1 bird.

153. The Onshore Ornithology Desk Study Area hosts a wide diversity of overwintering and passage bird species based on the combined assemblage of species recorded within the three desk-based datasets accessed. This indicates appreciable quality and diversity of habitat in the proximity to the Onshore Development Area (here defined as within 2km of its boundary). Many of the records of scarce waterbirds and passage terrestrial bird species originate from Tophill Low SSSI and other sites of special scientific or ecological interest in the locality, where wet or insect-rich habitats are more prevalent than in conventional drained and improved agricultural land. The complement of species recorded by Dogger Bank South surveys in winter 2022/23, which focused on a similar composition of habitats to that within the Onshore Development Area, comprises a subset of 94 relatively generalist and typical farmland and wetland bird species. This subset of the 163 species reported from the desk study are those likely to occur within the Onshore Development Area or immediately adjacent, with many of the waterbird or wetland species only likely to occur in the small proportion of the Onshore Development Area where such habitats are found.

Table 23-21 Occurrence in the Onshore Ornithology Desk Study Area of Overwintering and Passage Bird Species

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Avocet	BoCC amber				X		
Barn owl	Sched 1	X	X	2021	X	X	4
Barnacle goose	BoCC amber				X		
Bewick's swan	BoCC red				X		
Bittern	BoCC amber				X		
Black redstart	BoCC amber		X	2014			
Black-headed gull	BoCC amber	X	X	2017	X	X	455
Black-necked grebe	BoCC amber				X		
Black-tailed godwit	BoCC red				X		
Bullfinch	BoCC amber		X	2018	X	X	10
Cattle egret	BoCC amber				X		
Cetti's warbler	Sched 1		X	2023	X	X	2
Common gull	BoCC addendum on status of seabirds red	X	X	2023	X	X	1,699
Common sandpiper	BoCC amber				X		
Common scoter	BoCC red				X		
Common tern	BoCC amber				X		
Corn bunting	BoCC red				X	X	4
Cuckoo	BoCC red				X		
Curlew	BoCC red		X	2018	X	X	14

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Dunlin	BoCC red				X		
Dunnock	BoCC amber		X	2024	X	X	114
Eider	BoCC amber				X		
Fieldfare	BoCC red		X	2016	X	X	893
Gadwall	BoCC amber		X	2018	X	X	6
Garganey	BoCC amber		X	2019	X		
Golden plover	Annex I		X	2015	X	X	333
Goldeneye	BoCC red		X	2018	X	X	6
Grasshopper warbler	BoCC red		X	2012			
Great black-backed gull	BoCC addendum on status of seabirds red				X	X	35*
Great white egret	BoCC amber		X	2019	X	X	1
Green sandpiper	BoCC amber		X	2017	X	X	4
Greenfinch	BoCC red		X	2024	X	X	41
Greenshank	BoCC amber				X		
Grey partridge	BoCC red	X	X	2020	X	X	70
Grey wagtail	BoCC amber		X	2019	X	X	2
Greylag goose	BoCC amber				X	X	104
Hen harrier	BoCC red		X	2015	X		
Herring gull	BoCC red		X	2007	X	X	650
Hobby	Sched 1		X	2012	X		

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
House martin	BoCC red		X	2009	X		
House sparrow	BoCC red	X	X	2024	X	X	31
Kestrel	BoCC amber	X	X	2020	X	X	27
Kingfisher	Sched 1, BoCC amber		X	2021	X	X	8
Kittiwake	BoCC red				X		
Knot	BoCC amber				X		
Lapwing	BoCC red	X	X	2023	X	X	716
Lesser black-backed gull	BoCC amber					X	1
Lesser redpoll	BoCC red				X	X	3
Linnet	BoCC red	X	X	2018	X	X	362
Little ringed plover	Sched 1		X	2023	X		
Mallard	BoCC amber	X	X	2011	X	X	96
Marsh harrier	Sched 1, BoCC amber		X	2023	X	X	4
Marsh tit	BoCC red	X	X	2020	X	X	1
Meadow pipit	BoCC amber		X	2009	X	X	117
Mediterranean gull	BoCC amber				X		
Merlin	BoCC red				X		
Mistle thrush	BoCC red	X	X	2021	X	X	13
Moorhen	BoCC amber	X	X	2019	X	X	20
Mute swan	BoCC amber		X	2011	X	X	17
Nightjar	BoCC amber				X		

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Oystercatcher	BoCC amber		X	2021	X		(intertidal only)
Peregrine	Sched 1		X	2020	X	X	3
Pied flycatcher	BoCC amber				X		
Pink-footed goose	BoCC amber	(flight only)	X	2021	X	X	447
Pintail	BoCC amber				X		
Pochard	BoCC red		X	2009	X		
Quail	BoCC amber				X		
Red kite	Sched 1				X	X	3
Red-breasted merganser	BoCC amber				X		
Red-necked grebe	BoCC red		X	2019	X		
Red-throated diver	Annex I				X		
Redshank	BoCC amber		X	2018	X	X	17*
Redwing	BoCC amber				X	X	787
Reed bunting	BoCC amber	X	X	2020	X	X	121
Ring ouzel	BoCC red		X	2020			
Ringed plover	BoCC red				X		
Rook	BoCC amber		X	2016	X	X	653
Ruff	BoCC amber		X	2015	X	X	2
Scaup	BoCC red				X		
Sedge warbler	BoCC amber				X		
Shelduck	BoCC amber		X	2023	X		

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Short-eared owl	BoCC amber					X	1
Shoveler	BoCC amber		X	2018	X	X	5
Skylark	BoCC red	X	X	2020	X	X	544
Slavonian grebe	BoCC red				X		
Smew	BoCC red				X		
Snipe	BoCC amber		X	2015	X	X	42
Song thrush	BoCC amber	X	X	2015	X	X	64
Sparrowhawk	BoCC amber		X	2020	X	X	15**
Spoonbill	BoCC amber				X		
Spotted flycatcher	BoCC red				X		
Spotted redshank	BoCC amber				X		
Starling	BoCC red		X	2024	X	X	672
Stock dove	BoCC amber		X	2022	X	X	151
Swift	BoCC red		X	2016	X		
Tawny owl	BoCC amber		X	2019	X	X	2
Teal	BoCC amber		X	2019		X	148
Tree sparrow	BoCC red		X	2017	X	X	52
Turnstone	BoCC amber				X		
Wheatear	BoCC amber		X	2016	X		
Whimbrel	BoCC red		X	2018			
Whinchat	BoCC red				X		

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
White-fronted goose	BoCC red				X		
Whitethroat	BoCC amber		X	2017	X		
Whooper swan	BoCC amber		(flight only)	2017	X		
Wigeon	BoCC amber		X	2018	X	X	547
Willow tit	BoCC red		X	2012	X		
Willow warbler	BoCC amber		X	2009	X		
Wood sandpiper	BoCC amber				X		
Woodcock	BoCC red		X	2018	X	X	9
Woodpigeon	BoCC amber	X	X	2024	X	X	2,955
Wren	BoCC amber	X	X	2017	X	X	114
Yellow wagtail	BoCC red		X	2016	X		
Yellowhammer	BoCC red	X	X	2024	X	X	203
Bearded tit	BoCC green				X		
Blackbird	BoCC green	X	X	2024	X	X	**288**
Blackcap	BoCC green				X	X	**9**
Blue tit	BoCC green		X	2021	X	X	**167**
Brambling	BoCC green				X	X	**1**
Buzzard	BoCC green	(flight only)	X	2023	X	X	**34**
Carrion crow	BoCC green	X	X	2016	X	X	**209**
Chaffinch	BoCC green				X	X	**311**
Chiffchaff	BoCC green				X	X	**5**

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Coal tit	BoCC green				X	X	**12**
Collared dove	BoCC green		X	2023	X	X	**53**
Coot	BoCC green				X	X	3
Cormorant	BoCC green				X	X	46*
Crossbill	BoCC green				X		
Feral pigeon	BoCC green		X	1988	X	X	**6**
Firecrest	BoCC green				X		
Garden warbler	BoCC green				X		
Goldcrest	BoCC green	X	X	2020	X	X	**36**
Goldfinch	BoCC green		X	2011	X	X	**204**
Goosander	BoCC green		X	2018	X		
Great crested grebe	BoCC green				X		(intertidal only)
Great spotted woodpecker	BoCC green	X	X	2016	X	X	**22**
Great tit	BoCC green		X	2017	X	X	**75**
Green woodpecker	BoCC green	X	X	2018	X	X	**3**
Grey heron	BoCC green				X	X	6
Jack snipe	BoCC green				X	X	1
Jackdaw	BoCC green		X	2011	X	X	**97**
Jay	BoCC green		X	2015	X	X	**6**
Lesser whitethroat	BoCC green				X		
Little egret	BoCC green		X	2020	X	X	10

Species	Conservation Status	NEYEDC Data			eBird (2019-2024)	Dogger Bank South Wintering Surveys (2022 / 23)	
		Onshore Development Area (X)	Onshore Development Area + Buffer (X)	Most Recent Year	Present (X)	Present (X)	Sum of Transect Peak Counts
Little grebe	BoCC green				X	X	1
Little gull	BoCC green				X		
Little owl	Not assessed	X	X	2018	X		
Long-tailed tit	BoCC green				X	X	**60**
Magpie	BoCC green		X	2011	X	X	**68**
Nuthatch	BoCC green				X	X	**1**
Pheasant	BoCC green				X	X	**71**
Pied wagtail	BoCC green		X	2014	X	X	**49**
Raven	BoCC green				X		
Red-legged partridge	BoCC green				X	X	**60**
Reed warbler	BoCC green				X		
Robin	BoCC green	X	X	2024	X	X	**217**
Sand martin	BoCC green				X		
Siskin	BoCC green		X	2018	X	X	**3**
Stonechat	BoCC green				X	X	**4**
Swallow	BoCC green		X	2016	X	X	**6**
Treecreeper	BoCC green		X	2008	X	X	**10**
Tufted duck	BoCC green		X	2020	X		
Water rail	BoCC green				X	X	2

*includes intertidal zone individuals.

**includes uncharacteristic record of 9 birds together

154. Site-specific transect surveys from August to December 2024 of overwintering and passage birds in the Onshore Development Area recorded 105 species, and diurnal and nocturnal vantage point surveys during the same period recorded an additional five species not recorded in transect surveys (**Table 23-22**). Of this total of 110 species, 69 species are BoCC5 red or amber listed and/or are listed on Schedule 1 of the WCA or Annex I of the Birds Directive. The species and peak counts recorded are highly concordant with those of the desk study. The species recorded not contained in the desk study data are yellow-browed warbler and long-eared owl (though the latter is classed as sensitive by both eBird and the BTO and the species' occurrence is reported only at county level). Survey data includes species and individuals flying over the survey transect or vantage point and not utilising habitat of the Onshore Development Area.

Table 23-22 Overwintering and Passage Bird Species Recorded in the Onshore Development Area (August to December 2024), with Summed Peak Counts across Transects as an Indication of Population

Species	Sum of Transect Peak Counts
BoCC5 red/amber, Schedule 1 and Annex 1 species	
Bullfinch	12
Black-headed gull	654
Barn Owl	0 (species was recorded in VP surveys)
Corn Bunting	28
Common gull	3,083
Cetti's warbler	2
Caspian gull	1
Dunnock	31
Cattle egret	3
Fieldfare	313
Gadwall	2
Great black backed gull	44
Green sandpiper	14
Greylag goose	256
Grey wagtail	7
Golden plover	1,392
Greenfinch	15
Herring gull	389
House martin	50
House sparrow	62
Great white egret	5
Hobby	0 (species was recorded in VP surveys)
Kestrel	19
Kingfisher	2
Red kite	12
Lapwing	1,680
Lesser black backed gull	41
Linnet	817
Lesser redpoll	1
Lesser Whitethroat	1
Mistle thrush	17
Mallard	97
Moorhen	15
Merlin	1
Meadow pipit	110
Marsh harrier	6
Marsh tit	3

Species	Sum of Transect Peak Counts
Oystercatcher	14
Grey partridge	50
Peregrine	2
Pink-footed goose	6,935
Reed bunting	69
Redwing	338
Rook	1,012
Ringed plover	3
Skylark	347
Stock dove	122
Spotted flycatcher	1
Starling	2,562
Sparrowhawk	6
Swift	62
Snipe	15
Song thrush	33
Sedge warbler	4
Teal	65
Tawny owl	0 (species was recorded in VP surveys)
Tree sparrow	171
Wheatear	1
Whinchat	1
Woodcock	1

Species	Sum of Transect Peak Counts
Whitethroat	5
Whimbrel	0 (species was recorded in VP surveys)
Woodpigeon	3748
Wren	54
Whooper swan	25
Willow warbler	5
Yellowhammer	172
Yellow-browed warbler	1
Yellow wagtail	15
BoCC green listed or unassessed species	
Blackbird	121
Blue tit	48
Brambling	1
Buzzard	40
Carrion crow	873
Cormorant	30
Chiffchaff	22
Collared dove	61
Canada goose	169
Chaffinch	152
Coot	29
Coal tit	17
Egyptian goose	1

Species	Sum of Transect Peak Counts
Little egret	10
Feral pigeon	8
Green woodpecker	2
Goldcrest	11
Great crested grebe	1
Goldfinch	139
Great spotted woodpecker	6
Great tit	17
Garden warbler	1
Grey heron	18
Jay	24
Jackdaw	699
Long eared owl	0 (species recorded in VP surveys)
Little grebe	1
Long-tailed tit	74
Magpie	63
Mute swan	58
Pheasant	103
Pied wagtail	70
Robin	87
Red legged partridge	139
Raven	3
Stonechat	1
Siskin	2
Swallow	154
Sand martin	7
Treecreeper	3
Tufted duck	15

23.6.1.3.5.10.1. OCS Zones

155. The bird species recorded in OCS Zone 4 during Dogger Bank South surveys is reported in **Table 23-23**. The desk and survey data also includes records of birds flying over only and which are not utilising the habitat within OCS Zone 4.

156. The desk data indicate that the overwintering and passage bird assemblage of OCS Zone 4 is typical of arable farmland habitat in the region and comprises species occurring in numbers that are of low significance or at most local significance. Notable species recorded are marsh harrier which was recorded on one visit (a single juvenile in December 2022) and peregrine which was recorded on two visits (a pair in December 2022 and a single bird in March 2023). However, both species were recorded as flying over only.

Table 23-23 Occurrence in OCS Zone 4 of Overwintering and Passage Bird Species During Dogger Bank South Surveys (November 2022 to May 2023 + August 2023)

Species	Conservation Status	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Aug 23	Peak Count
Black-headed gull	BoCC amber	61	42	1	1	0	0	0	2	61
Bullfinch	BoCC amber	1	0	0	0	0	1	0	0	1
Common gull	BoCC addendum on status of seabirds red	65	21	2	1	0	0	0	48	65
Curlew	BoCC red	0	0	0	0	0	0	0	1	1

Species	Conservation Status	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Aug 23	Peak Count
Dunnock	BoCC amber	5	1	4	1	1	7	3	2	7
Fieldfare	BoCC red	25	36	0	4	21	0	0	0	36
Greenfinch	BoCC red	0	0	0	1	0	1	0	8	8
Grey partridge	BoCC red	0	0	0	0	4	0	0	3	4
Herring gull	BoCC red	0	0	0	0	0	4	0	0	4
House martin	BoCC red	5	2	4	0	0	0	7	51	51
House sparrow	BoCC red	0	0	0	0	0	0	0	3	3
Kestrel	BoCC amber	0	6	0	0	14	1	3	0	14
Lapwing	BoCC red	0	0	0	1	0	1	0	0	1
Lesser black-backed gull	BoCC amber	0	0	0	0	0	0	1	12	12
Linnet	BoCC red	68	0	30	2	3	5	2	0	68
Mallard	BoCC amber	0	0	0	0	0	0	2	0	2
Marsh harrier	Sched 1, BoCC amber	0	1	0	0	0	0	0	0	1
Meadow pipit	BoCC amber	1	0	7	0	0	1	0	0	7
Mistle thrush	BoCC red	0	2	0	0	0	2	0	0	2
Peregrine	Sched 1	0	2	0	0	1	0	0	0	2
Redwing	BoCC amber	65	67	30	38	12	0	0	0	67
Reed bunting	BoCC amber	0	0	0	0	2	1	0	0	2
Rook	BoCC amber	0	34	0	7	0	47	38	51	51
Skylark	BoCC red	1	3	0	6	7	7	11	5	11
Song thrush	BoCC amber	7	1	1	11	0	1	3	0	11
Sparrowhawk	BoCC amber	0	1	1	0	0	0	0	0	1

Species	Conservation Status	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Aug 23	Peak Count
Starling	BoCC red	0	0	0	0	8	0	19	0	19
Stock dove	BoCC amber	0	6	0	1	1	5	3	2	6
Tree sparrow	BoCC red	0	0	0	0	0	0	1	1	1
Whitethroat	BoCC amber	0	0	0	0	0	0	4	0	4
Willow warbler	BoCC amber	0	0	0	0	0	0	0	4	4
Woodpigeon	BoCC amber	298	137	275	507	355	206	31	34	507
Wren	BoCC amber	6	4	6	6	9	12	12	9	12
Yellow wagtail	BoCC red	0	0	0	0	0	0	1	2	2
Yellowhammer	BoCC red	0	2	0	0	0	2	5	0	5
Blackbird	BoCC green	31	28	15	9	19	6	14	9	31
Blackcap	BoCC green	0	0	0	0	0	1	5	1	5
Blue tit	BoCC green	5	3	2	3	1	4	3	11	11
Buzzard	BoCC green	0	0	0	0	1	0	0	2	2
Carrion crow	BoCC green	6	2	5	4	4	5	4	2	6
Chaffinch	BoCC green	5	3	4	9	11	7	9	12	12
Chiffchaff	BoCC green	0	0	0	0	0	1	1	1	1
Collared dove	BoCC green	1	0	0	5	1	1	1	3	5
Goldcrest	BoCC green	2	0	0	0	0	0	1	1	2
Goldfinch	BoCC green	1	1	13	9	8	3	1	0	13
Great spotted woodpecker	BoCC green	1	0	0	0	0	0	2	0	2
Great tit	BoCC green	2	1	2	6	1	7	2	3	7
Green woodpecker	BoCC green	0	0	1	0	0	2	0	0	2

Species	Conservation Status	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Aug 23	Peak Count
Jackdaw	BoCC green	0	7	0	3	0	4	0	0	7
Long-tailed tit	BoCC green	12	0	3	0	5	0	0	1	12
Magpie	BoCC green	3	2	2	4	2	4	3	2	4
Pheasant	BoCC green	1	0	0	6	1	0	3	3	6
Pied wagtail	BoCC green	2	0	0	0	0	0	0	0	2
Red-legged partridge	BoCC green	0	10	0	7	0	1	0	0	10
Robin	BoCC green	16	10	7	13	4	11	10	11	16
Swallow	BoCC green	0	0	0	0	0	0	5	1	5

157. The bird species recorded in OCS Zone 8 by BTO Birdtrack and Dogger Bank South survey visit 1 (prior to a change in transect route) are reported in **Table 23-24**. The desk and survey data also includes birds flying over only and not utilising the habitat within OCS Zone 8.

158. The desk data indicate that the overwintering and passage bird assemblage of OCS Zone 8 is typical of arable farmland habitat in the region and comprises species occurring in numbers that are of low significance or at most local significance. Notable species recorded are barn owl and marsh tit.

Table 23-24 Occurrence in OCS Zone 8 Of Overwintering and Passage Bird Species (BTO Birdtrack: Risby Estate, Ebird: Risby Park, Dogger Bank South Survey October 2022)

Species	Conservation Status	BTO Birdtrack 2019-24 (Present = X)	eBird Aug 2024 (Present = X)	Dogger Bank South Oct 2022 (Present = X)	Peak Count
Barn owl	Sched 1	X			3
Black-headed gull	BoCC amber	X	X	X	105
Bullfinch	BoCC amber	X			1
Common gull	BoCC			X	139
	addendum red				
Dunnock	BoCC amber	X		X	4
Fieldfare	BoCC red	X			Present
Greenfinch	BoCC red	X			Present
Grey partridge	BoCC red	X		X	5
Greylag goose	BoCC amber	X			8
Herring gull	BoCC red	X		X	12
House sparrow	BoCC red	X			3
Kestrel	BoCC amber	X			1
Lapwing	BoCC red	X			1
Lesser black-backed gull	BoCC amber	X	X		3
Linnet	BoCC red	X		X	60
Mallard	BoCC amber	X			10
Marsh tit	BoCC red	X			1
Marsh / willow tit	BoCC red	X			1
Mistle thrush	BoCC red	X			1
Moorhen	BoCC amber	X	X		6
Redwing	BoCC amber	X			Present
Reed bunting	BoCC amber			X	1
Rook	BoCC amber	X		X	31
Skylark	BoCC red	X		X	15
Song thrush	BoCC amber	X		X	1

Species	Conservation Status	BTO Birdtrack 2019-24 (Present = X)	eBird Aug 2024 (Present = X)	Dogger Bank South Oct 2022 (Present = X)	Peak Count
Sparrowhawk	BoCC amber			X	1
Starling	BoCC red	X		X	15
Stock dove	BoCC amber	X	X		1
Tree sparrow	BoCC red	X			5
Whitethroat	BoCC amber	X			3
Willow warbler	BoCC amber	X			4
Woodpigeon	BoCC amber	X	X	X	8
Wren	BoCC amber	X	X	X	2
Yellowhammer	BoCC red	X		X	41
Blackbird	BoCC green	X		X	2
Blackcap	BoCC green	X			8
Blue tit	BoCC green	X		X	6
Buzzard	BoCC green	X	X	X	3
Carrion crow	BoCC green	X		X	4
Chaffinch	BoCC green	X		X	7
Chiffchaff	BoCC green	X			5
Coal tit	BoCC green	X			2
Collared dove	BoCC green	X			Present
Cormorant	BoCC green	X			1
Feral pigeon	BoCC green	X			Present
Goldcrest	BoCC green			X	1
Goldfinch	BoCC green	X		X	9
Great spotted woodpecker	BoCC green	X			1
Great tit	BoCC green	X			2
Green woodpecker	BoCC green	X		X	2
Jackdaw	BoCC green	X	X	X	19
Jay	BoCC green			X	1
Long-tailed tit	BoCC green	X			1
Magpie	BoCC green	X		X	2
Pheasant	BoCC green	X		X	6
Red-legged partridge	BoCC green	X		X	1
Robin	BoCC green	X		X	5
Swallow	BoCC green	X	X		3
Treecreeper	BoCC green	X		X	1
Tufted duck	BoCC green	X			1

159. Site-specific transect surveys from August to December 2024 of overwintering and passage birds in the OCS zones and their immediate surrounds recorded 64 species (**Table 23-25**). Diurnal vantage point surveys from August to December 2024 of the OCS zones, recorded two additional species not recorded in transect surveys: whooper swan and peregrine. Of this total of 66 species, 39 are BoCC5 red or amber listed, and/or are listed on Schedule 1 of the WCA or Annex I of the Birds Directive. The species and peak counts reported cover both OCS zones together, plus adjoining areas of similar habitat through which the transect also passed, so can be expected to include higher peak counts of some species than reported from desk-based data for the two OCS zones above.

Table 23-25 Overwintering and Passage Bird Species and Peak Counts Recorded in the OCS Zones (August to December 2024)

Species	Peak Count
BoCC5 red/amber, Schedule 1 and Annex 1 species	
Bullfinch	4
Black-headed gull	321
Common gull	585
Dunnock	7
Fieldfare	27
Greylag goose	10
Grey wagtail	1
Golden plover	62
Greenfinch	1
Herring gull	33
House martin	4
House sparrow	15
Kestrel	1
Red kite	1
Lapwing	34
Lesser black backed gull	2
Linnet	78
Mistle thrush	3
Mallard	28
Moorhen	3
Meadow pipit	3
Marsh tit	3
Grey partridge	11
Peregrine	0 (VP surveys only)
Pink-footed goose	640
Reed bunting	2
Redwing	17
Rook	208
Skylark	20
Stock dove	6
Starling	360
Snipe	1
Song thrush	4
Woodcock	1
Woodpigeon	289
Wren	6
Whooper swan	0 (VP surveys only)
Willow warbler	2
Yellowhammer	3
BoCC5 green listed or unassessed species	
Blackbird	10
Blue tit	12
Buzzard	4

Species	Peak Count
Carrion crow	138
Cormorant	20
Chiffchaff	8
Collared dove	47
Chaffinch	9
Coal tit	2
Feral pigeon	8
Green woodpecker	1
Goldcrest	2
Goldfinch	37
Great spotted woodpecker	3
Great tit	5
Grey heron	3
Jay	3
Jackdaw	71
Long-tailed tit	29
Magpie	7
Pheasant	13
Pied wagtail	27
Robin	17
Red legged partridge	25
Raven	1
Swallow	25
Treecreeper	2

23.6.1.3.5.10.2. Landfall

160. The existing baseline of overwintering and passage bird species at the landfall is established via a targeted desk study as reported in **Volume 2, Appendix 13.5 Intertidal Ornithology Baseline Characterisation Report**. Bird species indicated to occur in significant numbers during overwintering and passage periods at the landfall included red-throated diver, common scoter, little gull and tern species, all of which are features of the Greater Wash SPA which overlies the landfall below the MHWS. Sanderling and whimbrel were also identified as potentially occurring regularly in significant numbers at the landfall. No overwintering or passage terrestrial species or 'landbirds' were identified as potential onshore or intertidal receptors. Therefore, all overwintering and passage bird species identified for further assessment for effects at the landfall are assessed in **Chapter 13 Offshore and Intertidal Ornithology**.

23.6.1.3.5.11 Breeding Birds

161. The desk-study of bird data across desk-based sources identified a total of 81 breeding bird species with possible, probable or confirmed breeding status within the Onshore Development Area or surrounding 2km buffer zone in the period 2020 to 2024 (**Table 23-26**). This included one Schedule 1 species breeding inside the Onshore Development Area, barn owl. The wider Onshore Ornithology Desk Study Area has confirmed breeding records since 2019 of little ringed plover and marsh harrier, and evidence of probable and possible breeding by kingfisher, Cetti's warbler, bittern and hobby. A hobby pair with two fledged young was recorded adjacent to the Onshore Development Area in 2012.

Table 23-26 Occurrence in the Onshore Ornithology Desk Study Area of Breeding Bird Species and Breeding Evidence / Status, 2020-2024, Plus Additional Schedule 1 or Confirmed / Probable Species Recorded 2014-2019 and Notable Records Pre-2014

Species	Max Breeding Status (Source)
2020-2024	
Barn owl (Sched 1)	Confirmed in Onshore Development Area (Dogger Bank South), and outside Onshore Development Area (NEYEDC)
Little ringed plover (Sched 1)	Confirmed outside Onshore Development Area (NEYEDC, eBird)

Species	Max Breeding Status (Source)
Marsh harrier (Sched 1)	Confirmed outside Onshore Development Area (eBird, Dogger Bank South)
Cetti's warbler (Sched 1)	Probable outside Onshore Development Area (eBird)
Kingfisher (Sched 1)	Probable outside Onshore Development Area (eBird)
Blue-winged teal (RBBP)	Probable outside Onshore Development Area (eBird)
Bittern (Sched 1)	Possible outside Onshore Development Area (eBird)
Hobby (Sched 1)	Possible outside Onshore Development Area (Dogger Bank South)
Black-headed gull	Confirmed (eBird)
Blackbird	Confirmed (eBird, Dogger Bank South)
Blackcap	Confirmed (eBird, Dogger Bank South)
Blue tit	Confirmed (eBird, Dogger Bank South)
Buzzard	Confirmed (Dogger Bank South)
Carrion crow	Confirmed (eBird, Dogger Bank South)
Chaffinch	Confirmed (Dogger Bank South)
Chiffchaff	Confirmed (Dogger Bank South)
Coal tit	Confirmed (Dogger Bank South)
Coot	Confirmed (eBird)
Dunnock	Confirmed (eBird, Dogger Bank South)
Gadwall	Confirmed (eBird, Dogger Bank South)
Garden warbler	Confirmed (eBird)
Goldfinch	Confirmed (eBird, Dogger Bank South)
Goldcrest	Confirmed (Dogger Bank South)
Great spotted woodpecker	Confirmed (eBird, Dogger Bank South)
Great tit	Confirmed (eBird, Dogger Bank South)

Species	Max Breeding Status (Source)
Greenfinch	Confirmed (Dogger Bank South)
House martin	Confirmed (BTO Birdtrack)
Jackdaw	Confirmed (Dogger Bank South)
Kestrel	Confirmed (Dogger Bank South)
Lapwing	Confirmed (Dogger Bank South)
Lesser whitethroat	Confirmed (eBird)
Linnet	Confirmed (Dogger Bank South)
Long-tailed tit	Confirmed (eBird, Dogger Bank South)
Magpie	Confirmed (eBird, Dogger Bank South)
Mallard	Confirmed (Dogger Bank South)
Meadow pipit	Confirmed (Dogger Bank South)
Moorhen	Confirmed (eBird, Dogger Bank South)
Mute swan	Confirmed (eBird)
Oystercatcher	Confirmed (eBird)
Pheasant	Confirmed (Dogger Bank South)
Pied wagtail	Confirmed (eBird, Dogger Bank South)
Red-legged partridge	Confirmed (Dogger Bank South)
Reed bunting	Confirmed (eBird, Dogger Bank South)
Reed warbler	Confirmed (eBird)
Robin	Confirmed (eBird, Dogger Bank South)
Rook	Confirmed (Dogger Bank South)
Sand martin	Confirmed (eBird, Dogger Bank South)
Sedge warbler	Confirmed (eBird)

Species	Max Breeding Status (Source)
Skylark	Confirmed (Dogger Bank South)
Song thrush	Confirmed (Dogger Bank South)
Sparrowhawk	Confirmed (Dogger Bank South)
Starling	Confirmed (Dogger Bank South)
Swallow	Confirmed (eBird, Dogger Bank South)
Tree sparrow	Confirmed (eBird, Dogger Bank South)
Tufted duck	Confirmed (eBird)
Whitethroat	Confirmed (eBird, Dogger Bank South)
Willow warbler	Confirmed (eBird)
Woodpigeon	Confirmed (eBird, Dogger Bank South)
Wren	Confirmed (eBird, Dogger Bank South)
Yellowhammer	Confirmed (Dogger Bank South)
Yellow wagtail	Confirmed (Dogger Bank South)
Collared dove	Probable (Dogger Bank South)
Great crested grebe	Probable (eBird)
Green woodpecker	Probable (Dogger Bank South)
Grey partridge	Probable (Dogger Bank South)
Greylag goose	Probable (Dogger Bank South)
House sparrow	Probable (eBird, Dogger Bank South)
Mistle thrush	Probable (Dogger Bank South)
Red-crested pochard	Probable (eBird)
Shoveler	Probable (Dogger Bank South)
Stock dove	Probable (eBird, Dogger Bank South)
Teal	Probable (Dogger Bank South)
Wigeon	Probable (Dogger Bank South)
Canada goose	Possible (Dogger Bank South)
Jay	Possible (Dogger Bank South)
Marsh tit	Possible (Dogger Bank South)
Nuthatch	Possible (Dogger Bank South)
Siskin	Possible (Dogger Bank South)
Tawny owl	Possible (eBird, Dogger Bank South)
Treecreeper	Possible (Dogger Bank South)
Water rail	Possible (eBird)
Additional Schedule 1, Confirmed or Probable Species 2014-2019 only	
Goldeneye (Sched 1)	Probable outside Onshore Development Area (eBird)
Red kite (Sched 1)	Observed / Flyover only inside Onshore Development Area (eBird, BTO Birdtrack)
Shelduck	Probable (eBird)
Pre-2014 Notable Records	
Hobby (Sched 1)	Confirmed adjacent to Onshore Development Area (NEYEDC)

162. The desk-study of breeding birds in OCS Zone 4 from Dogger Bank South surveys identified 43 breeding bird species with possible, probable or confirmed breeding status, and a further nine species considered to be non-breeding individuals only (i.e. over-summering or still migrating when recorded) (**Table 23-27**). Schedule 1 species included evidence of possible breeding by barn owl. All other Schedule 1 species recorded were considered to be non-breeding – peregrine, redwing and fieldfare.

Table 23-27 Occurrence in OCS Zone 4 of Breeding Bird Species and Breeding Evidence / Status, During Dogger Bank South Surveys (March to August 2023)

Species	Max Breeding Evidence	Breeding Status
Barn owl (Schedule 1)	Individuals in breeding habitat in breeding season	Possible
Fieldfare (Schedule 1)	Species observed but suspected to be still on migration	Non-breeding
Peregrine (Schedule 1)	Flying over	Non-breeding
Redwing (Schedule 1)	Species observed but suspected to be still on migration	Non-breeding
Blackcap	Confirmed pair and juvenile	Confirmed
Chaffinch	Juvenile	Confirmed
Robin	Juvenile	Confirmed
Starling	Juvenile + food	Confirmed
Tree sparrow	Carrying food	Confirmed
Woodpigeon	Juvenile	Confirmed
Wren	Juvenile	Confirmed
Blackbird	Pairs observed in suitable nesting habitat in breeding season	Probable
Carrion crow	Pairs observed in suitable nesting habitat in breeding season	Probable
Collared dove	Pairs observed in suitable nesting habitat in breeding season	Probable
Great tit	Pairs observed in suitable nesting habitat in breeding season	Probable
Greylag goose (British / Irish naturalized)	Pairs observed in suitable nesting habitat in breeding season	Probable
Linnet	Pairs observed in suitable nesting habitat in breeding season	Probable
Pheasant	Pairs observed in suitable nesting habitat in breeding season	Probable
Rook	Territorial behaviour	Probable
Stock Dove	Pairs observed in suitable nesting habitat in breeding season	Probable
Swallow	Pairs observed in suitable nesting habitat in breeding season	Probable
Blue tit	Individuals in breeding habitat in breeding season	Possible
Bullfinch	Individuals in breeding habitat in breeding season	Possible
Buzzard	Individuals in breeding habitat in breeding season	Possible
Chiffchaff	Individuals in breeding habitat in breeding season	Possible
Dunnock	Calling	Possible
Goldcrest	Individuals in breeding habitat in breeding season	Possible
Goldfinch	Singing	Possible
Greenfinch	Individuals in breeding habitat in breeding season	Possible
Green woodpecker	Individuals in breeding habitat in breeding season	Possible
House martin	Individuals in breeding habitat in breeding season	Possible
House sparrow	Individuals in breeding habitat in breeding season	Possible
Jackdaw	Individuals in breeding habitat in breeding season	Possible
Long-tailed tit	Calling	Possible

Species	Max Breeding Evidence	Breeding Status
Magpie	Individuals in breeding habitat in breeding season	Possible
Meadow pipit	Individuals in breeding habitat in breeding season	Possible
Mistle thrush	Calling	Possible
Red-legged partridge	Individuals in breeding habitat in breeding season	Possible
Reed bunting	Individuals in breeding habitat in breeding season	Possible
Song thrush	Calling	Possible
Skylark	Individuals singing and in breeding habitat in breeding season	Possible
Stock Dove	Individuals in breeding habitat in breeding season	Possible
Yellowhammer	Calling	Possible
Whitethroat	Singing	Possible
Willow warbler	Individuals in breeding habitat in breeding season	Possible
Black-headed gull	Observed in unsuitable breeding habitat in breeding season	Non-breeding
Common gull	Species observed but suspected to be still on migration	Non-breeding
Curlew	Species observed but suspected to be still on migration	Non-breeding
Herring gull	Observed in unsuitable breeding habitat in breeding season	Non-breeding
Lesser black-backed gull	Observed in unsuitable breeding habitat in breeding season	Non-breeding
Swift	Flying over	Non-breeding

163. The desk-study of breeding birds in OCS Zone 8 from BTO Birdtrack data identified 29 breeding bird species with possible, probable or confirmed breeding status (**Table 23-28**). Schedule 1 species included evidence of possible breeding by barn owl. An additional Schedule 1 species, red kite, is historically recorded within OCS Zone 8 (BTO Birdtrack records pre-2020), although all records returned from the BTO concerned birds present in non-breeding months.

Table 23-28 Occurrence in OCS Zone 8 of Breeding Bird Species and Breeding Evidence / Status (BTO Birdtrack, Excludes Sensitive Species)

Species	Max Breeding Evidence	Breeding Status
2020-2024		
Barn owl (Sched 1)	Recorded in breeding months	Possible
Blackbird	Carrying food or faecal sac	Confirmed
Great tit	Occupied nest	Confirmed
House martin	Occupied nest	Confirmed
Wren	Recently fledged young	Confirmed
Buzzard	Pairs observed in suitable nesting habitat in breeding season	Probable
Chaffinch	Territorial behaviour	Probable
Collared dove	Display and courtship	Probable
Dunnock	Territorial behaviour	Probable
Goldfinch	Territorial behaviour	Probable
House sparrow	Building nest	Probable
Mallard	Pairs observed in suitable nesting habitat in breeding season	Probable
Robin	Territorial behaviour	Probable
Skylark	Territorial behaviour	Probable
Swallow	Visiting probable nest site	Probable
Tree sparrow	Building nest	Probable

Species	Max Breeding Evidence	Breeding Status
Yellowhammer	Territorial behaviour	Probable
Blackcap	Singing	Possible
Blue tit	Individuals in breeding habitat in breeding season	Possible
Chiffchaff	Singing	Possible
Coal tit	Singing	Possible
Linnet	Individuals in breeding habitat in breeding season	Possible
Magpie	Individuals in breeding habitat in breeding season	Possible
Pheasant	Singing	Possible
Rook	Individuals in breeding habitat in breeding season	Possible
Song thrush	Individuals in breeding habitat in breeding season	Possible
Whitethroat	Singing	Possible
Willow warbler	Singing	Possible
Woodpigeon	Individuals in breeding habitat in breeding season	Possible
Additional Schedule 1, Confirmed or Probable Species 2019 or Earlier Only		
Red kite (Schedule 1)	Recorded in non-breeding months	Possible
Lapwing	Display and courtship / Agitated behaviour	Probable
Mistle thrush	Pairs observed in suitable nesting habitat in breeding season	Probable

164. The existing baseline of breeding birds at the landfall is established via a targeted desk study as reported in **Volume 2, Appendix 13.5 Intertidal Ornithology Baseline Characterisation Report**.

165. Breeding species at the landfall confirmed by the desk study comprise sand martin and tree sparrow (the latter potentially occupying vacant sand martin nest cavities). The desk study also reports evidence of probable breeding by meadow pipit and skylark in terrestrial habitat bordering the landfall. Sand martin nests were also identified at the landfall during baseline benthic and intertidal surveys in July 2024 (**Volume 2, Appendix 10.2 Intertidal Ecology Survey Report**). These species are considered within this chapter as they are effectively onshore ornithology receptor species. No breeding qualifying features of Greater Wash SPA (tern species) are frequent at the landfall whether foraging, resting or breeding.

23.6.1.3.5.12 Invasive Non-Native Species

166. The desk study identified 114 records of Invasive Non-Native Species (INNS) listed under Schedule 9 of the WCA (1981) within 2km of the Onshore Development Area, none of which were within the Onshore Development Area itself. The species identified including the following:

- Marsh frog *Pelophylax ridibundus*;
- Japanese rose *Rosa rugosa*;
- Japanese knotweed *Fallopia japonica*;
- Canadian waterweed *Elodea canadensis*;
- Jenkin's spire snail *Potamopyrgus antipodarum*; and
- Wall cotoneaster *Cotoneaster horizontalis*.

167. The PEA surveys (see **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified seven instances of INNS located within the Onshore Development Area, these were in reference to the following species:

- Listed under Schedule 9 of the WCA (1981):
  - Yellow archangel *Lamium galeobdolon*;
  - Cotoneaster Cotoneaster spp; and
  - *Montbretia Crocosmia x crocosmiiflora*.
- INNS not legally controlled under Schedule 9 of the WCA (1981):
  - Cherry laurel *Prunus laurocerasus*.

168. The INNS listed under Schedule 9 of the WCA (1981) are legally prohibited from being planted to spread in the wild and therefore their control is of **medium** importance.

169. Cherry laurel is not listed under Schedule 9 of the WCA (1981) and therefore its spread is not legally controlled. However, it is a non-native species and its spread should not be promoted within natural or semi-natural habitats. The importance of Cherry laurel within the Onshore Development Area is **low**.

23.6.2 Predicted Future Baseline

170. In the event that the Project is not developed, an assessment of future conditions for onshore ecology and ornithology has been carried out and is described within this section.

171. The management and ecological protection of statutory and non-statutory sites (as referenced in **Section 23.6.1.1** and **Section 23.6.1.2**) would continue to fall to the existing management organisations. Other land, used for agricultural or residential purposes, would continue under the current management.

172. Climate change could have wide-ranging impacts upon the populations of species and distribution of habitats present in the Onshore Development Area. Assuming the management continues in the same manner, species both floral and faunal could experience population decline and range shifts as a direct or indirect result of climate change. This would in turn alter the habitat distribution on the site, which may further feed into species distribution and population change.

173. Many of the species identified within this PEIR chapter are already experiencing the negative impacts of climate change, through shifting and contracting ranges, unusual population fluctuations, and interactions with invasive species and diseases. Some of these impacts are also liked to land-use changes and disturbance from humans.

174. Some changes may be less linked to climate change and more focused by human interference, such as hazel dormice and water vole being re-introduced UK-wide, increasing the ranges of these species.

175. Predicted sea level rise as a result of climate change could lead to a decrease in coverage of terrestrial habitats along the coast and the encroachment of tidal habitats in their place. Saltwater may increase the salinity of the freshwater rivers and streams, which would in turn alter the freshwater ecosystems within.

176. The impacts of climate change are being mitigated, and in some cases, reversed, by the implementation of protective legislation for habitat and species, as well as alterations in farming practices and the efforts of conservation organisations. Where a valued ecological receptor is known to be experiencing baseline natural trends that are relevant to this impact assessment, this is noted in the individual receptor's assessment presented in **Section 23.7**.

23.7 Assessment of Effects

177. The likely potential significant effects to onshore ecology and ornithology receptors that may occur during construction, operation and decommissioning of the Project are assessed in the following sections. The assessment follows the methodology set out in **Section 23.5.3** and is based on the realistic worst-case scenarios defined in **Section 23.4.4**, including the embedded mitigation measures identified in **Section 23.4.3**.

178. As noted in **Section 23.4.5**, the assessment of likely significant effects for the OCS zone infrastructure will generally remain the same for both development scenarios. However, where relevant, differences between OCS Zones 4 and 8 are noted in the assessment.

179. It should be noted that further targeted species surveys will be undertaken in 2025 to provide a detailed baseline of species present within the Onshore Development Area and to inform the assessment at ES stage. These further surveys are summarised in **Table 23-8.**

23.7.1 Potential Effects during Construction

180. In general, direct and indirect effects during construction comprise the following pathways:

- Noise and visual disturbance to animal species may occur during the construction phase due to increased presence of vehicles, plant and equipment, and increased presence and intensity of noise and light emissions;
- Air quality changes may occur during the construction phase due to vehicle exhaust and dust deposition. The air quality changes may impact on sites or species in vicinity, through smothering of surfaces, and irritation of or interference with light transmission, plant photosynthesis and animal respiration or vision;
- Construction impacts may occur as a result of hydrological linkages between construction activities and ecological receptors, via groundwater or waterways; and
- Permanent and temporary habitat loss may occur during the construction phase due to vegetation clearance required for the onshore infrastructure.

23.7.1.1 Direct and Indirect Impacts to Designated Ecological Sites (ECO-C-01): International

181. There are three internationally designated ecological sites within 10km of the Onshore Development Area: the Greater Wash SPA, the Humber Estuary SPA, SAC and Ramsar site and Hornsea Mere SPA.

182. The Greater Wash SPA is a marine SPA of area 3,536 km^2, with a very small proportion of its boundary (3.9km) bordering the Onshore Development Area at the Project's landfall.

183. A small portion of the Onshore Development Area lies within 10km of the Humber Estuary SPA and Ramsar site (specifically the south corner of the OCS Zone 8, and the south-west, south-east and north-east quadrants of the onshore ECC loop to the east of this); this radius is defined by Natural England as constituting potential Functionally Linked Land (FLL) of the SPA and Ramsar site. FLL is a term used to describe areas of land or sea occurring outside a designated site which is considered critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a SPA or Ramsar site has been designated. These habitats are frequently used by SPA species and support the functionality and integrity of the designated sites for these features.

184. An assessment was carried out to determine if this small portion of the Onshore Development Area, or land within 300m of its boundary, constituted FLL. When including land which lies both within 300m of the Onshore Development Area boundary and within 10km of the Humber Estuary SPA and Ramsar site, the total area is 3.5km^2 and is referred to as the 'potential FLL area'. In line with Natural England guidance via the DAS, the assessment was informed by preliminary site-specific survey data, desk-based habitat data and existing bird abundance and distribution data for the area, aerial photography, topography and habitat maps, and ecological literature.

185. Natural England's Annex 1: Guidance in relation to Functionally Linked Land of the Humber Estuary SPA states that: *"Natural England has generally advised that if ≥1% of a Humber Estuary bird species population could be affected by a proposal, alone or in combination with other plans or projects, then further consideration is required."* This FLL assessment, detailed in the **Report to Inform Appropriate Assessment** (document reference 5.3), identified one occurrence of greylag goose (British / Irish population), defined by Natural England as a 'main component species' of the non-breeding waterbird assemblage feature of the SPA, alighted on the potential FLL area in numbers exceeding 1% of their Humber Estuary SPA population of 2,154 individuals (BTO WeBS 2018/19 to 2022/23). This occurrence of 67 individuals was during one (August) of 11 baseline transect surveys of the area surveyed by Dogger Bank South, with no occurrence of the species or any other SPA feature or main assemblage component species in numbers exceeding this 1% threshold in the remaining desk-based data or in site-specific surveys undertaken from August to December 2024. Therefore, while one historical occurrence is noted, there is no evidence at the PEIR stage that the potential FLL area is frequently or even repeatedly used by any SPA qualifying feature or assemblage species in numbers sufficient for 1% of their SPA population to be potentially affected by the Project.

186. There is a preliminary indication that the small portion of land in or adjacent to the Onshore Development Area that lies within 10km of the Humber Estuary does not act as FLL of the Humber Estuary SPA. Further project-specific transect and vantage point survey data will be available and analysed at ES stage regarding detailed use of the potential FLL area by SPA qualifying features, or species defined as main components of the assemblage. Should site-specific surveys identify use of FLL in or within 300m of the Onshore Development Area by birds associated with the SPA, the nature and regularity of use of the land will be outlined and assessed in the ES.

187. Potential effects from the Project on the Humber Estuary SPA and Ramsar site are outlined in this section and in the **Report to Inform Appropriate Assessment** (document reference 5.3)**.**

188. The Humber Estuary Ramsar site has a similar boundary to that of the Humber Estuary SPA, and so is identified as a designated site for consideration on the basis of the potential presence of FLL of the Humber Estuary SPA as identified in line with Natural England DAS guidance.

189. With regard to air quality impacts, the Humber Estuary SPA, SAC and Ramsar is outside of the potential ZoI, with the exception of small sections of the designation which are within 200m of proposed construction traffic routes (Road Links 24, 26 and 80), as detailed within **Chapter 20 Air Quality and Dust.**

190. Hornsea Mere SPA is located approximately 6.4km south of the Onshore Development Area and is designated for its ornithological importance. It was agreed at the second meeting of ETG6 (2nd October 2024) that a 5km buffer distance proposed by the Applicant was appropriate for potential functional linkage of Onshore Development Area land to this SPA, based on the specific qualifying features of the SPA (mute swan, gadwall), and therefore the Onshore Development Area has no potential to constitute FLL of this SPA and Hornsea Mere SPA is screened out from further assessment.

191. Avoidance of and minimisation of impacts to internationally designated sites for nature conservation, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details). Statutory internationally designated nature conservation sites can be seen on **Figure 23-2.**

192. As described in **Table 23-5,** embedded mitigation measures will include the following measures as part of the Outline CoCP to be submitted with the DCO application. A draft version of the **Outline Code of Construction Practice** (document reference 8.9) is provided with the PEIR. Post-consent, a CoCP will be developed in accordance with the Outline CoCP (Commitment ID CO39) for each stage of construction works. The CoCP will include:

- Watercourse Crossing Method Statement(s) (WCMS) (Commitment ID CO35), detailing the crossing technique and construction methodology to be undertaken at each watercourse crossing and associated environmental mitigation measures;
- A Drilling Fluid Breakout Management Plan (Commitment ID CO38), detailing mitigation measures to reduce the risk of breakouts during trenchless installation works and a response plan should a breakout occur;
- A Pollution Prevention Plan (PPP) (Commitment ID CO40), including measures to protect ground and surface waters from pollution incidents during construction and control measures for the use and storage of any fuels, oils and other chemicals;
- A Construction Noise and Vibration Management Plan (CNVMP) (Commitment ID CO70), detailing management measures to control noise and vibration emissions during construction; and
- An Air Quality Management Plan (AQMP) (Commitment ID CO55), detailing management measures to control dust and other air emissions during construction.

193. An Outline EcoMP will be developed at ES stage and submitted with the DCO application. This will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including those associated with designated ecological sites. Post-consent, an EcoMP will be developed in accordance with the Outline EcoMP for each stage of construction works. The EcoMP will be submitted to and agreed with the relevant authorities prior to the commencement of the relevant stage of construction works (Commitment ID CO81).

23.7.1.1.1 Receptor Importance / Sensitivity

194. The Greater Wash SPA is of **high importance** as an international statutory designated site. This is due to the qualifying features including internationally important numbers of various species of breeding and wintering waterbirds.

195. Supporting habitats of the Greater Wash SPA are **not sensitive** to nutrient enrichment and have **low to medium sensitivity** to emissions of other substances (solid, liquid, gas) (Natural England, 2024a).

196. Habitats sensitive to air quality impacts under the Greater Wash SPA designation include shifting coastal dunes and coastal stable dune grasslands (acid and calcareous type). However, none of these habitats are present within 200m of the Onshore Development Area. Therefore, as detailed within **Section 20.6.13** of **Chapter 20 Air Quality and Dust**, this receptor is not anticipated to be sensitive to air quality or dust impacts and has been scoped out of the assessment.

197. Among Greater Wash SPA features, red-throated diver and common scoter have **high sensitivity** to above-water noise or visual disturbance associated with construction at the landfall (Natural England, 2024a). Common tern, little tern, Sandwich tern and little gull have **low sensitivity** to above-water noise and visual disturbance and they are present in the SPA and in vicinity of the proposed works predominantly undertaking foraging or migration offshore (**Volume 2, Appendix 13.5 Intertidal Ornithology Baseline Characterisation Report**). Therefore, these latter species are not considered further in assessment of effects on the SPA.

198. The Humber Estuary SAC, SPA and Ramsar site is of **high** importance as a statutory designated site. This is due to the qualifying features of each designation including Annex I habitats, Annex II species and internationally important numbers of various species of breeding and wintering waterbirds. The water column habitat of the Humber Estuary SPA has **high sensitivity** to nutrient enrichment while other habitats are **not sensitive** to nutrient enrichment. Some habitats of the Humber Estuary (intertidal mud and intertidal sand / muddy sand) have **low to medium sensitivity** to emissions of hydrocarbons, PAH and other substances (solid, liquid, gas) while the remainder are classed as **not sensitive**. Sensitivity to construction road vehicle exhaust emissions is discussed in **Chapter 20 Air Quality and Dust**.

23.7.1.1.2 Impact Magnitude

199. As assessed in **Chapter 21 Water Resources and Flood Risk**, effects of increased sediment supply (WRF-C-02) and supply of contaminants to surface and groundwater (WRF-C-03) to Barmston Sea Drain (which is a hydrological linkage between the Onshore Development Area and the Greater Wash SPA) are minor adverse and non-significant in EIA terms.

200. Accidental release of pollutants during construction is prevented or limited by embedded mitigation measures as outlined in **Chapter 10 Benthic and Intertidal Ecology**. Therefore, there is **negligible** magnitude of impact via air quality or hydrological linkage.

201. Impact of above-water noise or visual disturbance and displacement to the red-throated diver and common scoter features of the Greater Wash SPA could entail direct effects on foraging or resting, and therefore on energy budgets and body condition. However, above-water noise and visual presence of plant onshore at the landfall would be confined to the landfall construction compound and associated access and haul road. Maximum noise level at source (L_{WA}) from activities at landfall is reported in **Volume 2, Appendix 25.3 Construction Noise and Vibration Assessment** to be 110dB when two drilling rigs are used during landfall trenchless installation works, and the landward entry pit will be set back at a sufficient setback distance from the cliff edge. 100m to 300m from the noise sources, the maximum noise level experienced is modelled to be 63dB during site preparation and 49dB during trenchless installation works. The majority of construction activities will necessarily take place at mid to low tide (when inshore waterbirds such as red-throated diver and common scoter will be further from the MHWS) for suitable access, safety and substrate conditions. The widespread occurrence along the Holderness Coast of red-throated diver and common scoter (**Volume 2, Appendix 13.5 Intertidal Baseline Characterisation Report**) indicates that any area from which works may cause displacement would not result in a significant reduction in the total area of available habitat for resting and foraging. While peak counts of individuals in or flying over inshore waters at the landfall are potentially significant as a percentage of national population (**Volume 2, Appendix 13.5 Intertidal Baseline Characterisation Report**), many birds within view of the land are likely to be outside the ZoI for disturbance and displacement by onshore works. The landfall presents no significant noise or visual imposition on the total area of the SPA. Therefore, there is **negligible** magnitude of impact via disturbance and displacement from onshore construction activities.

202. As assessed in **Chapter 20 Air Quality and Dust**, construction road vehicle exhaust emissions (specifically nutrient nitrogen deposition) exceed 1% of the lower critical load in the Humber Estuary SPA / SAC / Ramsar site within 200m of the road crossing of the designated site (Road Links 24, 26 and 80 along the A15 and A63), and therefore, this level of emission “cannot be considered to be insignificant” and require further consideration from an ecological perspective. However, the area over which emissions exceed this load constitutes a negligible proportion of the designation and would act on a negligible proportion of the SPA / SAC / Ramsar site water column habitat or volume, therefore the magnitude of effect is **negligible**.

203. As assessed in **Chapter 21 Water Resources and Flood Risk**, the impact magnitude of changes to the sediment supply (WRF-C-02) and supply of contaminants to surface and groundwater (WRF-C-03) to the Environment Agency operational catchments ‘Hull Upper’ and ‘Hull Lower’ (which are the hydrologically linked with the Onshore Development Area and the Humber Estuary SPA / SAC / Ramsar) are **negligible** to **low** adverse. Any such low magnitude impacts are anticipated to be categorised in accordance with **Table 21-10** of **Chapter 21 Water Resources and Flood Risk.** As such, impacts are anticipated to be highly localised and not great enough temporally or spatially to have a greater than **negligible** magnitude of impact on hydrologically linked receptors which are not within the immediate vicinity. The Humber Estuary SPA / SAC / Ramsar site, at its closest point, in a straight line distance, is 9.4km from to the Onshore Development Area. As such, any impacts via hydrological linkage under WRF-C-02 or WRF-C-03 will be of a **negligible** magnitude upon this receptor.

23.7.1.1.3 Effect Significance

204. The Greater Wash SPA is considered of high importance, and two qualifying features, red-throated diver and common scoter, have **high sensitivity** to disturbance. The magnitude of construction impacts via air quality or hydrological linkage and for disturbance and displacement is **negligible** for the Greater Wash SPA. The significance of effect for these impacts will be **minor adverse**, which is **not significant** in EIA terms.

205. Humber Estuary SAC, SPA and Ramsar site are considered of **high** importance. The magnitude of construction impacts via air quality and hydrological linkage is **negligible** for Humber Estuary SAC, SPA and Ramsar. The significance of effect for these impacts will be **minor adverse**, which is **not significant** in EIA terms.

23.7.1.2 Direct and Indirect Impacts to Designated Ecological Sites (ECO-C-01): National, Local and Non-Statutory

206. The only national statutory designated ecological site within the Onshore Development Area is the Leven Canal SSSI (crossed by a temporary construction access route identified at an existing bridge crossing only), which may be impacted by disturbance from sediment and pollutant release into watercourses through construction activities. Additionally, the following national and local statutory designated ecological sites have been identified within 2km of the Onshore Development Area, and therefore could be indirectly impacted by changes to the air quality, noise and hydrological linkage baselines during construction activities:

- Bryan Mills Field SSSI;
- Burton Bushes SSSI;
- Tophill Low SSSI;
- Pulfin Bog SSSI; and
- Beverley Parks LNR.

207. Non-statutory sites which lie within or adjacent to the Onshore Development Area are listed in **Table 23-29**, with the accompanying reasons for designation and the potential effects that may occur. Sites which are hydrologically connected to the Onshore Development Area have also been included and assessed for potential effects.

Table 23-29 Non-Statutory Ecological Sites Within, Adjacent or Hydrologically Connected to Onshore Development Area Assessed for Significance of Effect

Receptor	Distance from Onshore Development Area	Features	Potential Effects
Bealey's Lane LWS	Partially within the Onshore Development Area	Old, established semi-natural neutral grassland	Disturbance of verge through vegetation clearance for construction works within the onshore ECC. Indirect effects from construction-related air quality emissions.
Bealey's Beck, Lockington LWS	Within the Onshore Development Area	Stream	Disturbance of verge through vegetation clearance for construction works within the onshore ECC. Indirect effects from construction-related air quality emissions.
Beeford – Dunnington LWS	Within the Onshore Development Area	Good quality established semi-natural verge	Disturbance of grassland through vegetation clearance for construction works within the onshore ECC. Indirect effects from construction-related air quality emissions.
Bryan Mills Beck LWS	Adjacent to the south of the Onshore Development Area.	Nutrient rich standing water	Indirect effects from construction-related air quality emissions.
Fishpond Wood, Risby Estate LWS	Partially within the Onshore Development Area	Mosaic of semi-natural habitats including woodland and wetland that also supports field evidence of features of ancient or long-standing acid woodland	Disturbance of hedgerow through vegetation construction works within the onshore ECC. Indirect effects from construction-related air quality emissions.
Jillywood Lane LWS	Adjacent to the west of the Onshore Development Area	Good quality hedgerow, medieval boundary and ancient woodland boundary	Indirect effect from construction-related air quality emissions.
Lake's Wood LWS	Adjacent to the south of the Onshore Development Area	Ancient semi-natural woodland	Indirect effects from construction-related air quality emissions.
Leman Wood LWS	Adjacent to the west of the Onshore Development Area	Ancient semi-natural woodland with evidence of features to support this	Indirect effects from construction-related air quality emissions.

Receptor	Distance from Onshore Development Area	Features	Potential Effects
Raventhorpe Embankment LWS	Within the Onshore Development Area	Good quality established semi-natural linear grassland	Disturbance of verge through vegetation construction works within the onshore ECC. Indirect effects from construction-related air quality emissions.
Risby Park LWS	Within the Onshore Development Area	Mosaic of semi-natural habitats including woodland and grassland	Disturbance of woodland through vegetation clearance. Indirect effects from construction-related air quality emissions.
Scorborough Lane LWS	Adjacent to the south of the Onshore Development Area	Good quality 'vergescape' consisting of a hedgerow with 7 woody species per 30m sample, and verge habitats	Indirect effects from construction-related air quality emissions.
Leman Road Corner – Moorbeck Road (A) LWS	Partially within the Onshore Development Area	Good quality established semi-natural verge	No direct effects. This LWS intersects an O&M access route only, and no vegetation clearance works are anticipated. Indirect effects for construction-related air quality emissions.
Leman Road Corner – Moorbeck Road (B) LWS	Partially within the Onshore Development Area	Good quality established semi-natural verge	No direct effects. This LWS intersects an O&M access route only, and no vegetation clearance works are anticipated. Indirect effects for construction-related air quality emissions.
Birkhill Wood LWS	Adjacent to the west of the Onshore Development Area	Ancient semi-natural woodland with evidence of features to support this	Indirect effects for construction-related dust and air quality emissions. Indirect effects from sediment and pollutant release into watercourses through construction activities.
Newbald Road LWS	Adjacent to the east of the Onshore Development Area.	Good quality hedgerow with 7 woody species per 30m sample	Good quality hedgerow with 7 woody species per 30m sample.
Bygot Wood Lane, Leconfield LWS	8m north of the Onshore Development Area, hydrologically connected	Good quality established semi-natural verge	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Brandsburton – Frodingham Road LWS	70m south of the Onshore Development Area, hydrologically connected	Good quality hedgerow with 6 woody species per 30m sample	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Barff Hill Causeway LWS	240m north of the Onshore Development Area, hydrologically connected	Nutrient rich standing water in roadside ditch	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Bentley Moor Wood LWS	260m west of the Onshore Development Area, hydrologically connected	Ancient semi-natural woodland	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Lockington LWS	500m north of the Onshore Development Area, hydrologically connected	Old, established semi-natural neutral grassland	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Strick Pastures LWS	600m north-west of the Onshore Development Area, hydrologically connected	Mosaic of semi-natural habitats including grassland and nutrient-rich standing water in the ditches	Indirect effects from sediment and pollutant release into watercourses through construction activities.

Receptor	Distance from Onshore Development Area	Features	Potential Effects
Skipsea Brough LWS	800m north of the Onshore Development Area, hydrologically connected	Old, established semi-natural neutral and calcareous grassland	Indirect effects from sediment and pollutant release into watercourses through construction activities. Indirect effects from noise and visual disturbance through construction activities.
Tophill Low LWS	1km west of the Onshore Development Area, hydrologically connected	Mosaic of semi-natural habitats including grassland, fen and standing water. Has good examples of old, established semi-natural neutral and calcareous grassland, rich-fen and nutrient rich standing water habitats	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Pulfin Bog YWT	1.1km south of the Onshore Development Area, hydrologically connected	Marsh habitat with a variety of marsh flowers	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Low Farm, Routh LWS	1.2km east of the Onshore Development Area, hydrologically connected	Good quality hedgerow	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Watton Carr LWS	1.5km north of the Onshore Development Area, hydrologically connected	Wetland site that regularly supports significant populations of at least 10 species of overwintering water-birds of conservation concern	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Lockington Wood LWS	1.5km north-west of the Onshore Development Area, hydrologically connected	Ancient semi-natural woodland	Indirect effects from sediment and pollutant release into watercourses through construction activities.
Mill Beck and Fields LWS	1.7km south-east of the Onshore Development Area, hydrologically connected	Old, established semi-natural neutral grassland	Indirect effects from sediment and pollutant release into watercourses through construction activities.

208. Avoidance of and minimisation of impacts to nationally and locally designated sites for nature conservation, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details). Statutory national designated nature conservation sites can be seen on **Figure 23-3**, and non-statutory locally designated nature conservation sites are shown on **Figure 23-4**.

209. With respect to the LWS that are fully or partially within the Onshore Development Area, direct impacts to these sites from cable duct installation works will be avoided, where reasonably practicable, by micro-siting or using a trenchless installation technique (Commitment ID CO83). Trenchless crossing entry and exit points will be located at least 20m away from the bank of main rivers and at least 9m away from the bank of IDB maintained drains and ordinary watercourses (Commitment ID CO33), reducing the risk of impacts upon hydrologically connected LWS. Onshore export cables will be installed at a depth of at least 2m below channel bed (to the top of the duct / cable or otherwise) (Commitment ID CO36). Where direct impacts cannot be avoided, bespoke mitigation will be agreed with the relevant authorities where required (see **Table 23-5**, Commitment ID 83).

210. As described in **Table 23-5,** embedded mitigation measures will include the following measures as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39):

- WCMS (Commitment ID CO35), detailing the crossing technique and construction methodology to be undertaken at each watercourse crossing and associated environmental mitigation measures;

- A Drilling Fluid Breakout Management Plan (Commitment ID CO38), detailing mitigation measures to reduce the risk of breakouts during trenchless installation works and a response plan should a breakout occur;
- A PPP (Commitment ID CO40), including measures to protect ground and surface waters from pollution incidents during construction and control measures for the use and storage of any fuels, oils and other chemicals;
- A CNVMP (Commitment ID CO70), detailing management measures to control noise and vibration emissions during construction; and
- An AQMP (Commitment ID CO55), detailing management measures to control dust and other air emissions during construction.

211. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including those associated with designated ecological sites. Measures to provide screening to facilitate the integration of built infrastructure in the Onshore Converter Station (OCS) zone into the existing landscape (Commitment ID CO65) will also minimise impacts of the Project on LWS.

23.7.1.2.1 Receptor Importance

212. The non-statutory sites presented in **Table 23-29** are of **medium** importance, as they are not of statutory designation but do still contain habitats which enhance the ecological value of the area.

213. Leven Canal SSSI is of **high** importance as a statutory designated site and diverse wetland which is a remnant of a habitat type that is no longer widespread and does not tolerate change in its quality.

214. Bryan Mills Field SSSI is of **high** importance as a statutory designated site. It is of small size (1.3ha) making it sensitive to ecological changes and less able to recover from disturbance.

215. Burton Bushes SSSI is of **high** importance, as the undisturbed soil is an important qualifying feature of the site, and rich herb flora are present in remnant populations. The soil and flora would be sensitive to disturbance from construction activities.

216. Tophill Low SSSI is of **high** importance as a statutory designated site. The habitat consists of two artificial storage reservoirs which are less sensitive to disturbance, but these reservoirs support nationally important numbers of wildfowl, which are more sensitive to disturbance and are significant for the UK's wildfowl population health.

217. Pulfin Bog SSSI is of **high** importance as a statutory designated site and fenland reed swamp community, supporting sensitive botanical communities and breeding birds. Fenland is highly sensitive to disturbance and ecological change.

218. Beverley Parks LNR is of **medium** importance as a non-statutory designated site. The habitats present (broadleaved woodland, orchard and grasslands) are not as sensitive as those listed for the above SSSI, and can cope with and recover from a larger extent of disturbance.

23.7.1.2.2 Impact Magnitude

219. The magnitude of the construction impacts on nationally, locally and non-statutory designated sites is considered to be **negligible**, as the construction activities are unlikely to adversely affect the designated features of the designated ecological sites with the implementation of embedded mitigation measures and considering the temporary nature of construction impacts.

23.7.1.2.3 Effect Significance

220. The significance of effect for all statutory and non-statutory designated sites will be **minor adverse**, which **is not significant** in EIA terms. This is primarily due to direct impacts being avoided and minimised through the site selection process, and indirect impacts being avoided or minimised through embedded mitigation measures.

23.7.1.3 Direct Impacts to Habitats (ECO-C-02): Woodlands

221. Two areas of traditional orchard priority habitat recorded during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) were within the Onshore Development Area, as a secondary code of modified grassland. Additionally, the desk study highlighted 27 parcels of traditional orchard within 2km of the Onshore Development Area, one of which is within the Onshore Development Area.

222. The following woodland types, also considered to be priority habitats, were recorded during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) within the Onshore Development Area: lowland mixed deciduous woodland (11.38ha), lowland beech and yew woodland (0.05ha) and wet woodland (0.01ha). Further parcels of broadleaved (0.02ha plus 1.43km length) and coniferous woodland (1.55ha) habitat types were also present within the Onshore Development Area, however, were not considered to be priority habitats.

223. The arboriculture survey (**Volume 2, Appendix 23.4 Arboricultural Survey Report**) identified a total of 18 veteran trees across the Onshore Development Area across four species: five oak *Quercus robur*, nine ash *Fraxinus excelsior*, one white willow *Salix alba* and one crack willow *Salix fragilis*. No ancient trees were recorded within the Onshore Development Area or within 15m of the Onshore Development Area.

224. Seven ancient woodland sites were found to be within 2km of the Onshore Development Area during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**). Two of these sites, Leman Wood and Birkhill Wood were identified within the PEA report as having potential to be impacted, by construction, due to their proximity to the Onshore Development Area.

225. The remaining ancient woodlands were ruled out of being directly impacted due to their distance from the Onshore Development Area. Leman Wood is an ancient and semi-natural woodland, and Birkhill Wood is an ancient and semi-natural woodland with ancient, replanted woodland. Both sites are adjacent to the Onshore Development Area.

226. Avoidance of and minimisation of impacts to ancient woodlands and priority habitats, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details).

227. As part of embedded mitigation measures described in **Table 23-5** (Commitment ID CO100), all areas of land temporarily disturbed during construction will be reinstated to pre-existing conditions as far as reasonably practicable. Such reinstatement will commence as soon as practicable following completion of the relevant section of works in the area.

228. In addition, Commitment ID CO59 states that protection of veteran or ancient trees and ancient woodlands will be prioritised to prevent the loss of irreplaceable habitats or features, such as through micro-siting and use of trenchless installation techniques where reasonably practicable. These measures will be further informed and supported by the data provided within the Preliminary Arboricultural Impact Assessment provided at ES stage.

229. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including those associated with woodlands.

230. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**.

231. Indirect impacts from changes in hydrological connectivity, drilling fluid breakout, pollution, changes in baseline noise, air quality from traffic emissions, generators, construction machinery and dust have the potential to occur on woodland habitats. These indirect impacts will be temporary in nature, associated with the construction phase only. As described in **Table 23-5** and **Section 23.7.1.1,** embedded mitigation measures will include the following measures as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39) to avoid and minimise potential indirect impacts on habitats including woodland habitats:

- WCMS (Commitment ID CO35);
- A Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- A PPP (Commitment ID CO40);
- A CNVMP (Commitment ID CO70); and
- An AQMP (Commitment ID CO55).

23.7.1.3.1 Receptor Importance

232. Traditional orchards, lowland mixed deciduous woodland, lowland beech and yew woodland, and wet woodland are all considered to be priority habitats and are therefore of **high** importance. It can take upwards of 10 years for planted trees to become a woodland, mitigating the loss of existing deciduous woodland habitat.

233. Ancient woodlands and veteran trees are also considered to be of **high** importance because they are considered irreplaceable habitats. These woodlands take centuries to develop, making them impossible to recreate quickly.

234. All other non-priority woodland habitat types including other broadleaved woodland, other coniferous woodland, other Scot's pine woodland, and broadleaved and mixed woodland are considered to be of **medium** importance, due to their inherent ecological value but lack of designation or importance above county level.

23.7.1.3.2 Impact Magnitude

235. The magnitude of impact is considered to be **negligible**, as woodland habitats are mostly avoided by the site selection process and indirect effects from dust emissions will be minimal and managed through best practice embedded mitigation measures.

23.7.1.3.3 Effect Significance

236. The significance of effect for all priority and ancient woodland habitats and veteran trees will be **minor** adverse, which is **not significant** in EIA terms), and the significance of effect for all other woodland habitat types is **negligible**, which is **not significant** in EIA terms). This is primarily due to direct impacts being avoided through the site selection process, and indirect impacts being minimised through embedded mitigation measures.

23.7.1.4 Direct Impacts to Habitats (ECO-C-02): Arable Field Margins

237. Arable field margins are listed as a priority habitat where they are specifically managed for wildlife. The following subsets of arable field margin priority habitat were identified within the Onshore Development Area during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**):

- Arable field margins - tussocky (6.25ha);
- Arable field margins - pollen and nectar (2.75ha); and
- Arable field margins (0.05ha).

238. Temporary disturbance of arable field margins may occur during construction activities such as open cut trenching for installation of cable ducts and other excavation works. As part of embedded mitigation measures described in **Table 23-5**, all areas of land temporarily disturbed during construction will be reinstated to pre-existing conditions as far as reasonably practicable. Such reinstatement will commence as soon as practicable following completion of the relevant section of works in the area (Commitment ID CO100).

239. If OCS Zone 8 is selected, there is potential that long-term loss of arable field margin priority habitat would occur due to construction of the permanent area for the OCS and ESBI. OCS Zone 4 does not contain any arable field margin habitat.

240. In addition, along the onshore ECC and at the landfall, some minor habitat loss may be required to make way for the permanent footprint of link boxes. The exact quantum of habitat loss and location of the link boxes is unknown at this stage of design. However, the maximum long term habitat loss is anticipated to be no greater than 1ha with respect to the link boxes at the landfall and along the onshore ECC, and therefore, potential effects are anticipated to be negligible.

241. If this habitat is lost, efforts will be made to provide appropriate enhancement or creation of habitats which provide similar ecological functions within the Onshore Development Area or off-site. This will be delivered as part of the Outline BNG Strategy (Commitment ID CO82), which will be developed at ES stage and submitted with the DCO application.

242. Avoidance of and minimisation of impacts to priority habitats, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details). As a result, direct impacts of priority arable field margin habitats will be minimised by design, including at the OCS zone.

243. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including arable field margins.

244. Indirect impacts from pollution, changes in baseline air quality from traffic emissions and dust have the potential to occur on arable field margin habitats. These indirect impacts will be temporary in nature, associated with the construction phase only. An AQMP (Commitment ID CO55), and a PPP (Commitment ID CO40) will be included as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39) to avoid potential indirect impacts on arable field margin habitats.

23.7.1.4.1 Receptor Importance

245. Arable field margins are a priority habitat, and are therefore of **high** importance. The sensitivity of the habitat is considered to be low for smaller less floristically diverse margins with reduced habitat connectivity, and **medium** for arable field margins which are better established, diverse and ecologically connected to the wider landscape.

23.7.1.4.2 Impact Magnitude

246. The changes to terrestrial habitats are only permanent for OCS Zone 8, and the link boxes, however, they are negligible in scale with minimal impact in the viability of this habitat within the region. As such, the magnitude of impact would be **negligible**.

23.7.1.4.3 Effect Significance

247. The significance of effect for arable field margin habitats will be **minor adverse**, which is **not significant** in EIA terms. This is primarily due to direct impacts being avoided and minimised through the site selection process where possible, habitat creation where required and habitat reinstatement where temporarily impacted by the development.

23.7.1.5 Direct Impacts to Habitats (ECO-C-02): Maritime Cliff and Slopes

248. Five parcels of maritime cliff and slope priority habitat were identified during the desk study within 2km of the Onshore Development Area, two of which were within the Onshore Development Area itself, covering an area of 1.73ha. Approximately 0.98ha of this area was ground truthed and confirmed as present during the PEA surveys. This was classified as the corresponding UKHab habitat type ‘soft rock sea cliffs’ (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) within the landfall of the Project.

249. Potential direct loss of maritime cliff and slope habitat at landfall is avoided through the use of a trenchless installation technique to install cable ducts between the landfall construction compound onshore and the subtidal exit pits (**Table 23-5**, Commitment ID CO23). Maritime cliff and slope habitat is not present at any other areas throughout the Onshore Development Area.

250. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including maritime cliffs and slopes.

251. Indirect impacts from drilling fluid breakout, pollution, changes in baseline air quality from traffic emissions and dust have the potential to occur on maritime cliff and slope habitats. These indirect impacts will be temporary in nature, associated with the construction phase only.

252. As described in **Table 23-5** and **Section 23.7.1.1,** embedded mitigation measures will include the following measures as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39) to avoid and minimise potential indirect impacts on habitats including maritime cliffs and slopes habitats:

- A Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- A PPP (Commitment ID CO40); and
- An AQMP (Commitment ID CO55).

23.7.1.5.1 Receptor Importance

253. Soft rock sea cliffs are a subset of maritime cliff and slope priority habitat and are therefore of **high** importance.

23.7.1.5.2 Impact Magnitude

254. The magnitude of impact on maritime cliff and slope habitats is deemed to be **negligible**, as direct impacts are avoided through the use of trenchless techniques, and embedded mitigation measures to minimise the likelihood of any temporary indirect impacts having a meaningful impact on habitat condition.

23.7.1.5.3 Effect Significance

255. The significance of effect for maritime cliff and slope habitats will be **minor adverse**, which is **not significant** in EIA terms.

23.7.1.6 Direct Impacts to Habitats (ECO-C-02): Riparian and Freshwater Habitats

256. Riparian and freshwater habitats identified within the Onshore Development Area during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) included the following (none of which are considered to be priority habitats):

- Other rivers and streams (0.31ha and a length of 4.44 km);
- Canals (0.83 km);
- Ponds (20 in total); and
- Ditches comprising other standing water (8.09 km), standing open water and canals (1.54 km), temporary water bodies (0.83 km); and other temporary ponds and scrapes (1.50 km).

257. Nine parcels of lowland fen priority habitat were found during the desk study within 2km of the Onshore Development Area, five of which were within the Onshore Development Area itself.

258. Three parcels of reedbed priority habitat were found during the desk study within 2km of the Onshore Development Area. No areas of reedbeds were located within the Onshore Development Area, however they are located directly adjacent to the north-west of the Onshore Development Area and could potentially be indirectly impacted by construction activities.

259. A total of 184 parcels of coastal and floodplain grazing marsh, were found during the desk study within 2km of the Onshore Development Area, six of which were within the Onshore Development Area itself (4.1ha).

260. There is potential that temporary loss of watercourses (including other rivers and streams, canals and ditches) may occur during construction for those being crossed by open cut trenching methods with respect to the cable duct installation or where temporary haul road watercourse crossings are required. In such cases, temporary measures will be employed to maintain the flow of water along the watercourse, minimising changes to hydrological resources in the area (Commitment ID CO35). All Environment Agency Main Rivers will be crossed using trenchless techniques with respect to cable duct installation works (Commitment ID CO32), at a depth of at least 2m below channel bed (to the top of the duct / cable or otherwise) (Commitment ID CO36). **Volume 2, Appendix 4.3 Crossing Schedule – Onshore** provides further details on the proposed crossing methodology at each watercourse crossing location along the onshore ECC.

261. No permanent losses of riparian and freshwater habitats are predicted to occur within either of the OCS zone options, as no such habitats are present within the ecological baseline in these areas.

262. The following embedded mitigation measures, as described in **Table 23-5** (and elaborated upon in **Section 23.7.1.1**, **Section 23.7.1.2** and **Section 23.7.1.3**), applies to reduce the impact of the Project upon riparian and freshwater habitats:

- Avoidance of and minimisation of impacts to priority habitats during the site selection process (see **Chapter 5 Site Selection and Consideration of Alternatives**);
- Trenchless crossing entry and exit points to be located at least 20m away from the bank of main rivers and at least 9m away from the bank of IDB maintained drains and ordinary watercourses (Commitment ID CO33);
- Reinstatement of temporarily disturbed habitats (Commitment ID CO100);
- BNG Strategy (Commitment ID CO82);
- WCMS (Commitment ID CO35);
- Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- PPP (Commitment ID CO40);
- CNVMP (Commitment ID CO70); and
- AQMP (Commitment ID CO55).

23.7.1.6.1 Receptor Importance

263. Running waterbodies, namely other rivers and streams and canals, are deemed to be of **medium** importance. This is as a result of their ability to support protected and notable species, as well as providing hydrological connectivity to the wider riparian habitat network at a district level. However, these habitats are not in good enough condition to be deemed priority habitats.

264. Standing waterbodies, namely ponds and ditches, are deemed to be of **low** importance. This is as a result of their ability to support protected and notable species; however, they are not in a good enough condition to be deemed priority habitats.

265. As priority habitats, lowland fen, coastal and floodplain grazing marsh, and reedbeds are of **high** importance.

23.7.1.6.2 Impact Magnitude

266. With embedded mitigation measures, the magnitude of impact upon riparian and freshwater habitats is **negligible**, as any impacts that occur will be small-scale, temporary, reversible, and only occur during construction.

23.7.1.6.3 Effect Significance

267. The significance of effect for running and standing waterbodies is **minor adverse** and therefore **not significant** in EIA terms.

268. The significance of effect on lowland fen, coastal and floodplain grazing marsh, and reedbed priority habitats is **minor adverse**, which is also **not significant** in EIA terms.

23.7.1.7 Direct Impacts to Habitats (ECO-C-02): Hedgerows

269. Native hedgerow habitats identified within the Onshore Development Area during the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) included the following, all of which were considered to be priority habitats:

- Hedgerow (0.19 km);
- Native hedgerow (5.51 km);
- Other native hedgerow (56.66 km); and
- Species-rich native hedgerow (1.27 km).

270. In addition, 0.20km of non-native and ornamental hedgerow was identified within the Onshore Development Area. This is not considered to be priority habitat.

271. There is potential that hedgerow habitat may be temporarily lost during construction within the onshore ECC, as hedgerow removal may be required to facilitate cable installation or haul road construction. Within the embedded mitigation measures set out in **Table 23-5** (Commitment ID CO59), hedgerow sections to be removed will be kept to a minimum as required for the construction works. Moveable hedgerows are discussed further below in regard to bats in **Sections 23.7.1.10** and **23.7.1.11**.

272. Long-term loss of hedgerow habitat will occur within either of the OCS zone options in order to facilitate the temporary construction and permanent areas required for the OCS and ESBI. OCS Zone 8 has approximately 2.86km of native hedgerow, whilst OCS Zone 4 has 2.19km of native hedgerow.

273. Sections of hedgerows and trees which are removed will be appropriately replaced during reinstatement post-construction by replanting with more diverse and locally appropriate native species. Adaptive management measures to mitigate the effects of climate change on mitigation / replacement planting will be considered to ensure reinstated habitats are effectively established (Commitment ID CO59). Aftercare of mitigation planting will be undertaken during the establishment period for a total of five years in which all planting will be monitored and maintained to ensure good establishment. Indicative activities, timeframes and roles and responsibilities during the establishment period will be set out in the LMP developed post-consent for the relevant stage of construction works (Commitment ID CO65).

274. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including hedgerows.

275. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**.

276. Potential indirect effects upon hedgerow habitats arising from dust emissions generated during constructions works will be short term (i.e. until rain washes the dust from foliage) and localised and managed through the use of dust management measures, detailed within an AQMP (Commitment ID CO55) as part of the CoCP developed post-consent for each stage of construction works.

23.7.1.7.1 Receptor Importance

277. Native and 'other-native' hedgerows are priority habitats and listed on the East Riding of Yorkshire LBAP and are therefore considered to be of **high** importance.

278. Non-native and ornamental hedgerows are not a priority habitat and not listed on the East Riding of Yorkshire LBAP. They do however provide connectivity within the wider landscape for commuting corridors at a local level, resulting in a **negligible** level of importance.

23.7.1.7.2 Impact Magnitude

279. With the implementation of embedded mitigation measures, the impact magnitude on all hedgerow types is anticipated to be **negligible adverse**.

23.7.1.7.3 Effect Significance

280. The significance of effect on native and 'other-native' hedgerows is **minor adverse**, which is **not significant** in EIA terms.

281. The significance of effect on non-native and ornamental hedgerows is **negligible** due to their limited local value and them not being a priority habitat, which is **not significant** in EIA terms.

23.7.1.8 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Great Crested Newts

282. The potential impacts presented below represents a worst-case scenario where GCN are assumed to be present and breeding in all water bodies which had their HSI assessed, as eDNA surveying has not yet taken place at the time of writing. A total of 42 ponds were identified within the Onshore Development Area with two considered to be of 'excellent' suitability for GCN, seven of 'good' suitability, three of 'average' suitability, 17 of 'below average' suitability, and 13 considered to be of 'poor' suitability.

283. The accepted terrestrial home range of GCN is 250m from their breeding ponds, with individuals occurring infrequently 500-1,000m. The Onshore Development Area offers relatively limited and localised potential terrestrial habitat for the species and considering the presence of extensive areas of similar habitats in the wider landscape, it was concluded that any GCN populations associated with the waterbodies and ditches located 250m up to 500m from the Onshore Development Area boundary would likely not be exclusively dependent on the terrestrial habitats within the Onshore Development Area (further detail is available in **Volume 2, Appendix 23.3 Great Crested Newt Technical Advice Note**).

284. There is potential for construction activities to result in the long-term and temporary loss of GCN aquatic and terrestrial habitats such as breeding ponds, rough grassland, hedgerows, scrub and woodland.

285. Long-term loss of terrestrial habitats will occur within either OCS zone options in order to facilitate the temporary construction and permanent areas required for the OCS and ESBI. As described in **Section 23.7.1.7** above, OCS Zone 8 has approximately 2.86km of native hedgerow, and OCS Zone 4 contains 2.19km of native hedgerow, a habitat commonly used by GCN when outside of their breeding ponds.

286. In addition, along the onshore ECC and at the landfall, some minor habitat loss may be required to make way for the permanent footprint of link boxes, which may include habitats suitable for GCN. The exact quantum of habitat loss and location of the link boxes is unknown at this stage of design. However, the maximum long term habitat loss is anticipated to be no greater than 1ha with respect to the link boxes at the landfall and along the onshore ECC, and therefore, potential effects are anticipated to be negligible.

287. Sections of hedgerows and trees which are removed will be replaced during reinstatement post-construction by replanting with more diverse and locally appropriate native species. Adaptive management measures to mitigate the effects of climate change on mitigation / replacement planting will be considered to ensure reinstated habitats are effectively established (Commitment ID CO59). Aftercare of mitigation planting will be undertaken during the establishment period for a total of five years in which all planting will be monitored and maintained to ensure good establishment. Indicative activities, timeframes and roles and responsibilities during the establishment period will be set out in the LMP developed post-consent for the relevant stage of construction works (Commitment ID CO65). Therefore, losses of terrestrial habitats will only temporarily affect GCN during construction.

288. Several ponds with potential for supporting breeding GCN are present along the onshore ECC, and are at risk of being disturbed during construction, which may result in GCN no longer using them as a breeding resource post-development. If these ponds are confirmed to support GCN, they would qualify as priority habitat. Avoidance of and minimisation of impacts to priority habitats, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details). As a result, direct impacts to GCN breeding ponds will be minimised by design.

289. As part of embedded mitigation measures described in **Table 23-5**, all areas of land temporarily disturbed during construction will be reinstated to pre-existing conditions as far as reasonably practicable. Such reinstatement will commence as soon as practicable following completion of the relevant section of works in the area (Commitment ID CO100). A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit GCN.

290. There is also potential for the direct mortality of GCN to occur as a result of construction activities such as through movement and operations of plant and equipment.

23.7.1.8.1 Receptor Importance

291. GCN are a priority species, so the importance of the receptor is therefore considered to be **high**.

23.7.1.8.2 Impact Magnitude

292. The worst-case scenario of long-term GCN habitat loss would result in both short- and long-term impacts for GCN, but these impacts are not likely to adversely affect GCN population integrity or conservation status. The magnitude of impact is therefore considered to be **medium**.

23.7.1.8.3 Effect Significance

293. The significance of effect is deemed to be **moderate adverse**, which is **significant** in EIA terms.

23.7.1.8.4 Additional Mitigation and Residual Effect

294. As impacts may occur to habitats within 250m of GCN breeding ponds, EPS licencing may be required by the Project. This can be obtained via:

- A mitigation licence, which would include further surveys, monitoring and appropriate mitigation measures prior to and during construction;
- Through a District Level Licence (DLL) where funding is provided to Natural England to provide targeted GCN compensation at a district level outside of the Onshore Development Area; or
- Through a GCN Low Impact Class Licence if proposed activities will only have a minimal impact on GCN and their habitats. This is suitable for projects where the impact on GCN is minimal and can be managed with straightforward mitigation measure.

295. Depending on the impact on breeding ponds, compensatory pond creation may also be required in order to restore and potentially enhance breeding resources for GCN within the Onshore Development Area.

296. Further mitigation to prevent the direct mortality of GCN may include inspections of plant and equipment, use of exclusion fencing around construction areas, and the translocation of GCN away from active construction areas to a suitable receptor site.

297. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **negligible**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.9 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Badgers

298. During construction, there is potential for existing badger setts within the Onshore Development Area to be disturbed or destroyed. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified one active badger sett and two potential setts within the Onshore Development Area, which could be disturbed or destroyed by construction activities. Damage and disturbance could also occur during construction to foraging habitats and commuting routes.

299. Embedded mitigation measures have been included to ensure a reduction in direct disturbance to badgers potentially present within and nearby the Onshore Development Area. Provision will be made for badger access in relevant construction areas, when work is not taking place in order to ensure normal movements as far as reasonably practicable in the Outline EcoMP, including avoiding the entrapment of badgers (Commitment ID CO87). Construction lighting will only operate where necessary and will be directed away from sensitive ecological receptors where possible (Commitment ID CO85). Though measures to reduce noise and vibration, which are detailed within **Chapter 25 Noise and Vibration,** and will be embedded in the CNVMP (Commitment ID CO70), are primarily concerned with human receptors, there is inherent potential for incidental benefits to badgers through reduced effects from noise and vibration. The Outline EcoMP will also include details of necessary pre-construction badger surveys.

300. No evidence of badger activity was recorded within either of the OCS zone options, with the majority of the evidence of badger – such as potential setts, snuffle holes and suitable habitat – being recorded along the western half of the onshore ECC. The potential badger setts and associated habitats within the onshore ECC are mostly linked with hedgerows. Within the embedded mitigation measures set out in **Table 23-5**, hedgerow sections to be removed will be kept to a minimum distance as required for construction works, and where possible, hedgerows will be retained (Commitment ID CO59). This will assist in mitigating against badger disturbance.

301. Sections of hedgerows and trees which are removed will be appropriately replaced during reinstatement post-construction by replanting with more diverse and locally appropriate native species. Adaptive management measures to mitigate the effects of climate change on mitigation / replacement planting will be considered to ensure reinstated habitats are effectively established (Commitment ID CO59) (as discussed in **Section 23.7.1.8**).

302. Agricultural fields and woodlands were also identified during in **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report** as having suitability for sett creation and badger foraging activity.

303. The onshore ECC goes through a number of woodlands which could be used by badgers for foraging and sett creation, however, as discussed in **Section 23.7.1.2**, avoidance of and minimisation of impacts to priority habitats, including woodlands, where possible, was adopted as a principle in the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (see **Chapter 5 Site Selection and Consideration of Alternatives** for more details). This would minimise the likelihood of woodlands being adversely impacted by construction works within the onshore ECC.

304. As part of embedded mitigation measures described in **Table 23-5**, all areas of land temporarily disturbed during construction will be reinstated to pre-existing conditions as far as reasonably practicable. Such reinstatement will commence as soon as practicable following completion of the relevant section of works in the area (Commitment ID CO100). This will minimise the impact upon badgers making use of woodland and agricultural areas for foraging. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit badgers.

305. Indicative activities, timeframes and roles and responsibilities during the establishment period will be set out in the LMP developed post-consent for the relevant stage of construction works (Commitment ID CO65). However, once the hedgerow has been removed and the area has been disturbed, the badger sett will have been irreversibly disturbed, which is why species-specific surveying is vital to ensure active setts are avoided as much as possible.

23.7.1.9.1 Receptor Importance

306. Despite not considered as a priority species, badgers and their setts are protected by law making it illegal to intentionally capture, kill or injure badgers or interfere with their setts. Badgers are considered to be a fairly resilient species with the ability to tolerate the potential impacts of this development. They have some ability to tolerate the potential impacts from the projects and could potentially recover to an acceptable status over a ten-year period.

307. The importance of the receptor is therefore considered to be **medium.**

23.7.1.9.2 Impact Magnitude

308. The worst-case scenario for badgers within the Onshore Development Area is that sett(s) located within the Onshore Development Area classed as main sett(s) would need to be destroyed. Whilst this would result in direct impacts on local population(s), it is unlikely that the conservation status or population integrity of badgers in the UK overall would be affected.

309. The magnitude of impact is therefore considered to be **medium adverse.**

23.7.1.9.3 Effect Significance

310. Professional judgement and species-specific knowledge have been applied to determine the overall significance of potential effects on badgers within and around the Onshore Development Area.

311. Overall, it is predicted that importance of the receptor is **medium,** and the magnitude of impact is **medium**. The effect is therefore of **moderate adverse** significance, which is **significant** in EIA terms.

23.7.1.9.4 Additional Mitigation and Residual Effect

312. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage.

313. Under the conditions of a worst-case scenario, pre-construction badger surveys will be required to confirm the presence or likely absence of badger setts from within the Onshore Development Area and 30m of any construction works. In the event a badger sett is identified, additional mitigation may be required, which may include some of the following measures:

- Main sett replacement in an appropriate mitigation area, and a licence for the closure of the on-site sett;
- Six months prior to the closure of a sett, a replacement sett must be prepared and badgers must be shown to have used the replacement sett prior to the closure of the existing sett;
- Bait marking surveys may be used to determine if the artificial sett is being built within another clan's territory; and
- Closure of setts may only take place between 1st July and 30th November.

314. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **low**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.10 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Roosting Bats

315. During construction, there is potential for bat roosts within the Onshore Development Area to be disturbed. Based on the results of the desk study and PEA report **(Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**), the bat species foraging and possibly roosting within the Onshore Development Area are likely to be common pipistrelle, soprano pipistrelle, myotis, natterers and brown long eared.

316. OCS Zone 8 is bordered by a number of mature trees which have been identified in the PEA surveys as having potential roost features, and an area of woodland adjacent to the northern boundary of OCS Zone 8 has been recommended to have a ground level tree assessment carried out on the whole area. Development within Zone 8 could therefore put roosting bats at risk of disturbance. OCS Zone 4 did not have any potential roost features (PRF) identified within or adjacent to its boundaries.

317. The following embedded mitigation measures, as described in **Table 23-5** (and elaborated upon in **Section 23.7.1.8** and **Section 23.7.1.9**), also applies to reduce the impact of the Project upon both bats and woodland habitats and trees potentially containing PRF:

- Avoidance of and minimisation of impacts to ancient woodlands and priority habitats during the site selection process (see **Chapter 5 Site Selection and Consideration of Alternatives**);
- Reinstatement of temporarily disturbed habitats (Commitment ID CO100);
- CNVMP (Commitment ID CO70);
- Selected trees to be fenced off with root protection zones (Commitment ID CO59); and
- Construction lighting to be directed away from sensitive ecological receptors (Commitment ID CO85),

318. Embedded mitigation measures also state that all trees affected by construction works will need to be re-assessed for their suitability for roosting bat prior to construction commencing, and those with bat roost potential will be subjected to further survey in line with best practice guidelines (Commitment ID CO86).

319. Embedded mitigation measures included in the CNVMP (Commitment ID CO70) concerning the reduction of noise will also minimise the disturbance of roosting bats in the Onshore Development Area, as covered in **Chapter 25 Noise and Vibration.**

320. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit roosting bats.

23.7.1.10.1 Receptor Importance

321. Bats are a priority species and cannot legally be disturbed, with the same applying to structures and habitats that are being used for roosting.

322. The importance of the receptor is therefore considered to be **high**.

23.7.1.10.2 Impact Magnitude

323. The worst-case scenario would be for bat roosts to be disturbed or permanently lost during construction within the Onshore Development Area, and for roosting bats to be killed or injured in the process. Some bats roosts are considered to be more sensitive, including maternity roosts and transitional roosts, and are more likely to be disturbed by construction activities.

324. The disturbance of any roost would result in a direct impact which could be irreversible if the roost is subsequently abandoned.

325. Under the worst-case scenario, the magnitude of the impact could affect the conservation status of an individual species or bat species as a collective, but this is unlikely when factoring in the embedded mitigation measures described in this section. The magnitude is therefore considered to be **medium.**

23.7.1.10.3 Effect Significance

326. Professional judgement and species-specific knowledge have been utilised to determine the overall significance of potential effects on bats within and around the Onshore Development Area.

327. Overall, it is predicted that importance of the receptor is **high** and the magnitude of impact is **medium**. The effect is therefore of **major adverse** significance, which is **significant** in EIA terms.

23.7.1.10.4 Additional Mitigation and Residual Effect

328. Any trees or buildings, which could be affected by the Project, with bat roost suitability will require detailed Ground Level Tree Assessments (GLTA) and Preliminary Bat Roost Assessment (PBRA) surveys, which are to be carried out in 2025.

329. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP at ES stage. Potential mitigation measures to limit the effect on bats roosts could include the following:

- Avoid loss of habitat with suitable roost features such as woodland and trees, and avoid vegetation clearance of trees where possible; and
- Retain any known roosting sites.

330. Depending on the outcome of further bat surveys, an EPS mitigation licence may be required. The accompanying mitigation requirements outlined as part of the licence will be dependent upon the specific bat species and the type of roost that has been identified. General requirements may include:

- Installation of bat roost boxes nearby to compensate for any loss in roost capacity of the pre-existing roosts;
- Trees being 'soft-felled' by being cut and lowered to the ground gently using ropes, reducing any potential bat mortality; and
- Timing roost removals to times when they are much less likely to be in use e.g., removing a hibernation roost in summer months.

331. With the adoption of additional mitigation measures, the potential impacts may be up to a **low** magnitude. The residual effect therefore may be up to a **moderate adverse** significance, which is **significant** in EIA terms. It is expected that once the status of bats within and around the Onshore Development Area is known, more specific mitigation can be implemented through the ES which would ensure that residual effects are **minor adverse**, which is **not significant** in EIA terms.

23.7.1.11 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Foraging and Commuting Bats

332. During construction, there is potential for foraging and commuting bats within the Onshore Development Area to be disturbed, injured or killed. Based on the results of the desk study and PEA report (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**), the bat species present are likely to be common pipistrelle, soprano pipistrelle, myotis, natterers and brown long eared.

333. There are several habitats within the Onshore Development Area which are suitable for foraging and commuting bats, including hedgerows, woodlands and ponds. OCS Zone 4 consists primarily of open cropland, which is less suitable for commuting bats, and has 2.19km of native hedgerow. OCS Zone 8 is also mostly made up of open cropland, and is bordered by a number of woodland patches and has extensive hedgerows bordering the cropland throughout. OCS Zone 8 has approximately 2.86km native hedgerow.

334. The following embedded mitigation measures, as set out in **Table 23-5** and elaborated upon in **Section 23.7.1.8** and **Section 23.7.1.9**, will reduce the impact of the Project on foraging and commuting bats:

- Retention of hedgerows where possible and adaptive management measures for mitigation / replacement planting and reinstatement of temporarily disturbed habitats (Commitment IDs CO84 and CO100);
- Activities, timeframes, roles and responsibilities for effectively establishing habitats within the LMP (Commitment ID CO65);
- Where removal of hedgerows is required during construction and where determined to be required by a suitably qualified ecologist, moveable inserts / features may need to be deployed on a nightly basis to ensure commuting and foraging bats resources provided by hedgerows remain during construction, in line with the Outline EcoMP (Commitment ID CO88);
- A BNG Strategy will be developed post-consent (Commitment ID CO82);
- Construction lighting will only operate where necessary and will be directed away from sensitive ecological receptors where possible (Commitment ID CO85); and
- Embedded mitigation measures included in the CNVMP (Commitment ID CO70) concerning the reduction of noise will also minimise potential disturbance of foraging and commuting bats in the Onshore Development Area, as covered in **Chapter 25 Noise and Vibration.**

23.7.1.11.1 Receptor Importance

335. Bats are a priority species and cannot legally be disturbed.

336. The sensitivity of the receptor is therefore considered to be **high**.

23.7.1.11.2 Impact Magnitude

337. The worst-case scenario would be that foraging and commuting habitats would be lost in areas of high activity, particularly for more sensitive and / or rarer bat species, and for commuting and foraging bats to disturbed or killed as a result. This would be a direct and irreversible impact to the bats.

338. Foraging and commuting bats are particularly vulnerable if flight lines or significant and sensitive habitats are lost, this can lead to significant effects to populations.

339. However, the embedded mitigation measures described in this section reduces the severity of the potential impact, and therefore, magnitude of impact is considered to be **medium**.

23.7.1.11.3 Effect Significance

340. Professional judgement and species-specific knowledge have been utilised to determine the overall significance of potential effects on bats within and around the Onshore Development Area.

341. Overall, it is predicted that importance of the receptor is **high** and the magnitude of impact is **medium**. The effect is therefore of **major adverse** significance, which is **significant** in EIA terms.

23.7.1.11.4 Additional Mitigation and Residual Effect

342. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP developed at ES stage. Potential mitigation measures to limit the effect on bats, informed by the further surveys, could include the following:

- Further consideration of avoiding permanent and temporary loss of habitats which are identified as being of high importance to highly sensitive species of commuting and foraging bats (this may include areas of woodland, hedgerows and lines of trees); and
- Restriction on night-time working in specific sensitive locations (occasional night work may still be required).

343. With the adoption of additional mitigation measures, the potential impacts may be up to a **low** magnitude. The potential residual effect may be up to a **moderate adverse** significance, which is **significant** in EIA terms. It is expected that once the status of bats within and around the Onshore Development Area is known, more specific mitigation can be implemented through the ES which would ensure that residual effects are **minor adverse**, which is **not significant** in EIA terms.

23.7.1.12 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Overwintering and Passage Birds

344. The construction of the Project will affect suitable habitats for overwintering and passage birds. The OCS zones carry overwintering and passage bird assemblages that are typical of the surrounding area and main habitat types, i.e. productive arable farmland and pockets of mixed woodland. The relative impact of within each OCS zone is subject to findings of site-specific surveys. The onshore ECC and surrounding 2km buffer zone used as the Onshore Ornithology Desk Study Area has a wider assemblage that also includes most overwintering and passage waterbirds, birds of prey and passerines that are regularly-occurring in northern England, in small to locally-significant numbers.

345. On the basis of the outcomes of assessment of effects in **Chapter 20 Air Quality and Dust** and **Chapter 21 Water Resources and Flood Risk**, there is considered to be no potential impact from construction of the Project on overwintering and passage birds via air quality changes or via hydrological linkages. The potential impacts to overwintering and passage birds as a result of construction include:

- Direct injury or mortality of overwintering and passage birds;
- Direct disturbance and displacement of overwintering and passage birds;
- Temporary habitat loss for the duration of the construction works; and
- Permanent habitat loss (in the relatively small area where this occurs).

346. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including overwintering and passage birds.

347. Indirect impacts from drilling fluid breakout, pollution, changes in baseline air quality from traffic emissions and dust have the potential to occur on overwintering and passage birds. These indirect impacts will be temporary in nature, associated with the construction phase only. As described in **Table 23-5,** embedded mitigation measures will include the following measures to avoid and minimise potential impacts on overwintering and passage birds:

- A Drilling Fluid Breakout Management Plan (Commitment ID CO38), PPP (Commitment ID CO40), CNMVP (Commitment ID CO70) and AQMP (Commitment ID CO55) as part of the CoCP;
- Management of removal and replanting of hedgerows and trees and replacement and reinstatement of removed hedgerow and trees with more diverse and locally appropriate native species (Commitment ID CO59);

- Burial of onshore export cables with no requirement for overhead pylons (Commitment ID CO60);
- Minimising the permanent footprint of the OCS and ESBI (Commitment ID CO64);
- A BNG Strategy will be developed post-consent (Commitment ID CO82);
- Management of construction lighting (Commitment ID CO85); and
- Reinstatement of temporarily disturbed habitats (Commitment IDs CO100 and CO101).

23.7.1.12.1 Receptor Importance

348. Overwintering and passage birds in and adjacent (within 250m) to the Onshore Development Area have **medium importance** as it includes some species listed as BoCC5 red or amber or on Annex I of the Birds Directive or Schedule 1 of the WCA, occurring in low to locally important numbers. Overwintering and passage birds in and adjacent to the Onshore Development Area have **medium sensitivity** to the construction impacts, as the receptor has some ability to tolerate this effect or avoid the highest magnitude of the impact. The receptor may undergo a change in abundance or quality, but can partially adapt and recover to an acceptable status over one to 10 years.

23.7.1.12.2 Impact Magnitude

349. Overwintering and passage bird species are very likely to be present in hedgerow, woodland, field or waterbody habitats within or adjacent to the Onshore Development Area during the construction phase. However, following the embedded mitigation measures, construction would not alter the ability of most species and most individuals which occur in the baseline environment to undertake normal overwintering and passage behaviours including resting, foraging and migration. Instances of direct mortality would be exceptionally rare. Construction activities would have a **medium** adverse impact on overwintering and passage birds, as construction may adversely affect the ornithological receptor but would be unlikely to adversely affect its integrity or conservation status.

23.7.1.12.3 Effect Significance

350. Overall, it is predicted that importance and sensitivity of the receptor is **medium** and the magnitude of impact is **medium**. The effect is therefore of **moderate adverse** significance, which is **significant** in EIA terms.

23.7.1.12.4 Additional Mitigation and Residual Effect

351. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage. Additional mitigation will be determined on the basis of pre-construction surveys, and Ecological Clerk of Works (ECoW) oversight of construction works once initiated, which are themselves both embedded mitigation measures. Potential additional mitigation measures to limit the effect on specific overwintering and passage bird species, assemblages or populations if detected before or during construction could include the following:

- Avoid permanent and temporary loss of resting and foraging habitat wherever possible such as specific fields or waterbodies; and
- Reduction of noise and vibration disturbance e.g. installation of acoustic barriers, screening of permanent infrastructure.

352. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **low**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.13 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Breeding Birds

353. The construction of the Project will affect suitable habitats for breeding birds. The OCS zones support breeding bird assemblages that are typical of the surrounding area and main habitat types, i.e. productive arable farmland and pockets of mixed woodland. Within OCS Zone 4, there is possible breeding by barn owl, and confirmed breeding tree sparrow and starling (both BoCC5 red listed). Within OCS Zone 8, one record of a Schedule 1 species was returned within the desk study data since 2020 (barn owl) and historical presence of a further Schedule 1 species (red kite) which are possible breeders based on presence of individuals (see also **Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**).

354. The desk-study and a site-specific survey at the landfall have confirmed breeding of sand martin, plus tree sparrow which may occupy vacant sand martin burrows, and evidence of probable or possible breeding by ground-nesting grassland birds (meadow pipit, skylark). No breeding qualifying features of Greater Wash SPA (tern species) are frequent at the landfall whether foraging, resting or breeding.

355. The desk study of the onshore ECC and surrounding 2km buffer zone has identified confirmed breeding records of barn owl, marsh harrier and little ringed plover, (historically) hobby, and evidence of possible or probable breeding kingfisher, Cetti's warbler, and bittern, plus a wider breeding bird assemblage (the most notable or scarce species being yellow wagtail) that also includes breeding waterbirds and birds of prey that are regularly-occurring in northern England.

356. On the basis of the outcomes of assessment of effects in **Chapter 20 Air Quality and Dust** and **Chapter 21 Water Resources and Flood Risk**, there is considered to be no potential impact from construction of the project on breeding birds via air quality changes or via hydrological linkages. The potential impacts to breeding birds as a result of construction include:

- Direct injury or mortality of breeding birds or destruction of nests and eggs or chicks during construction;
- Direct disturbance and displacement of breeding birds;
- Temporary breeding habitat loss for the duration of the construction works; and
- Permanent breeding habitat loss.

357. An EcoMP will also be developed post-consent for each stage of construction works (Commitment ID CO81), which will set out mitigation and monitoring measures for the pre-construction, during construction and post-construction phases for habitats and relevant ecological receptors, including breeding birds (Commitment IDs CO90 and CO91).

358. Indirect impacts from drilling fluid breakout, pollution, changes in baseline air quality from traffic emissions and dust have the potential to occur on breeding birds. These indirect impacts will be temporary in nature, associated with the construction phase only. As described in**Table 23-5,** embedded mitigation measures will include the following measures to avoid and minimise potential impacts on breeding birds:

- A Drilling Fluid Breakout Management Plan (Commitment ID CO38), PPP (Commitment ID CO40), CNMVP (Commitment ID CO70) and AQMP (Commitment ID CO55) as part of the CoCP;
- Management of removal and replanting of hedgerows and trees and replacement and reinstatement of removed hedgerow and trees with more diverse and locally appropriate native species (Commitment ID CO59);
- A BNG Strategy will be developed post-consent (Commitment ID CO82);
- Sensitive timing of vegetation clearance works, and / or nesting bird checks prior to commencement of vegetation clearance works (Commitment ID CO84)
- Minimising the permanent footprint of the OCS and ESBI (Commitment ID CO64); and
- Reinstatement of temporarily disturbed habitats (Commitment IDs CO100 and CO101).

23.7.1.13.1 Receptor Importance

359. Breeding birds in and adjacent (within 250m) to the Onshore Development Area could include Schedule 1 species and so have **high** sensitivity to the construction impacts, i.e. the breeding species identified are unable to tolerate the potential impacts, with consequence of reduction in abundance or breeding condition.

23.7.1.13.2 Impact Magnitude

360. Breeding bird species are likely to be present in hedgerow, woodland, field or waterbody habitats within or adjacent to the Onshore Development Area during the construction phase, and at least one Schedule 1 species is recently recorded to breed in the area. With the implementation of the embedded mitigation measures, the magnitude of impacts will be **medium.**

23.7.1.13.3 Effect Significance

361. Overall, it is predicted that importance / sensitivity of the receptor is **high** and the magnitude of impact is **medium**. The effect is therefore of **major adverse** significance, which is **significant** in EIA terms.

23.7.1.13.4 Additional Mitigation and Residual Effect

362. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage. Potential additional mitigation measures to limit the effect on breeding birds could include the following:

- Reduction of noise and vibration disturbance to birds found to be nesting in vicinity of works e.g. installation of acoustic barriers, screening of permanent infrastructure; and
- Maintenance of a 100m or larger buffer of exclusion around the location of any barn owl nest, other Schedule 1 species' nest or bird of prey nest within the Onshore Development Area.

363. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **negligible**. The residual effect would therefore be of **minor adverse** significance, which **is not significant** in EIA terms.

23.7.1.14 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Protected Fish Species

364. During construction, there is potential for fish species within the Onshore Development Area to be disturbed, injured or killed. Based on the results of the desk study and PEA report, the protected fish species present are likely to be European eel, bullhead, lamprey species and brown / sea trout.

365. Baseline fish surveys have not been undertaken, therefore the worst-case scenario is that priority species are amongst the fish species assemblage. Neither OCS zones contain riparian freshwater habitat, however the onshore ECC crosses a number of watercourses. Where watercourses are crossed, there is potential for injury or mortality of fish in addition to temporary loss of habitat due to instream works. Fish species, some more so than others, are known to be sensitive to noise and vibration and may be affected during construction at watercourse crossings. However, the risk of injury or mortality occurring is typically associated with impulsive activities such as piling or explosions, and not continuous sources such as drilling (Popper *et al.*, 2014). There may however be temporary disturbance as a result noise and vibration during construction.

366. As part of embedded mitigation described in **Table 23-5**, all Main Rivers and Internal Drainage Board (IDB) maintained drains will be crossed using trenchless techniques with respect to the cable duct installation works (Commitment ID CO32) at a depth of at least 2m below channel bed (to the top of the duct / cable or otherwise) (Commitment ID CO36). Trenchless crossing entry and exit points are to be located at least 20m away from the bank of main rivers and at least 9m away from the bank of IDB maintained drains and ordinary watercourses (Commitment ID CO33). In cases where open cut trenching methods or temporary haul road watercourse crossings are required, measures will be employed to maintain water flow along the watercourse (Commitment ID CO35). A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit fish. These embedded mitigation measures will avoid or minimise impacts of the watercourse crossings on fish.

367. There is a possibility of fish species being adversely impacted by the pollutant effects of dust and other materials during construction, which will be mitigated against through the following elements of the CoCP, as described in **Table 23.5** (described in further detail in **Section 23.7.1.2**):

- WCMS (Commitment ID CO35);
- A Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- A PPP (Commitment ID CO40);
- A CNVMP (Commitment ID CO70); and
- An AQMP (Commitment ID CO55).

23.7.1.14.1 Receptor Importance

368. Protected fish species such as the European eel, lamprey and brown / sea trout are priority species.

369. The importance of the receptor is therefore considered to be **high**.

370. Moreover, fish species are considered to have **medium** sensitivity as they have some ability to tolerate the potential impacts and could potentially recover within a 10-year period.

23.7.1.14.2 Impact Magnitude

371. The worst-case scenario would be that fish species' integrity and conservation status are unlikely to be adversely affected.

372. Fish species are particularly vulnerable to injury or death from pollution events or through accidental sedimentation events. However, with the implementation of the embedded mitigation measures, the magnitude of impact is considered to be **low**.

23.7.1.14.3 Effect Significance

373. Professional judgement and species-specific knowledge have been utilised to determine the overall significance of potential effects on fish species within and around the Onshore Development Area.

374. Overall, it is predicted that importance of the receptor is **high,** it is of **medium** sensitivity and that the magnitude of the potential impact is **low.** The effect is therefore of **moderate adverse** significance, which is **significant** in EIA terms.

23.7.1.14.4 Additional Mitigation and Residual Effect

375. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP developed at ES stage. Potential mitigation measures to limit the effect on fish could include following pollution prevention guidance throughout the works, sensitive timing and removal of fish from areas to be dewatered.

376. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **negligible**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms. It is expected that once further details on the project design and construction parameters for the Onshore Development Area are known, more specific mitigation measures can be implemented through the ES which would ensure that residual effects are minor adverse.

23.7.1.15 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Invertebrates

377. There is potential for protected invertebrates and their habitat to be disturbed or lost during construction. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified invertebrates such as cinnabar moth caterpillar, butterflies, dragonflies, damselflies and ladybirds within the Onshore Development Area. The PEA surveys also identified suitable invertebrate habitat, including dead wood with small holes, hedgerows and ponds.

378. Hedgerows are significant for the population integrity of invertebrate species. OCS Zone 8 has approximately 2.86km of native hedgerow, whilst OCS Zone 4 has approximately 2.19km of native hedgerow, a habitat commonly used by invertebrates for feeding and breeding.

379. The following embedded mitigation measures, as set out in **Table 23-5** will reduce potential impacts of the Project on invertebrates: CO41, CO42, CO46, CO47, CO65, CO70, CO81, CO82, CO85, CO88, CO100 and CO101.

23.7.1.15.1 Receptor Importance

380. Priority invertebrates including cinnabar moth caterpillar, dragonflies and damselflies were found amongst the invertebrate assemblage within the Onshore Development Area during the PEA surveys. The importance of the receptor is therefore considered to be **high**.

381. However, given the mobile nature and widespread distribution of these species, their sensitivity is considered to be **medium.**

23.7.1.15.2 Impact Magnitude

382. With the implementation of embedded mitigation measures the magnitude of the impact is considered to be **low**.

23.7.1.15.3 Effect Significance

383. Overall, it is predicted that sensitivity of the receptor is **medium** and the magnitude of impact is **low**. The effect is therefore of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.16 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Otters

384. During construction, there is potential for otter and its associated habitats to be disturbed or lost, as the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified suitable otter habitat within the Onshore Development Area, including a network of ditches, large watercourses and large ponds.

385. None of the habitats identified as suitable for otters are present within either of the OCS zones.

386. The onshore ECC however, crosses the network of ditches, watercourses and ponds, which may be used by otter for holt creation and hunting. There is potential that temporary loss of watercourses (including other rivers and streams, canals and ditches) may occur during construction for those being crossed by open cut trenching methods for the cable duct installation works or where temporary haul road watercourse crossings are required. In such cases, temporary measures will be employed to maintain the flow of water along the watercourse, minimising changes to hydrological resources in the area (Commitment ID CO35). These measures may result in temporary disturbance and habitat loss for otters.

387. Indirect impacts from changes in hydrological connectivity, drilling fluid breakout, pollution, changes in baseline noise, air quality from traffic emissions and dust have the potential to occur on all freshwater habitats. These indirect impacts will be temporary in nature, associated with the construction phase only. They could, however, have direct effects upon otters if they are present within the watercourses at the time. As described in **Table 23-5** and **Section 23.7.1.1**, embedded mitigation measures will include the following measures as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39) to avoid and minimise potential indirect impacts on riparian and freshwater habitats thereby reducing indirect impacts on otters:

- WCMS (Commitment ID CO35);
- A Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- A PPP (Commitment ID CO40);
- A CNVMP (Commitment ID CO70); and
- An AQMP (Commitment ID CO55).

388. Embedded mitigation measures have been included to ensure a reduction in disturbance to otter potentially present within and nearby the Onshore Development Area. Construction lighting will only operate where necessary and will be directed away from sensitive ecological receptors where possible (Commitment ID CO85).

389. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit otters.

23.7.1.16.1 Receptor Importance

390. Otters are EPS which means they are protected under The Conservation of Habitats and Species Regulations 2017 against killing, injury and disturbance, in addition their breeding and resting habitats are also protected. They are also protected under the WCA (1981) and listed as a priority species. Otters are therefore a **high** importance receptor.

23.7.1.16.2 Impact Magnitude

391. Under the worst-case scenario, it is possible for otter breeding or resting sites to need to be disturbed during construction, which would carry a high level of disturbance for otter in the Onshore Development Area.

392. The magnitude of the impact is therefore considered to be **high**.

23.7.1.16.3 Effect Significance

393. Overall, it is predicted that importance of the receptor is **high** and the magnitude of impact is **high**. The effect is therefore of **major adverse** significance, which is **significant** in EIA terms.

23.7.1.16.4 Additional Mitigation and Residual Effect

394. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage. Potential mitigation measures to limit the effect on otters could include the following:

- Avoiding temporary and permanent loss of otter habitat where possible;
- Retain connectivity for otter via keeping permanent and temporary vegetation clearance to a minimum;
- Restriction on night-time working in specific sensitive locations (occasional night work may still be required) –;
- Use of directional and low-level lighting to reduce additional light spill into retained and adjacent habitats;
- Fencing off any excavations and providing a means of escape for otter where necessary; and
- In the worst-case scenario of otter breeding or resting sites needing to be disturbed, an EPS licence will be applied for.

395. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **negligible**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.17 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Reptiles

396. During the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) suitable hibernacula and habitats for reptiles were identified, although no reptiles where seen. The habitats included grassland, hedgerows and woodlands which could provide suitable shelter and foraging opportunities for reptile species. However, the majority of OCS Zone 4, OCS Zone 8 and onshore ECC comprise arable habitats which provide low suitability for reptiles.

397. OCS Zone 8 has approximately 2.86km of native hedgerow, whilst OCS Zone 4 has 2.19km of native hedgerow, a habitat commonly used by reptiles for sheltering and feeding. The following embedded mitigation measures, as described in **Table 23-5** (and elaborated upon in **Section 23.7.1.8** and **Section 23.7.1.9**), applies to reduce the impact of the Project upon both reptiles and woodland and hedgerow habitats:

- Avoidance of and minimisation of impacts to priority habitats during the site selection process (see **Chapter 5 Site Selection and Consideration of Alternatives**);
- Adaptive management measures for reinstating habitats and reinstatement of temporarily disturbed habitats (Commitment IDs CO59 and CO100);
- A BNG Strategy will be developed post-consent (Commitment ID CO82);
- Activities, timeframes, roles and responsibilities for effectively establishing habitats within the LMP (Commitment ID CO65); and
- Construction lighting to be directed away from sensitive ecological receptors where possible (Commitment ID CO85).

398. Embedded mitigation measures included in the CNVMP (Commitment ID CO70) concerning the reduction of noise will also minimise the disturbance of reptiles in the Onshore Development Area, as covered in **Chapter 25 Noise and Vibration**. During construction, a suitably qualified ECoW will be present to oversee habitat manipulation to discourage the presence of reptiles from construction areas (Commitment ID CO89).

23.7.1.17.1 Receptor Importance

399. All species of reptile which could be found within the Onshore Development Area are legally protected against intentional killing under Schedule 5 of the WCA (1981). The importance of reptiles is therefore considered to be **medium**.

23.7.1.17.2 Impact Magnitude

400. The worst-case scenario for reptiles would be for them to be killed or injured during construction, or for their habitat to be permanently or temporarily lost.

401. The magnitude of the impact is therefore considered to be **medium**.

23.7.1.17.3 Effect Significance

402. Overall, it is predicted that importance of the receptor is **medium** and the magnitude of impact is **medium**. The effect is therefore of **moderate adverse** significance, which is **significant** in EIA terms.

23.7.1.17.4 Additional Mitigation and Residual Effect

403. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage. Potential mitigation measures to limit the effect on reptiles could include the following:

- Avoiding temporary and permanent loss of reptile habitat where possible;
- Retain connectivity for reptiles via keeping permanent and temporary vegetation clearance to a minimum;
- Sensitive timing and methods used for clearance of suitable reptile habitat;
- Restriction on night-time working (occasional night work will be required); and
- Fencing off any excavations and providing a means of escape for reptiles where necessary.

404. In a worst-case scenario, translocation of reptiles to appropriate mitigation areas may be necessary. It may also be necessary to undertake habitat replacement and enhancement to mitigate the effects of habitat loss which be detailed further within the Outline EcoMP.

405. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **low**. The residual effect would therefore be of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.18 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Water Voles

406. During construction, there is potential for water vole and their associated habitats to be disturbed or lost, as the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified suitable water vole habitat within the Onshore Development Area, including a network of ditches.

407. None of the habitats suitable for water vole are present within either of the OCS zones.

408. The onshore ECC however, crosses a network of ditches, watercourses and ponds, which may be used by water voles for foraging, dispersal and breeding. There is potential that, during the construction phase, where watercourses are crossed by open cut trenching methods for the cable duct installation works or where temporary haul road watercourse crossings are required, this may result in temporary disturbance or losses of water vole habitat. In such cases, temporary measures will be employed to maintain the flow of water along the watercourse, minimising changes to hydrological resources in the area (Commitment ID CO35). These measures may result in temporary disturbance and habitat loss for water vole.

409. Indirect impacts from changes in hydrological connectivity, drilling fluid breakout, pollution, changes in baseline noise, air quality from traffic emissions and dust have the potential to occur on all freshwater habitats. These indirect impacts will be temporary in nature, associated with the construction phase only. They could, however, have direct effects upon water vole if they are present within the watercourses at the time. As described in **Table 23-5** and **Section 23.7.1.1**, embedded mitigation measures will include the following measures as part of the CoCP developed post-consent for each stage of construction works (Commitment ID CO39) to avoid and minimise potential indirect impacts on riparian and freshwater habitats thereby reducing indirect impacts on water voles:

- WCMS (Commitment ID CO35);
- A Drilling Fluid Breakout Management Plan (Commitment ID CO38);
- A PPP (Commitment ID CO40);
- A CNVMP (Commitment ID CO70); and
- An AQMP (Commitment ID CO55).

410. Embedded mitigation measures have been included to ensure a reduction in direct disturbance to water vole potentially present within and nearby the Onshore Development Area. Construction lighting will only operate where necessary and will be directed away from sensitive ecological receptors where possible (Commitment ID CO85).

411. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which may benefit water voles.

23.7.1.18.1 Receptor Importance

412. Water voles are protected under the WCA (1981) against intentional killing and their resting places are protected against intentional or reckless disturbance, obstruction or destruction. They are also a priority species. Therefore, they are of **high** importance.

23.7.1.18.2 Impact Magnitude

413. Under a worst-case scenario, during the construction phase the impact upon water vole could result in killing of individual water vole, or the destruction or disturbance of their habitat. Water voles tend to have small ranges, which would amplify the magnitude of the impact of their habitat being destroyed or disturbed. This would have an adverse effect on the integrity of the species assemblage.

414. The magnitude of impact is therefore considered to be **high**.

23.7.1.18.3 Effect Significance

415. Overall, it is predicted that importance of the receptor is **high** and the magnitude of impact is **high**. The effect is therefore of **major adverse** significance, which is **significant** in EIA terms.

23.7.1.18.4 Additional Mitigation and Residual Effect

416. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP to be developed at ES stage. Potential mitigation measures to limit the effect on water vole could include the following:

- Avoiding temporary and permanent loss of water vole habitat where possible;
- Retain connectivity for water vole via keeping permanent and temporary vegetation clearance to a minimum;
- Fencing off any excavations and providing a means of escape for water vole where necessary;
- Following pollution prevention guidance to protect relevant waterways;
- Enhancing retained areas of suitable water vole habitat; and
- In the worst-case scenario, where water vole could be at risk of being killed or their habitats destroyed, disturbed or obstructed, a suitable mitigation licence will be required. As part of this, the translocation of water vole to suitable receptor areas may be required.

417. With the adoption of additional mitigation measures, the magnitude of impact is anticipated to be **low**. The residual effect would therefore of **minor adverse** significance, which is **not significant** in EIA terms.

23.7.1.19 Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Other Protected Species

418. During construction, there is potential for brown hare and hedgehogs, as identified in the PEA report (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**), to have their habitats disturbed or lost. Suitable habitats within the Onshore Development Area includes woodland, hedgerows, scrub and grassland.

419. OCS Zone 8 has approximately 2.86km of native hedgerow, whilst OCS Zone 4 has 2.19km of native hedgerow, a habitat commonly used by hedgehogs for sheltering and foraging.

420. Grassland within the onshore ECC, including arable fields in which brown hare were seen during the PEA surveys, are likely to be temporarily disturbed during construction. Within the OCS zone, regardless of whether OCS Zone 8 or Zone 4 is selected, some arable field habitat will be lost, however, this habitat is widespread in the surrounding area and should not have any significant adverse impact on the population integrity of brown hare.

421. The onshore ECC goes through a number of woodlands which could be in use by hedgehogs and brown hare for sheltering and foraging, however, as discussed in **Section 23.7.1.2**, there are a number of embedded mitigation measures which significantly reduce the likelihood of woodland being adversely impacted by construction works within the onshore ECC. The following embedded mitigation measures, as described in **Table 23-5** (and elaborated upon in **Section 23.7.1.8** and **Section 23.7.1.9**), applies to drastically reduce the impact of the Project upon brown hare and hedgehogs:

- Avoidance of and minimisation of impacts to priority habitats during the site selection process (see **Chapter 5 Site Selection and Consideration of Alternatives**);
- Adaptive management measures for reinstating habitats and reinstatement of temporarily disturbed habitats (Commitment IDs CO59 and CO100); and
- CNVMP (Commitment ID CO38);
- A BNG Strategy will be developed post-consent as noted in (Commitment ID CO82);
- Activities, timeframes, roles and responsibilities for effectively establishing habitats within the LMP (Commitment ID CO65); and
- Construction lighting to be directed away from sensitive ecological receptors where possible (Commitment ID CO85).

422. Receptor Importance

423. As priority species, the importance of brown hare and hedgehogs is considered to be **high**.

23.7.1.19.1 Impact Magnitude

424. The worst-case scenario for the impact upon brown hare would be that existing burrow networks are disturbed by construction and hare have to move out of the Onshore Development Area. Brown hare tend to have large range sizes, meaning it is likely that any brown hare disturbed by construction-related activities will recover quickly from the disturbance and re-establish their burrows elsewhere the surrounding area, meaning little effect would be felt to the species assemblage.

425. Similarly, the worst-case scenario for the impact of construction upon hedgehogs is the destruction of habitat used for sheltering and foraging. However, of the habitats recorded within the Onshore Development Area, hedgerows and woodlands provide the greatest opportunities. These habitats are anticipated to be mostly retained during the construction phase and any losses will be subject to replacement planting under (Commitment ID CO100).

426. The magnitude of the impact is therefore considered to be **negligible**.

23.7.1.19.2 Effect Significance

427. The importance of the receptor is **high**, and the magnitude of the impact is **negligible**, the significance of effect for the disturbance of other protected species is therefore considered to be **minor adverse**, which is **not significant** in terms of EIA.

23.7.1.20 Spread of Invasive Non-Native Species (ECO-C-04)

428. Seven INNS, including yellow archangel, cotoneaster and *Montbretia Crocosmia x crocosmiiflora* were identified during the PEA surveys within the Onshore Development Area (as detailed within **Section 23.6.1.3.5**).

429. During the construction phase, INNS can be spread through displacement / movement / disposal of organic matter and contamination of equipment / machines / vehicle tyres or tracks / contractor clothing.

430. The spread of any potential INNS will be controlled through measures to be detailed within the Outline EcoMP to be developed at ES stage (Commitment ID CO81), which will include measures such as the cleaning of machinery, equipment and clothing after use to prevent INNS being transferred across and beyond the Onshore Development Area and the early identification of INNS present at the time of construction by ECoW.

431. The following embedded mitigation measures are also relevant to reducing the spread of INNS through watercourses, soil disturbance and other construction activities:

- Main rivers and IDB maintained drains to be crossed using trenchless techniques with respect to cable duct installation works (Commitment ID CO32);
- Trenchless crossing entry and exit points to be located at least 20m away from the bank of main rivers and at least 9m away from the bank of IDB maintained drains and ordinary watercourses (Commitment ID CO33);
- WCMS (Commitment ID CO35) and Soil Management Plan (Commitment ID CO46) as part of the CoCP;
- Hydrogeological risk assessment to be undertaken at each trenchless crossing location and where construction works have the potential to affect groundwater resources (Commitment ID CO42); and
- Topsoil and subsoil to be stored in separate stockpiles and assessed for contamination and disturbance (Commitment ID CO47).

23.7.1.20.1 Receptor Importance

432. A number of the INNS recorded within the Onshore Development Area are legally controlled under Schedule 9 of the WCA (1981).

433. If INNS were to be spread during construction activities, there is potential for breach of the WCA (1981) and degradation of native habitats or species. This could result in a long-term adverse impact within the local area. As a result, the importance of this receptor is **medium**.

23.7.1.20.2 Impact Magnitude

434. Considering the proposed embedded mitigation measures, the INNS which have been identified within the Onshore Development Area are unlikely to be spread, and relevant legislation is likely to be fully adhered to. Therefore, the magnitude of this impact would be **negligible.**

23.7.1.20.3 Effect Significance

435. Overall, it is predicted that importance of the receptor is **medium** and the magnitude of impact is **negligible**. The effect is therefore **negligible** significance, which is **not significant** in EIA terms.

23.7.2 Potential Effects during Operation

436. Once constructed, there is the potential for adverse effects arising from O&M activities associated with the Project in the context of onshore ecological receptors. Those impacts that may occur are detailed below.

23.7.2.1 Direct Impacts to Designated Ecological Sites (ECO-O-01)

437. The OCS and ESBI will be unmanned assets with no permanent on-site personnel presence. However, routine inspections and maintenance requiring temporary personnel presence will occur throughout the O&M phase within the OCS zone. It is considered that these activities will have no direct effect on ecological receptors. Any effects on onshore ecology receptors will be limited to temporary indirect disturbance to the adjacent habitats and species, including those potentially associated with ecological designated sites.

438. The total long term land take associated with the link boxes at the landfall and within the onshore ECC will be <1ha. Given micro-siting and trenchless installation techniques will be used for cable duct installation works at crossings of LWS (Commitment ID CO83), placement of link boxes at these locations will also avoid the LWS and therefore direct impacts during operation. No other designated sites have potential to be directly impacted by the placement of link boxes, as they are located outside of the landfall and onshore ECC.

439. Maintenance of the onshore export cable and landfall infrastructure is expected to be minimal. Routine non-intrusive inspection works are anticipated to consist of a visit to link box locations every six months for cable joint inspection and monitoring. Periodic testing of onshore export cables is likely to be required every six months, which would be undertaken at defined inspection points along the onshore ECC.

440. Unplanned emergency maintenance works to address faults will be undertaken as required, and depending on the nature of the repair, may involve intrusive works such as the excavation of the TJB / jointing bays, removal of faulty equipment and installation of replacement spare parts. Any reactive repairs to buried cables, in the unlikely event of a cable failure, will have fewer potential impacts to those of construction (**Section 23.7.1**), as they would be localised, of small scale and temporary in nature.

441. No losses of habitats which may be associated with ecological designated sites are anticipated to occur during maintenance activities.

442. During the operation of the OCS Zone 8, there is a low risk that operational noise and lighting may result in disturbance and / or illumination of adjacent designated sites, namely Fishpond Wood, Risby Estate LWS and Risby Park LWS. No designated ecological sites are directly adjacent to the OCS Zone 4 and therefore indirect impacts are unlikely to occur from operational noise or lighting on nearby ecological designated sites.

443. Operational lighting (with the exception of low-level, motion-sensor security lighting) at the OCS zone will only operate when required for O&M activities during low light conditions. Operational lighting will be designed in accordance with the latest relevant available guidance and legislation and to minimise light spill into the surrounding landscape and effects on ecological receptors. Details of the height location, design and luminance of operational lighting will be provided as part of detailed design (Commitment ID CO66).

444. An operational noise investigation protocol will be developed and implemented for the OCS and ESBI, which will require an assessment of operational noise and a monitoring programme to measure noise levels during operation to ensure specified limits are not exceeded at identified noise sensitive receptors (Commitment ID CO71).

445. The following embedded mitigation measures are also relevant to ECO-O-01 to avoid and minimise direct impacts to designated ecological sites during operation:

- All onshore export cables will be buried underground, with no overhead pylons (Commitment ID CO60);
- Jointing bays along the onshore ECC and the TJB at landfall will be buried underground (Commitment ID CO61);
- Detailed design of the OCS and ESBI will minimise the overall height and massing of associated structures and buildings (Commitment ID CO64);
- The Design Vision submitted as part of the application for development consent will set out design principles to ensure good design with respect to aesthetic, functionality and sustainability considerations (Commitment ID CO63);
- Avoidance of and minimisation of impacts to designated ecological sites during the site selection process (see **Chapter 5 Site Selection and Consideration of Alternatives**);
- Development of the EcoMP (Commitment ID CO81); and
- Micro-siting and trenchless crossing techniques to be used for cable duct installation works at crossings of LWS (Commitment ID CO83).

23.7.2.1.1 Receptor Importance

446. All statutory designated sites are considered to be of **high** importance.

447. All non-statutory designated sites are considered to be of **medium** importance.

23.7.2.1.2 Impact Magnitude

448. The magnitude of the operational impacts on designated sites is considered to be **negligible**, as the O&M activities are localised, temporary and unlikely to adversely affect the designated features of the designated ecological sites.

23.7.2.1.3 Effect Significance

449. Overall, it is considered that the importance of statutory designated sites is **high** and non-statutory designated sites is **medium**. The magnitude of impact is **negligible**. The significance of effect for all statutory and non-statutory designated sites will be **minor adverse**, which is **not significant** in EIA terms.

23.7.2.2 Direct Impacts to Habitats (ECO-O-02)

450. Due to the permanence of the OCS and ESBI, some of the habitat losses associated with the construction phase will be carried through to the O&M phase as impacts of the Project. In addition, along the onshore ECC and at the landfall, some minor habitat loss may be required to make way for the permanent footprint of link boxes. The exact quantum of habitat loss and location of the link boxes is unknown at this stage of design. However, the maximum long term habitat loss is anticipated to be no greater than 1hawith respect to the link boxes at the landfall and along the onshore ECC, and therefore, potential effects are anticipated to be negligible. These long-term habitat losses have been discussed in **Section 23.7.1**, as the impact occurs at construction.

451. Routine inspections and maintenance involving temporary personnel presence will occur throughout the O&M phase within the OCS zone. However, these activities will have no direct effect on ecological receptors. Any effects on onshore ecology receptors will be limited to temporary indirect disturbance to the adjacent habitats.

452. Maintenance of the onshore export cable and landfall infrastructure is expected to be minimal, as discussed in **Section 23.7.2.1**, primarily involving routine, non-intrusive inspection works at link box locations. Any reactive repairs to buried cables, in the unlikely event of a cable failure, will have fewer potential impacts to those of construction (**Section 23.7.1**), as they would be localised, of small scale and temporary in nature. Avoidance and minimisation of impacts to priority habitats is adopted as a principle during the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (**Chapter 5 Site Selection and Consideration of Alternatives**). Jointing bays along the onshore ECC and the TJB at landfall will be buried underground (Commitment ID CO61). During site selection refinements, sensitive ecological areas such as priority habitats will be considered to inform the micro-siting of link boxes during detailed design post-consent away from these receptors where possible. This will be informed by ongoing design refinements and results of ecological surveys.

453. During the operation of the OCS and ESBI, there is a low risk that operational noise and lighting may result in disturbance and / or illumination of adjacent habitats. This is particularly relevant for OCS Zone 8, as there are several parcels of deciduous woodland priority habitat adjacent to OCS Zone 8.

454. Operational lighting (with the exception of low-level, motion-sensor security lighting) at the OCS zone will only operate when required for O&M activities during low light conditions. Operational lighting will be designed in accordance with the latest relevant available guidance and legislation and to minimise light spill into the surrounding landscape and effects on ecological receptors. Details of the height location, design and luminance of operational lighting will be provided as part of detailed design (Commitment ID CO66).

455. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which will include the maintenance and monitoring of BNG measures during operation.

23.7.2.2.1 Receptor importance

456. The importance of all priority habitats, including native and ‘other-native’ hedgerows, and ancient woodland within the Onshore Development Area is considered to be **high**.

457. All non-priority woodland habitats are considered to be of **medium** importance, due to their inherent ecological value but lack of designation or importance above county level.

458. Running waterbodies, namely other rivers and streams and canals, are deemed to be of **medium** importance, due to their inherent ecological value but lack of designation or importance above county level.

459. Standing waterbodies, namely ponds and ditches, are deemed to be of **low** importance, as their value is limited to a maximum of district level.

460. All other habitats within the Onshore Development Area are considered to be of **negligible** importance, due to their importance being restricted to a local level.

23.7.2.2.2 Impact Magnitude

461. The magnitude of the operational impacts on all habitats is considered to be **negligible**, as the operational maintenance activities are localised, temporary and unlikely to adversely affect notable or sensitive habitats.

23.7.2.2.3 Effect Significance

462. The importance of priority habitats and ancient woodland is **high**, and the magnitude of the impact is **negligible**, therefore the significance of effect on all priority habitats and ancient woodland is considered to be **minor adverse**, which is **not significant** in EIA terms.

463. The importance of all other habitats is **medium, low** or **negligible,** and the magnitude of the impact is **negligible,** therefore the significance of effect for all other habitats is considered to be **negligible**, which is **not significant** in EIA terms.

23.7.2.3 Direct and Indirect Impacts on Legally Protected Species (ECO-O-03)

464. Routine inspections and maintenance involving temporary personnel presence will occur throughout the O&M phase within the OCS zone. However, these activities will have no direct effect on ecological receptors. Any effects on onshore ecology receptors will be limited to temporary indirect disturbance to the adjacent species and associated habitats.

465. Maintenance of the onshore export cable and landfall infrastructure is expected to be minimal, as discussed in **Section 23.7.2.1**, primarily involving routine, non-intrusive inspection works at link box locations.

466. Any reactive repairs to buried cables, in the unlikely event of a cable failure, will have fewer potential impacts to those of construction (**Section 23.7.1**), as they would be localised, of small scale and temporary in nature. Avoidance and minimisation of impacts to priority habitats is adopted as a principle during the site selection process leading up to the identification of the Onshore Development Area and will also be applied during further site selection refinements at ES stage (**Chapter 5 Site Selection and Consideration of Alternatives**). During site selection refinements, sensitive ecological areas such as habitats associated with legally protected species will be considered to inform the micro-siting of link boxes during detailed design post-consent away from these receptors where possible. This will be informed by ongoing design refinements and results of ecological surveys.

467. During the operation of the OCS and ESBI, there is a low risk that operational noise and lighting may result in disturbance and / or illumination of adjacent habitats and species.

468. Operational lighting (with the exception of low-level, motion-sensor security lighting) at the OCS zone will only operate when required for O&M activities during low light conditions. Operational lighting will be designed in accordance with the latest relevant available guidance and legislation and to minimise light spill into the surrounding landscape and effects on ecological receptors. Details of the height location, design and luminance of operational lighting will be provided as part of detailed design (Commitment ID CO66).

469. An operational noise investigation protocol will be developed and implemented for the OCS and ESBI, which will require an assessment of operational noise and a monitoring programme to measure noise levels during operation to ensure specified limits are not exceeded at identified noise sensitive receptors (Commitment ID CO71).

470. The O&M phase will result in emission of low-energy electro-magnetic fields (EMF). Some species of fish are able to detect EMF and use them for navigation and to survey their surroundings (Gill and Bartlett, 2010) and therefore have the potential to be affected by the transmission of EMF where the onshore export cables cross watercourses. A detailed assessment of the effects of EMF on fish is presented in **Chapter 11 Fish and Shellfish Ecology**. It is generally considered that magnetic fields are used more by diadromous species during the long distance migrations in the sea, and that upon entering the river system other environmental cues become more useful. Studies by Marine Scotland Science (Armstrong *et al.*, 2015; Orpwood *et al.*, 2015) found no identifiable behavioural response from Atlantic salmon (which can be used as a proxy for other salmonids including brown trout) or European eel exposed to magnetic fields. In addition, transmission of EMF, and therefore the field strength which fish may be exposed to, is significantly reduced by burying cables (Normandeau, 2011), as proposed by the Project (Commitment ID CO36).

471. Impacts to species during the O&M phase will also be further mitigated through the development of the EcoMP (Commitment ID CO81), which will include the reinstatement of hedgerows and trees which were removed during construction where possible (Commitment ID CO59).

472. A BNG Strategy will be developed post-consent as noted in Commitment ID CO82, **Table 23-5**, which will include the maintenance and monitoring of BNG measures during operation.

23.7.2.3.1 Receptor importance

473. All legally protected species are considered to be of **high** importance due to their ecological value on a national and international scale.

23.7.2.3.2 Impact Magnitude

474. The magnitude of the operational impacts on all legally protected species is considered to be **negligible**, as the operational maintenance activities are localised, temporary and unlikely to adversely affect notable or sensitive habitats.

475. The target minimum burial depth for the onshore export cables at watercourse crossings of at least 2m below the channel bed to the top of the duct / cable (Commitment ID CO36) will significantly reduce the exposure of fish to EMF during operation, and impacts are considered to be **negligible**.

23.7.2.3.3 Effect Significance

476. The importance of the receptor is **high,** and the magnitude of the impact is **negligible,** therefore the significance of effect on all legally protected species is considered to be **minor adverse**, which is **not significant** in EIA terms.

23.7.2.4 Spread of Invasive Non-Native Species (ECO-O-04)

477. There is a low likelihood INNS could be spread during O&M activities through inadvertent introduction from elsewhere via vehicles, plant, personnel, seeds, planting stock or substrate. However, the spread of any potential INNS will be controlled through measures detailed within the Outline EcoMP (Commitment ID CO81). Therefore, the likelihood of INNS spread occurring is minimal.

23.7.2.4.1 Receptor importance

478. If INNS were to be spread during O&M activities, there is potential for harm to be caused to native habitats and species through habitat degradation, out-competition of habitat and predation. As a result, the importance of this receptor is **medium**.

23.7.2.4.2 Impact Magnitude

479. The magnitude of impact is **negligible**, as appropriate biosecurity measures with regard to INNS will be detailed within the EcoMP for O&M activities within the Onshore Development Area. Therefore, the risk for potential adverse effects on ecological receptors is minimal.

23.7.2.4.3 Effect Significance

480. The importance of the receptor is **medium**, and the magnitude of the impact is **negligible**, therefore the significance of effect for the spread of INNS during operation is considered to be **negligible**, which is **not significant** in EIA terms.

23.7.3 Potential Effects during Decommissioning

481. No decision has been made regarding the final decommissioning strategy for the onshore infrastructure, as it is recognised that regulatory requirements and industry best practice change over time.

482. Commitment ID CO56 (see **Table 23-5**) requires an Onshore Decommissioning Plan to be prepared and agreed with the relevant authorities prior to the commencement of onshore decommissioning works. This will ensure that decommissioning impacts on onshore ecology and ornithology receptors will be assessed in accordance with the applicable regulations and guidance at that time of decommissioning where relevant, with appropriate mitigation implemented as necessary to avoid significant effects.

483. The detailed activities and methodology for decommissioning will be determined later within the Project's lifetime, but would be expected to include:

- Deinstallation and removal of electrical equipment, buildings and other infrastructure for the OCS and ESBI;
- Removal of above-ground link boxes along the onshore ECC;
- Inspection of underground infrastructure to be left in-situ along the onshore ECC and at the landfall (i.e. TJB, jointing bays, underground link boxes, onshore export cables and ducting) to ensure they are safe to remain in place. If considered unsuitable to be left in-situ at the time of decommissioning, these components will be removed; and
- Site reinstatement and landscaping.

484. Whilst a detailed assessment of decommissioning impacts cannot be undertaken at this stage, for this assessment, it is assumed that decommissioning is likely to operate within the parameters identified for construction (i.e. any activities are likely to occur within the temporary construction working areas and require no greater amount or duration of activity than assessed for construction). The decommissioning sequence will generally be the reverse of the construction sequence. It is therefore assumed that decommissioning impacts would likely be of similar nature to, and no worse than, those identified during the construction phase.

23.7.4 Additional Mitigation Measures

485. Detailed surveys to fully establish the ecological baseline of the Onshore Development Area are ongoing. Therefore, the full extent of potential additional mitigation is unknown at the time of writing. However, reasonable worst-case scenarios have been considered within **Section 23.7.1**, with suitable potential additional mitigation measures provided. At the time of writing, it is not known if these measures would apply to OCS Zone 4, Zone 8, the onshore ECC or landfall alone or in combination.

486. More detailed, site-specific mitigation measures will be developed where required at ES stage and included in the Outline EcoMP submitted with the DCO application (see **Table 23-5**, Commitment ID CO81) to avoid and minimise adverse effects on relevant receptors to non-significant levels. The additional mitigation measures in the submitted Outline EcoMP will be informed and refined by the results of the outstanding ecological surveys and refinements to the Project Design Envelope.

487. In addition, mitigation licences may be required for protected species. Specific mitigation measures will also be set out within and secured by the appropriate licences. This will ensure compliance with relevant wildlife legislation and that impacts from the Project are mitigated to avoid adverse effects on the integrity of the species population.

488. **Table 23-30** outlines indicative additional mitigation measures, not covered by the embedded mitigation measures, which may be applied within the Onshore Development Area to reduce the significance of adverse effects described in **Section 23.7.** These measures will be further refined at ES stage following detailed surveys.

Table 23-30 Indicative Additional Mitigation Measures to Be Included in the Outline Ecological Management Plan

Outline EcoMP: Additional Mitigation Measures for Onshore Ecology and Ornithology (to be developed at ES stage)
GCN
As impacts may occur to habitats within 250m of GCN breeding ponds, EPS licencing may be required by the project. This can be obtained via: • A mitigation licence, which would include further surveys, monitoring and appropriate mitigation measures prior and during construction; • Through a District Level Licence (DLL) where funding is provided to Natural England to provide targeted GCN compensation at a district level outside of the Onshore Development Area; or • Through a GCN Low Impact Class Licence if proposed activities will only have a minimal impact on GCN and their habitats. It is suitable for projects where the impact on GCN is minimal and can be managed with straightforward mitigation measure. Depending on the impact on breeding ponds, compensatory pond creation may also be required in order to restore and potentially enhance breeding resources for GCN within the Onshore Development Area. Further mitigation to prevent the direct mortality of GCN may include inspections of plant equipment, use of exclusion fencing around construction areas, and the translocation of GCN away from active construction areas to a suitable receptor site.
Badger
Pre-construction badger surveys will be required to confirm the presence or likely absence of badger setts from within the Onshore Development Area and 30m of any construction works. In the event a badger sett is identified, additional mitigation may be required, which may include some of the following measures: • Main sett replacement in an appropriate mitigation area, and a licence for the closure of the on-site sett; • Six months prior to the closure of a sett, a replacement sett must be prepared and badgers must be shown to have used the replacement sett prior to the closure of the existing sett; • Bait marking surveys may be used to determine if the artificial sett is being built within another clan's territory; and • Closure of setts may only take place between 1st July and 30th November.
Roosting Bats
Any trees or buildings, which could be affected by the project, with bat roost suitability will require detailed Ground Level Tree Assessments (GLTA) and Preliminary Bat Roost Assessment (PBRA) surveys, which are to be carried out in 2025. Potential mitigation measures to limit the effect on bats roosts could include the following: • Avoid loss of habitat with suitable roost features such as woodland and trees, and avoid vegetation clearance of trees where possible; and • Retain any known roosting sites. Depending on the outcome of further bat surveys, an EPS Mitigation licence may be required. The accompanying mitigation requirements outlined as part of the licence will be dependent upon the specific bat species and the type of roost that has been identified. General requirements may include: • Installation of bat roost boxes nearby to compensate for any loss in roost capacity of the pre-existing roosts; • Trees being 'soft-felled' by being cut and lowered to the ground gently using ropes, reducing any potential bat mortality; and • Timing roost removals to times when they are much less likely to be in use e.g., removing a hibernation roost in summer months.
Foraging and Commuting Bats
Potential mitigation measures to limit the effect on bats could include the following: • Avoid permanent and temporary loss of commuting and foraging habitat wherever possible such as woodland, hedgerows and lines of trees; • Retain connectivity and flight paths for bats via keeping permanent and temporary vegetation clearance to a minimum; and • Restriction on night-time working (occasional night work will be required).
Overwintering and Passage Birds
Potential mitigation measures to limit the effect on overwintering and passage birds could include the following: • Avoid permanent and temporary loss of resting and foraging habitat wherever possible such as specific fields or waterbodies; and • Reduction of noise and vibration disturbance e.g. installation of acoustic barriers, screening of permanent

Outline EcoMP: Additional Mitigation Measures for Onshore Ecology and Ornithology (to be developed at ES stage)

infrastructure.

Breeding Birds

Potential mitigation measures to limit the effect on breeding birds could include the following:

- Ensuring ground nests of species are not impacted, by creating cordons as necessary following pre-construction checks of areas subject to works in the breeding season;
- Reduction of noise and vibration disturbance to birds found to be nesting in vicinity of works e.g. installation of acoustic barriers, screening of permanent infrastructure; and
- Maintenance of a 100m or larger buffer of exclusion around the location of any barn owl nest, other Schedule 1 species' nest or bird of prey nest within the Onshore Development Area.

Protected Fish Species

Potential mitigation measures to limit the effect on fish could include the following:

- Pollution prevention guidance throughout the works and removal of fish from areas to be dewatered.

Otters

Potential mitigation measures to limit the effect on otter could include the following:

- Avoiding temporary and permanent loss of otter habitat where possible;
- Retain connectivity for otter via keeping permanent and temporary vegetation clearance to a minimum;
- Restriction on night-time working (occasional night work will be required);
- Use of directional and low-level lighting to reduce additional light spill into retained and adjacent habitats;
- Fencing off any excavations and providing a means of escape for otter where necessary; and
- In the worst-case scenario of otter breeding or resting sites needing to be disturbed, an EPS licence will be applied for.

Reptiles

Potential mitigation measures to limit the effect on reptiles could include the following:

- Avoiding temporary and permanent loss of reptile habitat where possible;
- Retain connectivity for reptiles via keeping permanent and temporary vegetation clearance to a minimum;
- Sensitive timing and methods used for clearance of suitable reptile habitat;
- Restriction on night-time working (occasional night work will be required); and
- Fencing off any excavations and providing a means of escape for reptiles where necessary.

In a worst-case scenario, translocation of reptiles to appropriate mitigation areas may be necessary. It may also be necessary to undertake habitat replacement and enhancement to mitigate the effects of habitat loss.

Outline EcoMP: Additional Mitigation Measures for Onshore Ecology and Ornithology (to be developed at ES stage)

Water Voles

Potential mitigation measures to limit the effect on water vole could include the following:

- Avoiding temporary and permanent loss of water vole habitat where possible;
- Retain connectivity for water vole via keeping permanent and temporary vegetation clearance to a minimum;
- Restriction on night-time working (occasional night work will be required);
- Fencing off any excavations and providing a means of escape for water vole where necessary;
- Following pollution prevention guidance to protect relevant waterways; and
- Enhancing retained areas of suitable water vole habitat.

In the worst-case scenario where water vole could be at risk of being killed or their habitats destroyed, disturbed or obstructed, a translocation of water vole to suitable receptor areas may be required.

23.8 Cumulative Effects

489. Cumulative effects are the result of the impacts of the Project acting in combination with the impacts of other proposed and reasonably foreseeable developments on receptors. This includes plans and projects that are not inherently considered as part of the current baseline.

490. The overarching framework used to identify and assess cumulative effects is set out in **Chapter 6 Environmental Impact Assessment Methodology**. The four-stage approach is based upon the Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (Planning Inspectorate, 2024). The fourth stage of the process is the assessment stage, which is detailed within the sections below for potential cumulative effects on onshore ecology and ornithology receptors.

23.8.1 Screening for Potential Cumulative Effects

491. The first step of the CEA identifies which impacts associated with the Project alone, as assessed under **Section 23.7**, have the potential to interact with other plans and projects to give rise to cumulative effects. All potential cumulative effects to be taken forward in the CEA are detailed in **Table 23-31** with a rationale for screening in or out. Only impacts determined to have a residual effect of negligible or greater are included in the CEA. Those assessed as 'no change' are excluded, as there is no potential for them to contribute to a cumulative effect.

Table 23-31 Onshore Ecology and Ornithology – Potential Cumulative Effects

Impact ID	Impact and Project Activity	Potential for Cumulative Effects	Rationale
Construction			
ECO-C-01	Direct and indirect impacts to designated ecological sites – construction activities, such as trenching, excavation, piling and movement of plant and equipment	Yes	Other plans and projects have potential to have cumulative indirect effects on onshore designated sites where zones of influence overlap.
ECO-C-02	Direct impacts to habitats – construction activities, such as trenching, excavation and piling, and establishment of haul roads and temporary construction compounds resulting in temporary habitat loss, fragmentation and disturbance	Yes	Other plans and projects have potential to have cumulative permanent habitat loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.
ECO-C-03	Direct and indirect impacts on legally protected species – construction activities, such as trenching, excavation, piling and movement of plant and equipment, resulting in species disturbance and displacement	Yes	Other plans and projects currently have potential to have cumulative permanent impacts across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
ECO-C-04	Spread of invasive non-native species – construction activities, such as trenching, excavation, piling and movement of plant and equipment	Yes	Each project individually comes with a risk of spreading INNS but there will be no movement of construction vehicles between project sites, therefore the likelihood of significant cumulative effect is negligible.
Operation and Maintenance			
ECO-O-01	Direct and indirect impacts to designated ecological sites – routine and unplanned maintenance activities, such as unscheduled excavations and presence of above-ground infrastructure during operation	Yes	Other plans and projects currently have potential to have ongoing cumulative temporary direct and indirect disturbance if maintenance activities are undertaken simultaneously.
ECO-O-02	Direct impacts to habitats – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in temporary habitat loss, fragmentation and disturbance, and presence of above-ground infrastructure during operation with potential for long-term habitat loss, fragmentation and disturbance	Yes	Potential for cumulative effects to occur with other projects where they are located within the OCS zone.
ECO-O-03	Direct and indirect impacts on legally protected species – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in species disturbance and displacement, and presence of above-ground infrastructure during operation with potential for displacement and light or noise disturbance	Yes	There is potential for cumulative effects to ecological receptors, particularly on notable species and their habitats from operational noise and light impacts.
ECO-O-04	Spread of invasive non-native species – routine and unplanned maintenance activities such as unscheduled excavations	Yes	Each project individually comes with a risk of spreading INNS. There will be no movement of O&M vehicles between project sites, therefore the likelihood of a cumulative effect is negligible.
Decommissioning			
There is insufficient information available on other plans and projects which could have a spatial and temporal overlap with the Project's onshore decommissioning works. The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56). This will include a detailed assessment of decommissioning impacts and appropriate mitigation measures to avoid significant effects, including cumulative effects. For this assessment, it is assumed that cumulative decommissioning effects would be of similar nature to, and no worse than, those identified during the construction phase.			

23.8.2 Screening for Other Plans / Projects

492. The second step of the CEA identifies a short-list of other plans and projects that have the potential to interact with the Project to give rise to significant cumulative effects during the construction and O&M phases. The short-list provided in **Table 23-32** has been produced specifically to assess cumulative effects on onshore ecology and ornithology receptors. The exhaustive list of all onshore plans and projects considered in the development of the Project's CEA framework is provided in **Volume 2, Appendix 6.5 Cumulative Effects Screening Report - Onshore**.

493. Developments that were fully operational during baseline characterisation, including at the time of site-specific surveys, are considered as part of baseline conditions for the surrounding environment. It is assumed that any residual effects associated with these developments are captured within the baseline information. As such, these developments are not subject to further assessment within the CEA and excluded from the screening exercise presented in **Table 23-32**.

494. For developments that were not fully operational, including those in planning / pre-construction stages or under construction, during baseline characterisation and operational developments with potential for ongoing impacts, these are included in the screening exercise presented in **Table 23-32**.

495. The screening exercise has been undertaken based on available information on each plan or project up to and including 31st December 2024. Information has been obtained from the Planning Inspectorate's NSIP portal and ERYC planning portal. It is noted that further information regarding the identified plans and projects may become available between PEIR publication and DCO application submission or may not be available in detail prior to construction. The assessment presented here is therefore considered to be conservative at the time of PEIR publication. The list of plans and projects will be updated at ES stage to incorporate more recent information at the time of writing. Plans and projects identified in **Table 23-32** have been assigned a tier based on their development status, the level of information available to inform the CEA and the degree of confidence. A three-tier system based on the Planning Inspectorate Advice Note Seventeen has been adopted (Planning Inspectorate, 2024).

496. A 2km radius from the Onshore Development Area has been used as the ZoI to identify relevant plans and projects for the onshore ecology and ornithology CEA. This distance has been used to determine the initial list of projects considered for the CEA.

497. Each plan or project in **Table 23-32** has been considered on a case-by-case basis. Only plans and projects with potential for significant cumulative effects with the Project are taken forward to a detailed assessment, which are screened based on the following criteria:

- There is potential that a pathway exists whereby an impact could have a cumulative effect on a receptor;
- The impact on a receptor from the Project and the plan or project in consideration has a spatial overlap (i.e. occurring over the same area);
- The impact on a receptor from the Project and the plan or project in consideration has a temporal overlap (e.g., occurring at the same time);
- There is sufficient information available on the plan or project in consideration and moderate to high data confidence to undertake a meaningful assessment; and
- There is some likelihood that the residual effect (i.e. after accounting for mitigation measures) of the Project could result in significant cumulative effects with the plan or project in consideration.

498. The CEA for onshore ecology and ornithology has identified a total of two projects where significant cumulative effects could arise in combination with the Project. A detailed assessment of cumulative effects is provided in the section below.

Table 23-32 Short List of Plans / Projects for the Onshore Ecology and Ornithology Cumulative Effect Assessment

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Onshore ECC (km)	Closest Distance to OCS Zone 4 (km)	Closest Distance to OCS Zone 8 (km)	Potential for Significant Cumulative Effects	Rationale
A164 And Jock's Lodge Junction Improvement Scheme Adjacent to and South of Beverley Road (20/01073/STPLF)	Road Improvement Scheme	Under Construction	1	Construction: 2024 to 2026 Operation: 2027+	0.8	0.4	1.9	No	The road improvement project will be complete before the Project's construction works commence. Hence, there is no potential for temporal overlap of construction activities.
Creyke Beck Solar Farm (21/02335/STPLF)	Solar Farm	Approved	1	Construction: Unknown Operation: Unknown	0.3	1.0	1.6	No	There is a potential for a temporal overlap with construction of this project which could cause cumulative effects for ecological receptors. However, any ecological effects arising from the construction of a development of this scale are likely to be relatively minor and addressed at the project level. Furthermore, there is no spatial overlap between this project and the Project. Therefore, there is no potential for significant cumulative effects.
Dogger Bank A Offshore Wind Farm (EN010021)	Offshore Wind Farm	Operational	1	Operation: 2025+	0	0.50	2.66	No	There is some spatial overlap between the two projects, but Dogger Bank A is currently operational. Due to the small spatial scale of buried and above ground permanent infrastructure associated with Dogger Bank A and the Project, cumulative operational effects from are not anticipated.
Dogger Bank B Offshore Wind Farm (EN010021)	Offshore Wind Farm	Under Construction	1	Construction: 2020 to 2025 Operation: 2026+	0	0.50	2.66	No	Dogger Bank B will be operational during the construction phase of the Project. Therefore, no cumulative impacts on any shared receptors are predicted.
Dogger Bank South Offshore Wind Farms (EN010125)	Offshore Wind Farm	Examination	1	Construction: 2026 to 2033 Operation: 2034+	0	0.10	0.30	Yes	Due to the proximity of Dogger Bank South to the Project, there is the potential for cumulative effects of a direct / indirect nature on the receptors identified.

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Onshore ECC (km)	Closest Distance to OCS Zone 4 (km)	Closest Distance to OCS Zone 8 (km)	Potential for Significant Cumulative Effects	Rationale
Erection of 39 Dwellings at Land East of 30 Canada Drive (24/00410/PLF)	Residential Development	Pending consideration	1	Construction: Unknown	0.6	6.4	6.1	No	There is a potential for a temporal overlap with construction of these projects which could cause cumulative effects for ecological receptors. However, any ecological effects arising from the construction of a development of this scale are likely to be relatively minor and addressed at the project level. Furthermore, there is no spatial overlap between these projects and the Project. Therefore, there is no potential for significant cumulative effects.
Erection of a Leisure Hub (19/04358/STPLF/ 23/03025/STREM)	Leisure Facility	Approved	1	Construction: Unknown	0.5	21.3	23.8	No	
High Farm Holiday Park (22/03269/STPLF)	Leisure Facility	Approved	1	Construction: Unknown	0.4	7.4	10.0	No	
Hornsea Project Four Offshore Wind Farm (EN010098)	Offshore Wind Farm	Under Construction	1	Construction: 2024 to 2028 Operation: 2029+	0	0.11	0.01	No	Hornsea Project Four will be operational during the construction phase of the Project. Therefore, no cumulative impacts on any shared receptors are predicted.
Skipsea Sands Holiday Park (22/01741/PLF)	Leisure Facility	Approved	1	Construction: Unknown	0.2	23.6	26.0	No	There is a potential for a temporal overlap with construction of these projects which could cause cumulative effects for ecological receptors. However, any ecological effects arising from the construction of a development of this scale are likely to be relatively minor and addressed at the project level. Furthermore, there is no spatial overlap between these projects and the Project. Therefore, there is no potential for significant cumulative effects.
Wanlass Beck National Grid Substation (24/03819/STPLF)	Electricity Transmission Infrastructure	Pending Consideration	1	Construction: 2026 to 2030 Operation: 2031+	0.9	2.1	3.0	No	
Peartree Hill Solar Farm (EN010157)	Solar Farm	Planning	2	Construction: 2026 to 2027 Operation: 2028+	0.42	1.05	2.66	No	The solar farm project will be operational prior to commencement of the Project's construction and would not have the potential to cause a cumulative operational effect.

Project / Plan	Development Type	Status	Tier	Construction / Operation Period	Closest Distance to Onshore ECC (km)	Closest Distance to OCS Zone 4 (km)	Closest Distance to OCS Zone 8 (km)	Potential for Significant Cumulative Effects	Rationale
Birkhill Wood National Grid Substation	Electricity Transmission Infrastructure	Planning	3	Construction: 2026 to 2030 Operation: 2031+	0.0	1.11	2.31	Yes	Due to the proximity of Birkhill Wood Substation to the Project, there is the potential for cumulative effects of a direct / indirect nature on the receptors identified. However, no planning application has been submitted at the time of writing, and therefore, there are limited details of the project. An assessment of potential cumulative effects will be re-examined in the CEA prepared at ES stage based on publicly available information at the time.
North Humber to High Marnham Grid Upgrade (EN020034)	Electricity Transmission Infrastructure	Planning	3	Construction: 2028 to 2030 Operation: 2031+	0	0.89	0.41	Yes	Due to the spatial overlap of the grid upgrade project and the Project, there is the potential for cumulative effects of a direct / indirect nature on the receptors identified. However, at the time of writing, only an Environmental Impact Assessment Scoping Report has been published on the proposed development (National Grid, 2023). No detailed ecological survey results or assessments are included within this report. Therefore, there is currently insufficient ecological information to complete an assessment of potential cumulative effects. This will be re-examined in the CEA prepared at ES stage based on publicly available information at the time.

23.8.3 Assessment of Cumulative Effects

499. As described in **Table 23-32** there is the potential for cumulative effects on ecology and ornithology receptors as a result of the following projects and the Project as there is a spatial overlap with the Onshore Development Area:

- Birkhill Wood National Grid Substation;
- Dogger Bank South Offshore Wind Farms; and
- North Humber to High Marnham Grid Upgrade.

500. As discussed in **Table 23-32**, due to the lack of information on the Birkhill Wood National Grid Substation and North Humber to High Marnham Grid Upgrade project, an assessment of potential cumulative effects will be undertaken at ES stage. Therefore, the assessment presented below only covers cumulative effects with the Dogger Bank South Offshore Wind Farms project.

501. It should be noted that the Dogger Bank South Offshore Wind Farms project only overlaps with the onshore ECC of the Project and not the landfall or either OCS zone. It is predicted that potential cumulative effects may occur during the construction and O&M phases of the Dogger Bank South Offshore Wind Farms project and the Project.

502. Similar to the approach noted in **Section 23.4.5**, the CEA for the OCS zone infrastructure will remain the same for both development scenarios. Only one OCS zone option will be taken forward to development, which will be confirmed in the ES. Therefore, there is no cumulative development scenario in which both OCS zones would be developed to be considered in the CEA.

503. The following sections discuss which ecology and ornithology receptors may be impacted cumulatively as a result of the Dogger Bank South Offshore Wind Farms project and the Project.

23.8.3.1 Cumulative Impact 1: Direct and Indirect Impacts to Designated Ecological Sites: International (ECO-C-01)

504. The Dogger Bank South Offshore Wind Farms has the potential for cumulative effects during construction on internationally designated sites. This is due to the spatial overlap of the internationally designated site's ZoI between the Dogger Bank South Offshore Wind Farms project and the Project. There are two internationally designated sites within 10km of the Onshore Development Area: the Greater Wash SPA and the Humber Estuary SPA, SAC and Ramsar site.

23.8.3.1.1 Receptor Importance

505. The Greater Wash SPA is of **high** importance as a statutory designated site. This is due to the qualifying features including internationally important numbers of various species of breeding and wintering waterbirds.

506. The Humber Estuary SAC, SPA and Ramsar site is of **high** importance as a statutory designated site. This is due to the qualifying features of each designation including Annex I habitats, Annex II species and internationally important numbers of various species of breeding and wintering waterbirds.

23.8.3.1.2 Cumulative Impact Magnitude

507. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is a commitment to avoid statutory designated sites wherever possible as part of the site selection and route planning.

508. Detailed air quality assessments suggested that the mudflats and sandflats not covered by seawater at low tide within the Humber Estuary SAC could be affected by the increase in NO_X and NH_3 from road traffic associated with the construction phase of the Dogger Bank South Offshore Wind Farms project.

509. The magnitude of the construction cumulative impacts on internationally designated sites is considered to be **negligible**, as the construction activities are unlikely to adversely affect the qualifying features of the designated ecological sites.

23.8.3.1.3 Cumulative Effect Significance

510. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.2 Cumulative Impact 2: Direct and Indirect Impacts to Designated Ecological Sites: National, Local and Non-Statutory (ECO-C-01)

511. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on national, local and non-statutory designated sites. This is due to the spatial overlap of the designated sites' ZoI between the Dogger Bank South Offshore Wind Farms project and the Project. Construction activities, such as trenching, excavation, piling and movement of plant and equipment may have direct and indirect cumulative impacts upon the qualifying features and condition of designated sites.

23.8.3.2.1 Receptor Importance

512. As mentioned in **Section 23.7.1.2.1**, there are several nationally important nationally designated sites within 2km of the Onshore Development Area.

513. Leven Canal SSSI is of **high** importance as a statutory designated site and diverse wetland which is a remnant of a habitat type that is no longer widespread and does not tolerate change in its quality.

514. Bryan Mills Field SSSI is of **high** importance as a statutory designated site. It is of small size (1.3 ha) making it sensitive to ecological changes and less able to recover from disturbance.

515. Burton Bushes SSSI is of **high** importance, as the undisturbed soil is an important qualifying feature of the site, and rich herb flora are present in remnant populations. The soil and flora would be sensitive to disturbance from construction activities.

516. Tophill Low SSSI is of **high** importance as a statutory designated site. The habitat consists of two artificial storage reservoirs which are less sensitive to disturbance, but these reservoirs support nationally important numbers of wildfowl, which are more sensitive to disturbance and are significant for the UK's wildfowl population health.

517. Pulfin Bog SSSI is of **high** importance as a statutory designated site and fenland reed swamp community, supporting sensitive botanical communities and breeding birds. Fenland is highly sensitive to disturbance and ecological change.

518. Beverley Parks LNR **medium** importance as a non-statutory designated site. The habitats present (broadleaved woodland, orchard and grasslands) are not as sensitive as those listed for the above SSSI, and can cope with and recover from a larger extent of disturbance.

519. 28 non-statutory designated sites are located within, adjacent, or hydrologically connected to Onshore Development Area and considered of **medium** importance. **Table 23-16** outlines further details of non-statutory designated sites.

23.8.3.2.2 Cumulative Impact Magnitude

520. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is a commitment to avoid statutory designated sites wherever possible as part of the site selection and route planning. Woodland LWS will be avoided completely and any other LWS habitat will be reinstated. A small section of the Nunkeeling Lane LWS will be affected by the Dogger Bank South Offshore Wind Farms Project, although this LWS is not located within 2km of the Onshore Development Area of the Project, thus, no cumulative impacts are anticipated.

521. The magnitude of the construction cumulative impacts on nationally designated sites is considered to be **negligible**, as the construction activities are unlikely to adversely affect the designated features of the designated ecological sites.

23.8.3.2.3 Cumulative Effect Significance

522. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.3 Cumulative Impact 3: Direct Impacts to Habitats (ECO-C-02): Woodlands

523. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on woodland habitat due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project.

524. There may be a cumulative potential to have permanent habitat loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.

23.8.3.3.1 Receptor Importance

525. Traditional orchards, lowland mixed deciduous woodland, lowland beech and yew woodland, and wet woodland are all considered to be priority habitats and are therefore of **high** importance. It can take upwards of 10 years for planted trees to become a woodland, mitigating the loss of existing deciduous woodland habitat.

526. Ancient woodlands and veteran trees are also considered to be of **high** importance, due to them being irreplaceable habitats, which take centuries to develop and therefore cannot be easily recreated.

527. All non-priority woodland habitat types are considered to be of **medium** importance, due to their inherent ecological value but lack of designation or importance above county level.

23.8.3.3.2 Cumulative Impact Magnitude

528. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there are various mitigation commitments regarding the protection of woodland habitat, for example, incorporation of root protection areas, establishing veteran tree buffers, tree barriers and compensatory tree planting.

529. Within the Dogger Bank South Environmental Statement (Chapter 19 – Terrestrial Ecology and Ornithology) (RWE, 2025), it is determined that woodland areas will not be impacted by construction activities because trenchless techniques (such as HDD) will be used to avoid direct impacts to woodland. This includes all areas of ancient woodland and woodland priority habitat.

530. Consideration to potential changes in air quality originating from an increase of emissions from construction vehicles impacting woodland habitat was considered. The results of the air quality assessment determined the increase in construction vehicle emissions was below the concentration considered to be a significant increase.

531. The potential for cumulative adverse impacts to woodlands with the combined mitigation commitments is therefore considered to be limited.

532. The magnitude of the cumulative impacts on all habitats is therefore considered to be **negligible**, as the construction activities are localised, temporary and unlikely to adversely affect notable or sensitive woodland habitats.

23.8.3.3.3 Cumulative Effect Significance

533. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.4 Cumulative Impact 4: Direct Impacts to Habitats (ECO-C-02): Arable Field Margins

534. The Dogger Bank South Offshore Wind Farms project the potential for cumulative effects during construction on arable field margin habitat due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project.

535. There may be a cumulative potential to have permanent habitat loss across of arable field margins the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.

23.8.3.4.1 Receptor Importance

536. Arable field margins are a priority habitat and are therefore of **high** importance. The sensitivity of the habitat is considered to be low for smaller less floristically diverse margins with reduced habitat connectivity, and medium for arable field margins which are better established, diverse and ecologically connected to the wider landscape.

23.8.3.4.2 Cumulative Impact Magnitude

537. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment for arable field margins to be managed prior to commencement of construction to deter birds which may seek to use this habitat for nesting purposes.

538. The changes to terrestrial habitats are only permanent for the Project's OCS, ESBI, and link boxes within the landfall and onshore ECC, however, they are negligible in scale with minimal impact in the viability of this habitat within the region. As such, the magnitude of impact would be **negligible**.

23.8.3.4.3 Cumulative Effect Significance

539. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.5 Cumulative Impact 5: Direct Impacts to Habitats (ECO-C-02): Maritime Cliff and Slopes

540. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on maritime cliffs and slope habitat due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project.

541. There may be a cumulative potential to have permanent habitat loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.

23.8.3.5.1 Receptor Importance

542. Soft rock sea cliffs are a subset of maritime cliff and slope habitat and are therefore of **high** importance.

23.8.3.5.2 Cumulative Impact Magnitude

543. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment to using trenchless activities such as HDD at landfall, avoiding direct impacts to maritime cliff and slope habitats. Furthermore, emergency beach access for the Dogger Bank South project may be required during construction and would be located to the north of Ulrome within an area of maritime cliff and slope habitat. The Dogger Bank South project has committed to retaining all maritime cliff and slope habitat, but it may be temporarily disturbed if emergency works are required during construction.

544. Despite this, the cumulative magnitude of impact on maritime cliff and slope habitats is deemed to be **negligible**, as direct impacts are minimised through the use of trenchless techniques and embedded mitigation reduces the likelihood of any temporary indirect impacts having a meaningful impact on habitat condition.

23.8.3.5.3 Cumulative Effect Significance

545. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.6 Cumulative Impact 6: Direct Impacts to Habitats (ECO-C-02): Riparian and Freshwater Habitats

546. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on riparian and freshwater habitats due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project.

547. There may be a cumulative potential to have permanent habitat loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.

23.8.3.6.1 Receptor Importance

548. Running waterbodies, namely other rivers and streams and canals, are deemed to be of **moderate** importance. This is as a result of their ability to support protected and notable species, as well as providing hydrological connectivity to the wider riparian habitat network at a district level.

549. Standing waterbodies, namely ponds and ditches, are deemed to be of **low** importance. This is as a result of their ability to support protected and notable species; however, they were not in a good enough condition to be deemed priority habitats.

550. As priority habitats, lowland fen, coastal and floodplain grazing marsh, and reedbeds are of **high** importance.

23.8.3.6.2 Cumulative Impact Magnitude

551. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment to using trenchless construction methods (including HDD) to avoid direct interaction with main river watercourses. Entry and exit points for trenchless construction methods will be at least 20m away from Environment Agency surface water points.

552. For ordinary watercourse, the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), has committed to trenchless crossing techniques with entry and exit points at least 9m from Internal Drainage Board (IDB) drains and ordinary watercourses.

553. With embedded mitigation measures, the magnitude of the cumulative impact upon riparian and freshwater habitats is considered to be **negligible**, as any impacts that occur will be small-scale, temporary, reversible, and only occur during construction.

23.8.3.6.3 Cumulative Effect Significance

554. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.7 Cumulative Impact 7: Direct Impacts to Habitats (ECO-C-02): Hedgerows

555. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on hedgerows due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project.

556. There may be a cumulative potential to have permanent habitat loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.

23.8.3.7.1 Receptor Importance

557. Within the context of the Dogger Bank South Offshore Wind Farms project, hedgerows are considered to be of **medium** importance (RWE, 2024). In respect of the Project alone, they have been assessed as being of up to **high** importance.

23.8.3.7.2 Cumulative Impact Magnitude

558. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment to establishing 5m (in width) buffer zones around suitable hedgerows to be retained. The reinstatement of any hedgerow lost is likely to also provide opportunities to increase species richness and fill in existing gaps in the previous hedgerow.

559. The Dogger Bank South Offshore Wind Farms Environmental Statement, Volume 7, Chapter 18 – Terrestrial Ecology and Ornithology (RWE, 2025) states that the magnitude of impact is **low adverse**.

560. For the Project alone, the magnitude is anticipated to be **negligible adverse**.

23.8.3.7.3 Cumulative Effect Significance

561. Overall, it is predicted hedgerows are of **medium** and **high** importance for Dogger Bank South Offshore Wind Farms project (RWE, 2024) and the Project alone, respectively. The magnitude of the impact is **low adverse** for Dogger Bank South and **negligible adverse** for the Project alone. With the implementation of embedded mitigation measures, both the Dogger Bank South Offshore Wind Farms project and the Project are considered to result in **minor adverse** effects.

562. In combination, no additive or synergistic cumulative effects are anticipated. The significance of cumulative effects is therefore anticipated to be **minor adverse**, which is **not significant** in EIA terms.

23.8.3.8 Cumulative Impact 8: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Great Crested Newts

563. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on GCN due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

564. During construction, there is potential for construction activities to result in the permanent loss of GCN habitats. Construction activities, such as trenching, excavation, piling and movement of plant and equipment, may result in GCN disturbance and displacement.

565. A total of 42 ponds were identified within the Onshore Development Area with two considered to be of 'excellent' suitability for GCN, seven of 'good' suitability, three of 'average' suitability, 17 of 'below average' suitability, and 13 considered to be of 'poor' suitability, as per the HSI results outlined in **Section 23.6.1.3.5**.

23.8.3.8.1 Receptor Importance

566. GCN are a priority species, so the importance of the receptor is considered to be **high**.

23.8.3.8.2 Cumulative Impact Magnitude

567. Although it is anticipated that the Dogger Bank South Offshore Wind Farms project will adopt mitigation measures similar to the Project, there is the potential for additive or incremental cumulative effects due to the spatial overlap anticipated.

568. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment for onsite mitigation with individual EPS Licences or DLL for the species. Fencing of the ponds where GCN have been found within the Landfall Zone will be considered in order to prevent animals from entering work areas.

569. With the adoption of the embedded and additional mitigation measures for GCN, the magnitude of the Project's impacts is anticipated to be **negligible,** when taken alone and in combination with other projects.

23.8.3.8.3 Cumulative Effect Significance

570. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is **negligible** and is **not significant** in EIA terms.

23.8.3.9 Cumulative Impact 9: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Badgers

571. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on badgers due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

572. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified two active badger setts within the Onshore Development Area, which could be destroyed or disturbed by construction activities. Damage and disturbance could also occur during construction to foraging and commuting habitats which support the badger population in the setts.

23.8.3.9.1 Receptor Importance

573. As a species, badgers are protected by law, and it is unlawful to kill or disturb them or habitat features they are currently using. However, they are not a priority species. Badgers are considered to be a fairly resilient species with the ability to tolerate the potential impacts of this development. They have potential to be able to recover to an acceptable degree over a 10-year period post-construction.

574. The importance of the receptor is therefore considered to be **medium**.

23.8.3.9.2 Cumulative Impact Magnitude

575. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment for works-free buffer zones to be demarcated on site around areas of badger activity to ensure these are kept fully intact and with minimal interference from construction. Further mitigation includes covering of topsoils and implementation of sensitive construction light plan.

576. The Project's embedded mitigation measure (Commitment ID CO87) will ensure badger access is maintained in relevant constructions areas when work is not taking place in order to ensure normal movements as far as reasonably practicable in line with the Outline EcoMP. Furthermore, provision will be made to avoid any entrapment of any animal, and checks will be made as required by the ECoW.

577. Subject to the implementation of the embedded and additional mitigation measures which will be secured as part of the Project, the residual effect of the Project alone will be **low adverse.**

578. Given the limited spatial overlap between the Dogger Bank South Offshore Wind Farms project with the Onshore Development Area, the risk of any low adverse effects being on the same individual badgers is low. Therefore, the magnitude of residual impacts from the Dogger Bank South Offshore Wind Farms project are not considered sufficient to result in a cumulative increase in impact from the **low adverse** level.

23.8.3.9.3 Cumulative Effect Significance

579. Overall, it is predicted that the importance of the receptor is **medium**, and the magnitude of the impact is **low**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.10 Cumulative Impact 10: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Roosting Bats

580. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on roosting bats due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

581. During construction, there is potential for bat roosts within the Onshore Development Area to be disturbed. Based on the results of the desk study and PEA report, the bat species present are likely to be common pipistrelle, soprano pipistrelle and myotis.

23.8.3.10.1 Receptor Importance

582. Bats are a priority species and cannot legally be disturbed, with the same applying to structures and habitats that are used for roosting.

583. The importance of the receptor is therefore considered to be **high**.

23.8.3.10.2 Cumulative Impact Magnitude

584. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h), there is a commitment, when possible, to retain all known roost sites or replace roosts identified during pre-construction surveys.

585. The Project's embedded mitigation measure (Commitment ID CO86) will ensure that all trees affected by the construction works will be re-assessed for their suitability for roosting bats prior to the commencement of works and to determine the requirement for additional surveys in line with the Outline EcoMP.

586. With the implementation of the embedded and additional mitigation measures, the magnitude of impacts from the Project is anticipated to be **low**.

587. Given the limited spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project, the risk of any residual impacts acting in combination to result in a cumulative increase in magnitude is low. Therefore, based on the information available at the time of writing, the magnitude of cumulative impacts is not anticipated to increase above the **low adverse** predicted for the Project alone.

23.8.3.10.3 Cumulative Effect Significance

588. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the cumulative impact is **low**. The cumulative effect is therefore of **moderate adverse** significance which is **significant** in EIA terms. However, it is expected that once the status of bats within and around the Onshore Development Area is known, more specific mitigation can be implemented through the ES which would aim to further reduce any residual effects of the Project and consequently, cumulative effects to a **minor adverse** level.

23.8.3.11 Cumulative Impact 11: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Foraging and Commuting Bats

589. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on foraging and commuting bats due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project. Receptor Importance

590. Bats are a priority species and cannot legally be disturbed.

591. The importance of the receptor is therefore considered to be **high**.

23.8.3.11.1 Cumulative Impact Magnitude

592. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is a construction commitment, where important hedgerow commuting corridors must be removed, to create artificial and moveable corridors to be installed nightly to retain migratory channels for foraging and commuting bats.

593. The worst-case scenario would be that foraging and commuting habitats will be lost in areas of high activity and particularly for more sensitive and / or rarer bat species, and for commuting and foraging bats to be killed or injured in the process. This would be a direct and irreversible impact to the bats.

594. Foraging and commuting bats are particularly vulnerable if flight lines or significant and sensitive habitats are lost, this can lead to significant effects to populations.

595. A more detailed account of proposed mitigation measures will be provided in the Outline EcoMP and provisional mitigation measures are summarised in **Section 23.7.1.11**. With the adoption of additional mitigation measures, the magnitude of impact would be **low**.

23.8.3.11.2 Cumulative Effect Significance

596. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact with the adoption of additional mitigation measures is **low**. The cumulative effect is therefore of **moderate adverse** significance, which is **significant** in EIA terms. It is expected that once the status of bats within and around the Onshore Development Area is known, more specific mitigation can be implemented through the ES which would ensure that residual effects of the Project alone and in combination are **minor adverse**.

23.8.3.12 Cumulative Impact 12: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Overwintering and Passage Birds

597. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on overwintering and passage birds due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project. Receptor Importance

598. Overwintering and passage birds in and adjacent to the Onshore Development Area have **medium** importance and **medium** sensitivity to the construction impacts, i.e. the overwintering and passage species identified have capacity to tolerate the potential impacts and could potentially recover to similar status over a ten-year period.

23.8.3.12.1 Cumulative Impact Magnitude

599. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is commitment to control lighting, noise and vibration throughout construction works, and reactive additional mitigation dependent on overwintering birds being present in pre-construction surveys. There is no mitigation commitment regarding passage birds.

600. The worst-case scenario is direct injury or death of overwintering and passage birds or disturbance and displacement of overwintering and passage birds from resting or foraging habitat, i.e. temporary or permanent habitat loss. However, following the embedded mitigation measures across projects, construction would not alter the ability of most species and most individuals which occur in the baseline environment to undertake normal overwintering and passage behaviours including resting, foraging and migration. Instances of direct mortality would be exceptionally rare.

601. Additional mitigation by both the Dogger Bank South project and the Project will be determined on the basis of pre-construction surveys, and ECoW oversight of construction works once initiated.

602. With the adoption of additional mitigation measures, the magnitude of impact would be **low.**

23.8.3.12.2 Cumulative Effect Significance

603. Overall, it is predicted that the importance of the receptor is **medium** and the magnitude of the cumulative impact is **low**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.13 Cumulative Impact 13: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Breeding Birds

604. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on breeding birds due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

23.8.3.13.1 Receptor Importance

605. Breeding birds could include Schedule 1 species and so have **high** sensitivity to the construction impacts, i.e. the breeding species identified are unable to tolerate the potential impacts, with consequence of reduction in abundance or breeding condition.

23.8.3.13.2 Cumulative Impact Magnitude

606. The Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) commits to the control of vegetation removal, nesting bird checks prior to and during construction, replanting of felled hedgerows, scrub or woodland, control of lighting, noise and vibration throughout construction works, and reactive additional mitigation should nesting birds be present.

607. With the adoption of additional mitigation measures from both the Dogger Bank South Offshore Wind Farms Project and the Project, the magnitude of impact is anticipated to be **low**.

23.8.3.13.3 Cumulative Effects Significance

608. Overall, it is predicted that the importance of the receptor is **medium** and the magnitude of the cumulative impact is **low**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.14 Cumulative Impact 14: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Protected Fish Species

609. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on protected fish species due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

610. During construction, there is potential for fish species within the Onshore Development Area to be disturbed, injured or killed. Based on the results of the desk study and PEA report, the fish species present are likely to be European eel, bullhead, lamprey species and brown / sea trout.

23.8.3.14.1 Receptor Importance

611. Protected fish species such as the European eel, lamprey and brown / sea trout are priority species.

612. The importance of the receptor is therefore considered to be **high**.

23.8.3.14.2 Cumulative Impact Magnitude

613. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is commitment to use trenchless crossing methodologies such as HDD at watercourse crossings and locate entry and exit points at least 9m away from IDB drains and ordinary surface water bodies. There is also a commitment to conduct fish rescues where temporary dams are required prior to dewatering the area and the installation of 2mm diameter nets to pumps where fish could be present.

614. The worst-case scenario would be that fish species' integrity and conservation status are unlikely to be adversely affected.

615. Fish species are particularly vulnerable to injury or death from pollution events or through accidental sedimentation events. However, with the implementation of the embedded and additional mitigation measures of the projects, the residual magnitude of impact is anticipated to be **negligible**.

23.8.3.14.3 Cumulative Effect Significance

616. Overall, it is predicted that the importance of the receptor is **high**, and the residual magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.15 Cumulative Impact 15: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Invertebrates

617. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on invertebrates due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

618. There is potential for protected invertebrates and their habitat to be disturbed or lost during construction. The PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified invertebrates such as cinnabar moth caterpillar, butterflies, dragonflies, damselflies and ladybirds with pupae. The PEA surveys also identified suitable invertebrate habitat, including dead wood with small holes, and hedgerows.

619. During construction, there is potential for construction activities to result in the permanent loss of invertebrate habitats. Construction activities, such as trenching, excavation, piling and movement of plant and equipment, may result in invertebrate disturbance and displacement.

23.8.3.15.1 Receptor Sensitivity

620. The sensitivity of the receptor is considered to be **medium**.

23.8.3.15.2 Cumulative Impact Magnitude

621. Invertebrates were scoped out of the Dogger Bank South Offshore Wind Farms Environmental Impact Assessment (RWE, 2025) following the desktop study results and low distinctives of that habitats for invertebrates that will be affected by the development.

622. The magnitude of the impact from the Project is **low**.

23.8.3.15.3 Cumulative Effect Significance

623. Overall, it is predicted that the sensitivity of the receptor is **medium**, and the magnitude of the impact is **low**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.16 Cumulative Impact 16: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Otters

624. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on otters due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

625. During construction, there is potential for otter and their associated habitats to be disturbed or lost, as the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified suitable otter habitat within the Onshore Development Area, including a network of ditches, large watercourses and large ponds.

23.8.3.16.1 Receptor Importance

626. Otters are EPS and priority species, and therefore of **high** importance.

23.8.3.16.2 Cumulative Impact Magnitude

627. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is commitment to undertake a suite of pre-construction checks for otter between four to twelve months prior to the start of construction to determine the requirement for any Natural England licenses. Emergency procedures will be implemented by site workers if otters are unexpectedly encountered. If night working is required, construction lighting will be focused on working areas and directed away from water courses.

628. Embedded and additional mitigation measures will be implemented for both projects to ensure the magnitude of impact is no greater than **negligible.**

23.8.3.16.3 Cumulative Effect Significance

629. Overall, it is predicted that the importance of the receptor is **high**, and the residual magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.17 Cumulative Impact 17: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Reptiles

630. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on reptiles due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

631. During the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) suitable hibernacula and habitats for reptiles were identified, although no reptiles were seen. The habitats included hedgerows and woodland which could provide suitable shelter and foraging for reptile species.

23.8.3.17.1 Receptor Importance

632. Reptile species have some resilience to potential impacts and may recover to an acceptable status over a 10-year period.

633. The importance of the receptor is therefore considered to be **medium**.

23.8.3.17.2 Cumulative Impact Magnitude

634. With the implementation of embedded and additional mitigation measures, the impacts of both projects are expected to be of a **low adverse** magnitude.

23.8.3.17.3 Cumulative Effect Significance

635. Overall, it is predicted that the importance of the receptor is **medium**. With the adoption of additional mitigation measures from the projects, the magnitude of impact is anticipated to be **low**.

636. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.18 Cumulative Impact 18: Direct and Indirect Impacts on Legally Protected Species (ECO-C-03): Water Voles

637. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during construction on water voles due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project.

638. During construction there is potential for water vole and its associated habitats to be disturbed or lost, as the PEA surveys (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**) identified suitable water vole habitat within the Onshore Development Area, including a network of ditches.

23.8.3.18.1 Receptor Importance

639. As a legally protected species, water vole are of **high** importance.

23.8.3.18.2 Cumulative Impact Magnitude

640. Within the Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) there is commitment to conducting a suite of pre-construction checks for water voles between four to twelve months prior to the start of any construction works. Subject to the findings of these pre-construction surveys, an application to Natural England for the required licence would be submitted. Other general mitigation measures will be implemented if water vole evidence is found during pre-construction surveys including strimming of vegetation and exclusion fencing to discourage water vole from the working areas. If required, trapping and translocation of water vole will be conducted under the appropriate Natural England license.

641. With the implementation of embedded and additional mitigation measures, the magnitude of impact from the projects is anticipated to be **low adverse**.

23.8.3.18.3 Cumulative Effect Significance

642. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **low**.

643. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.19 Cumulative Impact 19: Spread of Invasive Non-Native Species (ECO-C-04)

644. During construction, there is potential for the spread of INNS within the Onshore Development Area.

645. Seven INNS, including yellow archangel, cotoneaster and *Montbretia Crocosmia x crocosmiiflora* were identified during the PEA surveys within the Onshore Development Area (**Volume 2, Appendix 23.2 Preliminary Ecological Appraisal Report**).

646. During the construction phase of the Project, INNS can be spread through displacement / movement / disposal of organic matter and contamination of equipment / machines / vehicle tyres or tracks / contractor clothing.

647. The spread of any potential INNS will be controlled through measures in the Outline EcoMP which will be developed at ES stage (Commitment ID CO81). This will include measures such as the cleaning of machinery, equipment and clothing after use to prevent INNS being transferred across and beyond the Onshore Development Area, and the early identification of INNS present at the time of construction by ECoW.

23.8.3.19.1 Receptor Importance

648. A number of the INNS recorded within the Onshore Development Area are legally controlled under Schedule 9 of the WCA (1981).

649. If INNS were to be spread during construction activities, there is potential for breach of the WCA (1981) and degradation of native habitats or species. This could result in a long-term adverse impact within the local area. As a result, the importance of this receptor is **medium**.

23.8.3.19.2 Cumulative Impact Magnitude

650. The Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) commits to producing an INNS Management Plan if INNS are found within the Dogger Bank South Project's working areas (no records of INNS were recorded).

651. The Dogger Bank South Offshore Wind Farms Outline EcoMP v3 (RWE, 2024h) also commits to monitoring construction activities to identify potential INNS and apply suitable mitigation measures if required (e.g. 7m exclusion zones, appropriate signage, ECoW supervision and topsoil management). Appropriate biosecurity measures will be upheld in areas identified to support INNS and regular inspections by an ECoW will monitor the distribution.

652. Considering the embedded mitigation measures, the INNS which have been identified within the Onshore Development Area for the Project and the Dogger Bank South Offshore Wind Farms project are unlikely to be spread and relevant legislation is likely to be fully adhered to. Therefore, the magnitude of this impact would be **negligible**.

23.8.3.19.3 Cumulative Effect Significance

653. Overall, it is predicted that the importance of the receptor is **medium**, and the magnitude of the impact is **negligible.** The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.20 Cumulative Impact 20: Direct and Indirect Impacts to Designated Ecological Sites (ECO-O-01)

654. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during operation on designated sites due to the spatial overlap of the designated sites ZoI between the Dogger Bank South Offshore Wind Farms project and the Project.

655. The OCS and ESBI will be unmanned assets with no permanent on-site personnel presence. However, routine inspections and maintenance requiring temporary personnel presence will occur throughout the O&M phase within the OCS zone. It is considered that these activities will have no direct effect on ecological receptors Any effects on onshore ecology receptors will be limited to temporary indirect disturbance to the adjacent habitats and species, including those potentially associated with ecological designated sites.

656. Maintenance of the onshore export cable and landfall infrastructure is expected to be minimal. Routine non-intrusive inspection works are anticipated to consist of a visit to link box locations every six months for cable joint inspection and monitoring. Periodic testing of onshore export cables is likely to be required every six months, which would be undertaken at defined inspection points along the onshore ECC.

657. Unplanned emergency maintenance works to address faults will be undertaken as required, and depending on the nature of the repair, may involve intrusive works such as the excavation of the TJB / jointing bays, removal of faulty equipment and installation of replacement spare parts. Any reactive repairs to buried cables, in the unlikely event of a cable failure, will have fewer potential impacts to those of construction (**Section 23.7.1**), as they would be localised, of small scale and temporary in nature. Additionally, micro-siting during detailed design will likely ensure all designated sites are avoided when deciding the placement of link boxes (see **Chapter 5 Site Selection and Consideration of Alternatives**).

658. No losses of habitats which may be associated with ecological designated sites are anticipated to occur during O&M activities.

659. During the operation of OCS Zone 8, there is a low risk that operational noise and lighting may result in disturbance and / or illumination of adjacent designated sites, namely Fishpond Wood, Risby Estate LWS and Risby Park LWS. No designated ecological sites are directly adjacent to OCS Zone 4 and therefore indirect impacts are unlikely to occur from operational noise or lighting on nearby ecological designated sites.

660. Operational lighting (with the exception of low-level, motion-sensor security lighting) at the OCS zone will only operate when required for O&M activities during low light conditions Operational lighting will be designed in accordance with the latest relevant available guidance and legislation and to minimise light spill into the surrounding landscape and effects on ecological receptors. Details of the height location, design and luminance of operational lighting will be provided as part of detailed design (Commitment ID CO66).

661. An operational noise investigation protocol will be developed and implemented for the OCS and ESBI, which will require an assessment of operational noise and a monitoring programme to measure noise levels during operation to ensure specified limits are not exceeded at identified noise sensitive receptors (Commitment ID CO71).

23.8.3.20.1 Receptor Importance

662. All statutory designated sites are considered to be of **high** importance.

663. All non-statutory designated sites are considered to be of **medium** importance.

23.8.3.20.2 Cumulative Impact Magnitude

664. Although it is anticipated that the Dogger Bank South Offshore Wind Farms project will adopt mitigation measures similar to the Project, there is the potential for a greater cumulative pressure upon designated sites during the O&M phase.

665. The magnitude of operational cumulative impacts on designated sites is considered to be **negligible**, as the O&M activities are unlikely to adversely affect the designated features of the designated ecological sites.

23.8.3.20.3 Cumulative Effect Significance

666. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the cumulative effect is of **minor adverse** significance, which is **not significant** in EIA terms.

23.8.3.21 Cumulative Impact 21: Direct Impacts to Habitats (ECO-O-02)

667. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during operation on habitats due to the spatial overlap of the habitats of the Dogger Bank South Offshore Wind Farms project and the Project. The nature of operational cumulative impact on habitats are similar to the cumulative impact on designated ecological sites as described in **Section 23.8.3.20**.

23.8.3.21.1 Receptor Importance

668. The importance of all priority habitats and ancient woodland within the Onshore Development Area is considered to be **high**.

669. All non-priority woodland habitats are considered to be of **medium** importance, due to their inherent ecological value but lack of designation or importance above county level.

670. Running and standing waterbodies are considered to be of **low** importance, as their value is limited to a maximum of district level.

671. All other habitats within the Onshore Development Area are considered to be of a **negligible** level of importance, due to their importance being restricted to a local level.

23.8.3.21.2 Cumulative Impact Magnitude

672. The magnitude of the operational impacts on all habitats is considered to be **negligible**, as the O&M activities are localised, temporary and unlikely to adversely affect notable or sensitive habitats.

23.8.3.21.3 Cumulative Effect Significance

673. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance. which is **not significant** in EIA terms.

23.8.3.22 Cumulative Impact 22: Direct and Indirect Impacts on Legally Protected Species (ECO-O-03)

674. The Dogger Bank South Offshore Wind Farms project has the potential for cumulative effects during operation on legally protected species due to the spatial overlap between the Dogger Bank South Offshore Wind Farms project and the Project. The potential for cumulative impact on legally protected species arise from the Project's O&M activities as described in **Section 23.8.3.20**.

23.8.3.22.1 Receptor Importance

675. All legally protected species are considered to be of **high** importance due to their ecological value on a national and international scale.

23.8.3.22.2 Cumulative Impact Magnitude

676. The magnitude of the operational impacts on all legally protected species is considered to be **negligible**, as the O&M activities are localised, temporary and unlikely to adversely affect notable or sensitive species.

23.8.3.22.3 Cumulative Effect Significance

677. Overall, it is predicted that the importance of the receptor is **high**, and the magnitude of the impact is **negligible**. The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **minor adverse** significance which is **not significant** in EIA terms.

23.8.3.23 Cumulative Impact 23: Spread of Invasive Non-Native Species (ECO-O-04)

678. There is a low likelihood INNS could be spread during O&M activities through inadvertent introduction from elsewhere via vehicles, plant or personnel, and via seeds, planting stock or substrate. However, the spread of any potential INNS will be controlled through measures detailed within the Outline EcoMP (Commitment ID CO81). Therefore, the likelihood of INNS spread occurring is minimal.

23.8.3.23.1 Receptor Importance

679. If INNS were to be spread during O&M activities, there is potential for harm to be caused to native habitats and species through habitat degradation, out-competition of habitat and predation. As a result, the importance of this receptor is **medium**.

23.8.3.23.2 Cumulative Impact Magnitude

680. The magnitude of impact is **negligible**, as appropriate biosecurity measures with regard to INNS will be detailed within the EcoMP for O&M activities within the Onshore Development Area. Therefore, the risk for potential cumulative adverse effects on ecological receptors is minimal.

23.8.3.23.3 Cumulative Effect Significance

681. Overall, it is predicted that the importance of the receptor is **medium**, and the magnitude of the impact is **negligible.** The effect of these impacts is not anticipated to be additive or synergistic. Therefore, the residual cumulative effect is of **negligible** significance. which is **not significant** in EIA teams.

23.9 Inter-Relationships and Effects Interactions

23.9.1 Inter-Relationships

682. Inter-relationships are defined as effects arising from residual effects associated with different environmental topics acting together upon a single receptor or receptor group. Potential inter-relationships between onshore ecology and ornithology and other environmental topics have been considered, where relevant, within the PEIR. **Table 23-33** provides a summary of key inter-relationships and signposts to where they have been addressed in the relevant chapters.

Table 23-33 Onshore Ecology and Ornithology – Inter-Relationships with Other Topics

Impact ID	Impact and Project Activity	Related EIA Topic	Where Assessed in this PEIR Chapter	Rationale
Construction				
ECO-C-01	Direct and indirect impacts to designated ecological sites – construction activities, such as trenching, excavation, piling and movement of plant and equipment	**Chapter 21 Water Resources and Flood Risk**	**Section 23.7.1.1**	Potential changes to the hydrology, geomorphology and water quality could impact upon water-dependent biological communities and designated sites located in each catchment.
		Chapter 25 Noise and Vibration		Construction activities will result in new sources of noise and ground vibration. These have the potential to impact nearby designated ecological sites. It has been assumed that all construction works will be undertaken with appropriate mitigation measures (e.g., temporary screening around working areas, use of silences and / or enclosures around noisy equipment).
		Chapter 20 Air Quality and Dust		The habitats within designated sites could be subject to indirect effects due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access).
		Chapter 27 Landscape and Visual Impacts		The designated ecological sites may be affected by construction activities both ecologically and on a landscape and visual level.
ECO-C-02	Direct impacts to habitats – construction activities, such as trenching, excavation and piling, and establishment of haul roads and temporary construction compounds resulting in temporary habitat loss, fragmentation and disturbance	**Chapter 22 Soils and Land Use**	**Sections 23.7.1.4, 23.7.1.5, 23.7.1.6** and **23.7.1.7.**	Changes in land uses could impact on ecological receptors, for example, the removal of trees or hedgerows or the loss of agricultural land.
		Chapter 19 Geology and Ground Conditions		Potential change to ground conditions (including chemical quality and physical properties) during construction could affect the quality and quantity of groundwater and hydrologically connected surface water receptors which could in turn affect valued ecological receptors which rely on these water sources. This could include valued habitats (e.g. grasslands, rivers and woodland).
		Chapter 21 Water Resources and Flood Risk		Potential changes to the hydrology, geomorphology and water quality could impact upon water-dependent biological communities and riparian habitats located in each catchment.
		Chapter 27 Landscape and Visual Impacts		Habitats may be impacted by construction activities both ecologically and on a landscape and visual level.

Impact ID	Impact and Project Activity	Related EIA Topic	Where Assessed in this PEIR Chapter	Rationale
		Chapter 31 Climate Change		Mitigation which aims to reduce the long-term impacts of construction activities upon habitats will need to take into account the potential future impacts of climate change on created / enhanced habitats.
ECO-C-03	Direct and indirect impacts on legally protected species – construction activities, such as trenching, excavation, piling and movement of plant and equipment, resulting in species disturbance and displacement	**Chapter 25 Noise and Vibration**	**Sections 23.7.1.8, 23.7.1.9, 23.7.1.10, 23.7.1.11, 23.7.1.12, 23.7.1.13, 23.7.1.14, 23.7.1.15, 23.7.1.16, 23.7.1.17** and **23.7.1.18**	Construction activities will result in new sources of noise and ground vibration. These have the potential to impact nearby wildlife such as breeding birds, bats (roosting and non-roosting), amphibians, riparian mammals, badgers, invertebrates and other terrestrial wildlife. It has been assumed that all construction works will be undertaken with appropriate mitigation measures (e.g., temporary screening around working areas, use of silences and / or enclosures around noisy equipment).
		Chapter 13 Offshore and Intertidal Ornithology		Construction activities may result in the disturbance of bird species which use both offshore and onshore habitats.
		Chapter 20 Air Quality and Dust		Potential changes to air quality (e.g., from fumes emanating from operating construction machinery) could affect nearby habitats. Animals which are not mobile could also be temporarily affected (whereas mobile animals would be expected to move away), including invertebrates, nesting birds, roosting bats and other small terrestrial animals.
Operation and Maintenance				
Impacts associated with the O&M phase and therefore their inter-relationships would be no greater than those identified for the construction phase.				
Decommissioning				
The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56). For this assessment, it is assumed that inter-relationships during the decommissioning phase would be of similar nature to those identified during the construction phase.				

23.9.2 Interactions

683. The impacts identified and assessed in this chapter have the potential to interact with each other. Potential interactions between impacts are identified in **Table 23-34**. Where there is potential for interaction between impacts, these are assessed in **Table 23-35** for each receptor or receptor group.

684. Interactions are assessed by development phase ("phase assessment") to see if multiple impacts could increase the overall effect significance experienced by a single receptor or receptor group during each phase. Following from this, a lifetime assessment is undertaken which considers the potential for multiple impacts to accumulate across the construction, O&M and decommissioning phases and result in a greater effect on a single receptor or receptor group. When considering synergistic effects from interactions, it is assumed that the receptor sensitivity remains consistent, while the magnitude of different impacts is additive.

Table 23-34 Onshore Ecology and Ornithology – Potential Interactions Between Impacts Throughout the Project's Lifetime

Construction, Operation and Maintenance

	ECO-C-01	ECO-C-02	ECO-C-03	ECO-C-04	ECO-O-01	ECO-O-02	ECO-O-03	ECO-O-04
Direct and indirect impacts to designated ecological sites (ECO-C-01)		Yes	Yes	No	Yes	No	No	No
Direct impacts to habitats (ECO-C-02)	Yes		Yes	Yes	No	Yes	No	No
Direct and indirect impacts on legally protected species (ECO-C-03)	Yes	Yes		Yes	No	No	Yes	No
Spread of invasive non-native species (ECO-C-04)	No	Yes	Yes		No	No	No	Yes
Direct and indirect impacts to designated ecological sites (ECO-O-01)	Yes	No	No	No		Yes	Yes	No
Direct impacts to habitats (ECO-O-02)	No	Yes	No	No	Yes		Yes	Yes
Direct and indirect impacts on legally protected species (ECO-O-03)	No	No	Yes	No	Yes	Yes		Yes
Spread of invasive non-native species (ECO-O-04)	No	No	No	Yes	No	Yes	Yes	

Decommissioning

The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56).

For this assessment, it is assumed that interactions during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.

Table 23-35 Interaction Assessment – Phase and Lifetime Effects

Receptor	Impact ID	Highest Significance Level			Phase Assessment	Lifetime Assessment
		Construction	Operation and Maintenance	Decommissioning		
Designated ecological sites	ECO-C-01 ECO-O-01	Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction	**Construction**: No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than minor adverse during the construction phase. Given the non-significant residual effect of predicted impacts, coupled with the adoption of appropriate mitigation measures, it is considered that there would either be no interactions between construction impacts, or that these interactions would not result in greater impacts than are assessed individually. **Operation and Maintenance**: No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than minor adverse during the O&M phase. Given the adoption of appropriate mitigation measures,and the anticipated absence of / limited potential for impacts during operation, it is considered that there would either be no interactions between operational impacts, or that these interactions would not result in greater impacts than are assessed individually. **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature to and no worse than construction impacts.	No greater than individually assessed impact. Impacts to designated nature conservation sites during construction and operation are expected to be, at most, minor adverse, and during decommissioning impacts are expected to be equivalent or less than those predicted during construction. It is therefore considered that over the Project's lifetime, these impacts would not interact to change the overall effect significance.

Receptor	Impact ID	Highest Significance Level			Phase Assessment	Lifetime Assessment
		Construction	Operation and Maintenance	Decommissioning		
Priority and ancient woodlands	ECO-C-02 ECO-O-02	Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction	**Construction:** No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than negligible to minor adverse during the construction phase. Given the non-significant residual effect of predicted impacts, coupled with the adoption of appropriate mitigation measures, it is considered that there would either be no interactions between construction impacts, or that these interactions would not result in greater impacts than are assessed individually. **Operation and Maintenance:** No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than negligible to minor adverse during the O&M phase. Given the adoption of appropriate mitigation measures, and the anticipated absence of / limited potential for impacts during operation, it is considered that there would either be no interactions between operational impacts, or that these interactions would not result in greater impacts than are assessed individually. **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature to and no worse than construction impacts. During decommissioning, any impacts to habitats are likely to be of no more than effect significances predicted during construction because the decommissioning footprint will likely be smaller, duration of works will likely be shorter, and impacts would be focused on those habitats which had previously been impacted during construction. It is possible that habitats which become established within the Onshore Development Area between construction and decommissioning would need to be cleared to accommodate decommissioning works, but the types of habitats which would become established between construction and decommissioning are, by their nature, quick to establish and therefore would be quick to recover post-decommissioning.	No greater than individually assessed impact. Impacts to valued / sensitive habitats during construction and operation are expected to be, at most, negligible to minor adverse, and during decommissioning impacts are expected to be equivalent or less than those predicted during construction. It is possible that some quickly regenerating habitats could experience cumulative impacts over the course of the Project (if such a habitat becomes established within the decommissioning footprint), but the overall impact during the lifetime of the Project would not be considered any more significant than during individual phases because these types of habitats would recover similarly quickly post-decommissioning. It is therefore considered that over the Project's lifetime, these impacts would not interact to change the overall effect significance.
Woodlands		Negligible	Negligible	TBC – Assumed no greater than construction		
Arable field margins		Minor Adverse	Negligible	TBC – Assumed no greater than construction		
Maritime Cliff and Slopes		Minor Adverse	Negligible	TBC – Assumed no greater than construction		
Riparian and Freshwater habitats		Minor Adverse	Negligible	TBC – Assumed no greater than construction		
Hedgerows - native		Minor Adverse	Negligible	TBC – Assumed no greater than construction		
Hedgerows-non-native and ornamental		Negligible	Negligible	TBC – Assumed no greater than construction		

Receptor	Impact ID	Highest Significance Level			Phase Assessment	Lifetime Assessment
		Construction	Operation and Maintenance	Decommissioning		
GCN	ECO-C-03 ECO-O-03	Moderate Adverse. Anticipated to be reduced to Minor Adverse subject to more specific mitigation measures detailed at ES stage.	Minor Adverse	TBC – Assumed no greater than construction	**Construction:** No greater than individually assessed impact. The construction phase is expected to have the most significant effects on protected and valued species due to larger footprint and longer duration of works than other phases. The impacts are considered to have residual effect significances judged at no more than minor adverse during the construction phase (accounting for more specific mitigation measures to be developed at ES stage). Given the non-significant residual effect of predicted impacts, coupled with the adoption of appropriate mitigation measures, it is considered that there would either be no interactions between construction impacts, or that these interactions would not result in greater impacts than are assessed individually. **Operation and Maintenance:** No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than minor adverse during the O&M phase. Given the adoption of appropriate mitigation measures, and the anticipated absence of / limited potential for impacts during operation, it is considered that there would either be no interactions between operational impacts, or that these interactions would not result in greater impacts than are assessed individually. **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature and no worse than construction impacts.	No greater than individually assessed impact. Impacts to protected and valued species during construction and operation are expected to be, at most, minor adverse, and during decommissioning impacts are expected to be equivalent or less than those predicted during construction. Given the anticipated smaller footprint and shorter duration of decommissioning works relative to construction, and limited requirements for O&M activities, there is considered to be no realistic potential for impacts to protected and valued species to cumulate over the lifetime of the Project. It is conceivable that some of the same populations (e.g. of nesting birds, GCN or badgers,) could be impacted both during construction and again during decommissioning, but given the long period between these events, any combined impacts would be no greater than those assessed at individual phases. It is also anticipated that relevant mitigation measures for protected and valued species (e.g. measures which ensure legal offences are avoided, such as destruction of birds' nests, GCN habitat or badger setts) would be adopted during decommissioning in the same manner they would be adopted during construction. It is therefore considered that over the Project's lifetime, these impacts would not interact to change the overall effect significance.
Badgers		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		
Roosting bats		Moderate Adverse. Anticipated to be reduced to Minor Adverse subject to more specific mitigation measures detailed at ES stage.	Minor Adverse	TBC – Assumed no greater than construction		
Foraging and commuting bats		Moderate Adverse. Anticipated to be reduced to Minor Adverse subject to more specific mitigation measures detailed at ES stage.	Minor Adverse	TBC – Assumed no greater than construction		
Overwintering and passage birds		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		

Receptor	Impact ID	Highest Significance Level			Phase Assessment	Lifetime Assessment
		Construction	Operation and Maintenance	Decommissioning		
Protected fish species	ECO-C-03 ECO-O-03	Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction	As above.	As above.
Invertebrates		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		
Otters		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		
Water voles		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		
Reptiles		Minor Adverse	Minor Adverse	TBC – Assumed no greater than construction		
Invasive non-native species	ECO-C-04 ECO-O-04	Negligible	Negligible	TBC – Assumed no greater than construction	**Construction:** No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than negligible during the construction phase. Given the non-significant residual effect of predicted impacts, coupled with the adoption of appropriate mitigation measures, it is considered that there would either be no interactions between construction impacts, or that these interactions would not result in greater impacts than are assessed individually. **Operation and Maintenance:** No greater than individually assessed impact. The impacts are considered to have residual effect significances judged at no more than negligible during the O&M phase. Given the adoption of appropriate mitigation measures, and the anticipated absence of / limited potential for impacts during operation, it is considered that there would either be no interactions between operational impacts, or that these interactions would not result in greater impacts than are assessed individually. **Decommissioning:** No greater than individually assessed impact. For assessment purposes, it is assumed that decommissioning impacts will be of similar nature and no worse than construction impacts.	No greater than individually assessed impact. The same preventative measures relating to INNS are assumed to be undertaken during the construction, O&M and decommissioning phases. O&M and decommissioning works are expected to involve relatively minor works compared with construction meaning the risk of spreading INNS should also be lower. However, it is possible that INNS will have spread or become more established relative to their status at construction phase, in which case the pre-mitigation impact during operation and decommissioning could increase. However, assuming appropriate mitigation measures are adopted (in line with measures due to be adopted at the construction phase) there would be no realistic potential for additive impacts through the lifetime of the Project. It is therefore considered that over the Project's lifetime, these impacts would not interact to change the overall effect significance.

23.10 Monitoring Measures

685. Potential monitoring measures for onshore ecology and ornithology will be developed where required through the EIA process and identified in the ES. Monitoring requirements will be described within the Outline EcoMP and the Outline LMP to be developed at ES stage and submitted with the DCO application (see **Table 23-5**, Commitment IDs CO65 and CO81).

23.11 Summary

686. **Table 23-36** presents a summary of the preliminary results of the assessment of likely significant effects on onshore ecology and ornithology during the construction, operation and decommissioning of the Project.

23.12 Next Steps

687. At PEIR stage, the assessment has been undertaken based on a worst-case scenario due to existing data gaps. These data gaps comprise ecological baseline data and refined Project design. To address the ecological baseline data gaps, additional surveys will continue between the time of writing and the DCO application submission to fully establish the ecological baseline of the Onshore Development Area in the ES (the proposed suite of surveys are listed within **Table 23-8**). The outputs of these further surveys will be reported in the ES and will be used, in combination with refinements of the Project Design Envelope, to inform the final impact assessment and recommendation of appropriate, site-specific mitigation measures. Refinements of the Project Design Envelope at ES stage will also contribute to a more detailed assessment of direct impacts on statutory and non-statutory sites, such as LWS and the Leven Canal SSSI, which will be included in the ES.

688. In addition, an Outline BNG Strategy will be developed at ES stage for the DCO application submission to assess the biodiversity value of the Onshore Development Area pre-development and post-development (and, if applicable, any off-site areas) (Commitment ID CO82).

Table 23-36 Summary of Potential Effects Assessed for Onshore Ecology and Ornithology

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
Construction									
ECO-C-01	Direct and indirect impacts to designated ecological sites – construction activities, such as trenching, excavation, piling and movement of plant and equipment	CO32 CO33 CO35 CO36 CO38 CO39 CO40 CO41 CO42 CO46 CO47 CO55 CO65 CO70 CO81 CO83 CO85 CO100 CO101	Greater Wash SPA	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.
			Humber Estuary SAC, SPA and Ramsar	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Leven Canal SSSI	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Bryan Mills Field SSSI	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Burton Bushes SSSI	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Tophill Low SSSI	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Pulfin Bog SSSI	**High**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Beverley Parks LNR	**Medium**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Non-statutory sites	**Medium**	Negligible	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
ECO-C-02	Direct impacts to habitats – construction activities, such as trenching, excavation and piling, and establishment of haul roads and temporary construction compounds resulting in temporary habitat loss, fragmentation and disturbance	CO23 CO32 CO33 CO35 CO36 CO38 CO39 CO40 CO41 CO42 CO46 CO47 CO55 CO59 CO65 CO70 CO81 CO82 CO100 CO101	Priority and ancient woodlands	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.
			Woodlands	**Medium**	**Negligible**	**Negligible(Not Significant)**	N/A	**Negligible (Not Significant)**	
			Arable field margins	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Maritime cliff and slopes	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Riparian and freshwater habitats - lowland fen, coastal and floodplain grazing marsh, and reedbed priority habitats	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Riparian and freshwater habitats - running and standing waterbodies	**Low**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
			Hedgerows - native	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Hedgerows- non-native and ornamental	**Negligible**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
ECO-C-03	Direct and indirect impacts on legally protected species – construction activities, such as trenching, excavation, piling and movement of plant and equipment, resulting in species	CO32 CO33 CO35	GCN	**High**	**Medium**	**Moderate Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at	**Potential residual effect: Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
	disturbance and displacement	CO36 CO38 CO39 CO40 CO41 CO42 CO46 CO47 CO55 CO65 CO70 CO81 CO82 CO84 CO85 CO86 CO87 CO88 CO89 CO90 CO91 CO92 CO100 CO101					ES stage.		
			Badgers	**Medium**	**Medium Adverse**	**Moderate Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	
			Roosting bats	**High**	**Medium Adverse**	**Major Adverse (significant in EIA terms)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: up to Moderate Adverse (Significant)** (anticipated to be reduced to **Minor Adverse** subject to more specific mitigation measures detailed at ES stage)	
			Foraging and commuting Bats	**High**	**Medium Adverse**	**Major Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: up to Moderate Adverse (Significant in EIA terms)** (anticipated to be reduced to **Minor Adverse** subject to more specific mitigation measures detailed at ES stage)	
			Overwintering and passage birds	**High**	**Medium**	**Moderate Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	
			Breeding birds	**High**	**High**	**Major Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
			Protected fish species	**High**	**Low**	**Moderate Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	
			Invertebrates	**Medium**	**Low**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Otters	**High**	**High**	**Major Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	
			Water voles	**High**	**High**	**Major Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	
			Reptiles	**Medium**	**Medium**	**Moderate Adverse (Significant)**	Indicative measures outlined in **Section 23.7.4**, to be confirmed at ES stage.	**Potential residual effect: Minor Adverse (Not Significant)**	

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
ECO-C-04	Spread of invasive non-native species – construction activities, such as trenching, excavation, piling and movement of plant and equipment	CO32 CO33 CO35 CO39 CO42 CO46 CO47 CO81	Invasive non-native species	**Medium**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
Operation and Maintenance									
ECO-O-01	Direct and indirect impacts to designated ecological sites – routine and unplanned maintenance activities, such as unscheduled excavations and presence of above-ground infrastructure during operation	CO60 CO61 CO63 CO66 CO71 CO81 CO83	Statutory designated sites	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.
			Non-statutory designated sites	**Medium**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
ECO-O-02	Direct impacts to habitats – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in temporary habitat loss, fragmentation and disturbance, and presence of above-ground infrastructure during operation with potential for long-term habitat loss, fragmentation and disturbance	CO59 CO60 CO61 CO81 CO82	Priority and ancient woodlands and veteran trees	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.
			Woodlands	**Medium**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
			Arable field margins	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Maritime cliff and slopes	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
			Riparian and freshwater habitats - lowland fen, coastal and floodplain grazing marsh, and reedbed priority habitats	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	
			Riparian and freshwater habitats - running and standing waterbodies	**Low**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
			Hedgerows - native	**High**	**Negligible**	**Minor Adverse (Not Significant)**		**Minor Adverse (Not Significant)**	
			Hedgerows- non-native and ornamental	**Negligible**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	
ECO-O-03	Direct and indirect impacts on legally protected species – routine and unplanned maintenance activities, such as unscheduled excavations, resulting in species disturbance and displacement, and presence of above-ground infrastructure during operation with potential for displacement and light or noise disturbance	CO36 CO66 CO71 CO81 CO82	All legally protected species	**High**	**Negligible**	**Minor Adverse (Not Significant)**	N/A	**Minor Adverse (Not Significant)**	To be identified at ES stage where relevant.

Impact ID	Impact and Project Activity	Embedded Mitigation Measures	Receptor	Receptor Importance	Impact Magnitude	Effect Significance	Additional Mitigation Measures	Residual Effect	Monitoring Measures
ECO-O-04	Spread of invasive non-native species – routine and unplanned maintenance activities such as unscheduled excavations	CO81	Invasive non-native species	**Medium**	**Negligible**	**Negligible (Not Significant)**	N/A	**Negligible (Not Significant)**	To be identified at ES stage where relevant.
Decommissioning									
ECO-D-01	Direct and indirect impacts to designated ecological sites – decommissioning activities not yet defined	CO56	The details and scope of onshore decommissioning works will be determined by the relevant regulations and guidance at the time of decommissioning and provided in the Onshore Decommissioning Plan (see **Table 23-5**, Commitment ID CO56). This will include a detailed assessment of decommissioning impacts and appropriate mitigation measures to avoid significant effects. For this assessment, it is assumed that impacts during the decommissioning phase would be of similar nature to, and no worse than, those identified during the construction phase.						
ECO-D-02	Direct impacts to habitats – decommissioning activities not yet defined								
ECO-D-03	Direct and indirect impacts on legally protected species – decommissioning activities not yet defined								
ECO-D-04	Spread of invasive non-native species – decommissioning activities not yet defined								

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List of Acronyms

Acronym	Definition
CoCP	Code of Construction Practice
DCO	Development Consent Order
EA	Environment Agency
ECC	Export Cable Corridor
EcoMP	Ecological Management Plan
EPP	Evidence Plan Process
ETG	Expert Topic Group
EPS	European Protected Species
GCN	Great Crested Newt
GLTA	Ground Level Tree Assessment
HRA	Habitat Regulations Assessment
HSI	Habitat of Significant Importance
ILA	Important Landscape Areas
LMP	Landscape Management Plan
LNR	Local Nature Reserve
LWS	Local Wildlife Site
NEYEDC	North and East Yorkshire Ecological Data Centre

Acronym	Definition
NNR	National Nature Reserve
Outline EcoMP	Outline Ecological Management Plan
Outline LMP	Outline Landscape Management Plan
Outline CoCP	Outline Code of Construction Practice
OCS	Onshore Converter Station
PEA	Preliminary Ecological Appraisal
PEAR	Preliminary Ecological Appraisal Report
PEIR	Preliminary Environmental Information Report
PPP	Pollution Prevention Plan
PRBA	Preliminary Bat Roost Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK BAP	UK Biodiversity Action Plan
WCA	Wildlife and Countryside Act
YWT	Yorkshire Wildlife Trust Reserve