Outer Dowsing Offshore Wind

Environmental Statement

Chapter 21 Onshore Ecology

Volume 1 Chapters

Date: March 2025

Document Reference: 6.1.21
Pursuant to APFP Regulation: 5(2)(a)
Rev: 2.0

Company:		**Outer Dowsing Offshore Wind**		Asset:		**Whole Asset**
Project:		**Whole Wind Farm**		Sub Project/Package:		Whole Asset
Document Title or Description:		Chapter 21 Onshore Ecology				
Internal Document Number:		PP1-ODOW-DEV-CS-REP-0129_02		3rd Party Doc No (If applicable):		N/A
Rev No.	**Date**	**Status / Reason for Issue**	**Author**	**Checked by**	**Reviewed by**	**Approved by**
1.0	March 2024	DCO Application	SLR	SLR	Shepherd and Wedderburn	Outer Dowsing Offshore Wind
2.0	March 2025	Examination Update ES Changes: updates to reflect, where relevant: clarifications to date in Examination; correcting errata; additional commitments made through Examination; and changes to status of or addition of cumulative projects.	SLR	SLR	Shepherd and Wedderburn	Outer Dowsing Offshore Wind

Table of Contents

Table of Tables

Table of Figures (Volume 2)

- Figure 21.7 [This figure is confidential. See Appendix 21.5 Confidential Badger Desk Study and Field Survey (Document Reference 6.3.21.5)]
- Figure 21.8 Bat Tree Roosts Impact Assessment (document reference 6.2.21.8)
- Figure 21.9 Otter and Water Vole Impacts Assessment (document reference 6.2.21.9)

Acronyms and Terminology

Abbreviations / Acronyms

Acronym	Description
AoS	Area of Search
APIS	Air Pollution Information System
AQMP	Air Quality Management Plan
BAEF	Boston Alternative Energy Facility
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BNG	Biodiversity Net Gain
CIC	Cable Installation Compound
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CMS	Construction Method Statement
DAS	Discretionary Advice Service
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
EA	Environment Agency
ECC	Export Cable Corridor (offshore ECC or indicative Order Limits)
EcIA	Ecological Impact Assessment
EcMS	Ecological Management Strategy
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Ecology Management Plan
EnMS	Environmental Management System
EPP	Evidence Plan Process
EPS	European Protected Species
EPSL	European Protected Species Licence
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
FHQ	Fish Habitat Quality
GCN	Great Crested Newt
GIS	Geographical Information System
GLNP	Greater Lincolnshire Nature Partnership
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Assessment

Acronym	Description
HSI	Habitat Suitability Index
IAQM	Institute of Air Quality Management
IDB	Internal Drainage Board
IEF	Important Ecological Feature
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
IPA	Important Plant Areas
IPC	Infrastructure Planning Commission
ISIS	Invertebrate Species-Habitat Information System
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LBAP	Lincolnshire Biodiversity Action Plan
LCC	Lincolnshire County Council
LMP	Landscape Management Plan
LNR	Local Nature Reserve
LONI	Letter of No Impediment
LPA	Local Planning Authority
LWS	Local Wildlife Site
LWT	Lincolnshire Wildlife Trust
MAGIC	Multi-agency Geographic Information Centre
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMU	Minimum Mapping Unit
MS	Method Statement
N/A	Not Applicable
NIA	Nature Improvement Area
NERC	Natural Environment and Rural Communities
NGET	National Grid Electricity Transmission
NGSS	National Grid Substation
NGR	National Grid Reference
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
ODOW	Outer Dowsing Offshore Wind (The Project)
OLEMS	Outline Landscape and Ecological Management Strategy
OnSS	Onshore Substation
OS	Ordnance Survey
OSMP	Outline Soil Management Plan
OWF	Offshore Wind Farm

Acronym	Description
PCC	Primary Construction Compound
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PPEIRP	Pollution Prevention and Emergency Incident Response Plan
PRA	Preliminary Roost Inspections
RAM	Reasonable Avoidance Measures
RIAA	Report to inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAT	Species Assemblage Types
SCC	Secondary Construction Compound
SMP	Soil Management Plan
SoS	Secretary of State
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay
UK	United Kingdom
UKBAP	
WFD	Water Framework Directive
ZoI	Zone of Influence

Terminology

Term	Definition
400kV cables	High-voltage cables linking the OnSS to the NGSS.
400kV cable corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Baseline	The status of the environment at the time of assessment without the development in place.
Biodiversity Net Gain	An approach to development that leaves biodiversity in a measurably improved state than it was previously. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected, to ensure that the current loss of biodiversity through development will be halted and ecological networks can be restored.

Term	Definition
Cable circuit	A number of electrical conductors necessary to transmit electricity between two points bundled as one cable or taking the form of separate cables, and may include one or more auxiliary cables (normally fibre optic cables).
Cable ducts	A duct is a length of underground piping which is used to house the Cable Circuits.
Connection Area	An indicative area for the NGSS.
Cumulative Effect	The combined effect of the Project acting cumulatively with the effects of a number of different projects, on the same single receptor/resource.
Cumulative Impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Damage	Damage here means any form of adverse impact such as loss of habitat, soil compaction, changes in hydrology, nutrient enrichment, pollution, disturbance of species, spread of invasive species, etc.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact.
Environmental Impact Assessment (EIA)	A statutory 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, which fulfils the assessment requirements of the Environmental Impact Assessment (EIA) Regulations, including the publication of an Environmental Statement (ES).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Statement (ES)	The suite of documents that detail the processes and results of the Environmental Impact Assessment (EIA).
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.
Export Cable	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Habitats Regulations Assessment (HRA)	Habitats Regulations Assessment. A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Haul Road	The track within the Order Limits which the construction traffic would use to facilitate construction.

Term	Definition
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Intertidal	Area where the ocean meets the land between high and low tides.
Joint Bays	A Joint Bay provides a secure environment for the assembly of cable joints as well as bonding and earthing leads. A Joint Bay is installed between each length of cable.
Landfall	The location at the land-sea interface where the offshore export cable and fibre optic cables will come ashore.
Link Boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Maximum Design Scenario	The project design parameters, or a combination of project design parameters that are likely to result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures, or commitments, are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Grid Onshore Substation (NGSS)	The National Grid substation and associated enabling works to be developed by the National Grid Electricity Transmission (NGET) into which the Project's 400kV Cables would connect.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon.
Non-statutory consultee	Organisations that the Applicant may be required to (under Section 42 of the 2008 Act) or may otherwise choose to engage during the pre-application phases (if, for example, there are planning policy reasons to do so) who are not designated in law but are likely to have an interest in a proposed development.
Onshore substation (OnSS)	The Project's onshore substation, containing electrical equipment to enable connection to the National Grid.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Order Limits	The area subject to the application for development consent. The limits shown on the works plans within which the Project may be carried out.
Outer Dowsing Offshore Wind (ODOW)	The Project.
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process in the pre-application phase. The PEIR documentation is superseded by Project's Order Limits that will accompany the application for the Development Consent Order (DCO).

Term	Definition
Priority Habitats	The list of habitats of principal importance in England includes 56 habitats first identified as Priority Habitats in the UK Biodiversity Action Plan (UK BAP) and subsequently adopted under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Statutory Consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to the Project and the DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.
Study Area	Area(s) within which environmental impact may occur – Area within which the desk-based studies for habitats and species have been undertaken. Habitats and species have bespoke study areas which are described within this chapter. See also Zone of Influence.
Survey Area	Area within which the field-based surveys for habitats and species have been undertaken. Habitats and species may have bespoke survey areas.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure
Transition Joint Bay (TJB)	The offshore and onshore cable circuits are jointed on the landward side of the sea defences/beach in a Transition Joint Bay (TJB). The TJB is an underground chamber constructed of reinforced concrete which provides a secure and stable environment for the cable.
Trenched technique	Trenching is a construction excavation technique that involves digging a narrow trench in the ground for the installation, maintenance, or inspection of pipelines, conduits, or cables.
Trenchless technique	Trenchless technology is an underground construction method of installing, repairing and renewing underground pipes, ducts and cables using techniques which minimize or eliminate the need for excavation. Trenchless technologies involve methods of new pipe installation with minimum surface and environmental disruptions. These techniques may include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.
Zone of Influence	The area(s) over which ecological receptors may be affected by the biophysical changes caused by the Project and associated activities.

Reference Documentation

Document Number	Title
6.1.3	Project Description
6.1.4	Site Selection and Consideration of Alternatives
6.1.5	EIA Methodology
6.1.9	Benthic and Intertidal Ecology
6.1.11	Marine Mammals
6.1.12	Offshore and Intertidal Ornithology
6.1.19	Onshore Air Quality
6.1.20	Onshore Archaeology and Cultural Heritage
6.1.22	Onshore Ornithology
6.1.23	Geology and Ground Conditions
6.1.24	Hydrology and Flood Risk
6.1.26	Noise and Vibration
6.1.27	Traffic and Transport
6.1.28	Landscape and Visual Assessment
6.1.30	Human Health
6.3.21.1	Onshore Ecology Desk Based Assessment
6.3.21.2	UK Habitat Survey Report
6.3.21.3	Important Hedgerows Report
6.3.21.4	Bat Surveys
6.3.21.5	CONFIDENTIAL Badger Desk Study and Field Survey
6.3.21.6	Riparian Mammal Report
6.3.21.7	Great Crested Newt Report
6.3.21.8	Reptile Habitat Suitability Study
6.3.21.9	Invertebrates Study
6.3.21.10	Fish Habitat Study

21 Onshore Ecology

21.1 Introduction

1. This chapter of the Environmental Statement (ES) presents the Environmental Impact Assessment (EIA) process and outcomes for the proposed Outer Dowsing Offshore Wind ("the Project") on Onshore Ecology excluding Onshore Ornithology. This Chapter considers the potential impact of the Project from the mean low water spring (MLWS) landfall, along the Onshore Export Cable Corridor (ECC), and incorporating the Onshore Substation (OnSS) with the 400kV cable corridor, during the construction, operation and maintenance, and decommissioning phases.
2. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) located approximately 54km from the Lincolnshire coastline, export cables to landfall, onshore cables, an onshore substation, connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description 6.1.3 for full details).
3. This chapter is supported by, and summarises, the information contained within the following Supporting Documents and Technical Appendices in Volume 3:
   - Outline Document 8.10: Outline Landscape and Ecology Management Strategy (OLEMS)
   - Supporting Document 9.5: Biodiversity Net Gain (BNG) Project Principles and Approach Statement
   - Appendix 21.1 Onshore Ecology Desk Based Study (Document Reference 6.3.21.1)
   - Appendix 21.2 UK Habitat Survey (Document Reference 6.3.21.2)
   - Appendix 21.3 Important Hedgerows Survey (Document Reference 6.3.21.3)
   - Appendix 21.4 Bat Survey (Document Reference 6.3.21.4)
   - Appendix 21.5 Confidential Badger Desk Study and Field Survey (Document Reference 6.3.21.5)
   - Appendix 21.6 Riparian Mammal Surveys (Document Reference 6.3.21.6)
   - Appendix 21.7 Great Crested Newt Surveys (Document Reference 6.3.21.7)
   - Appendix 21.8 Reptile Habitat Suitability Study (Document Reference 6.3.21.8)
   - Appendix 21.9 Invertebrates Study (Document Reference 6.3.21.9)
   - Appendix 21.10 Fish Habitat Study (Document Reference 6.3.21.10)
4. This chapter should be read alongside the following chapters and documents:
   - Chapter 9: Benthic and Intertidal Ecology (Document Reference 6.1.9)
   - Chapter 11: Marine Mammals (Document Reference 6.1.11)

- Chapter 12: Offshore and Intertidal Ornithology (Document Reference 6.1.12)
- Chapter 19: Air Quality (Document Reference 6.1.19)
- Chapter 22: Onshore Ornithology (Document Reference 6.1.22)
- Chapter 23: Geology and Ground Conditions (Document Reference 6.1.23)
- Chapter 24: Hydrology, Hydrogeology and Flood Risk (Document Reference 6.1.24)
- Chapter 26: Noise and Vibration (Document Reference 6.1.26)
- Chapter 27: Traffic and Transport (Document Reference 6.1.27)
- Chapter 28: Landscape and Visual Assessment (Document Reference 6.1.28)
- Chapter 31: Climate Change (Document Reference 6.1.31)

21.2 Statutory and Policy Context

5. The relevant legislation and planning policy for offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to onshore ecological processes, is outlined in Table 21.1 Legislation and Policy Context below.

Table 21.1 Legislation and Policy Context

Legislation/policy	Key provisions	Section where key provisions addressed
Legislation		
Conservation of Habitats and Species Regulations 2017	Protection of Special Areas of Conservation (SAC) – see Ornithology Chapter for information relating to sites designated for birds. Protection of certain animal species and their resting places or shelter, including but not limited to all species of bat, great crested newt (*Triturus cristatus)*, otter (*Lutra lutra)* and natterjack toad (*Epidalea calamita*). Protection of certain plant species, including but not limited to creeping marshwort (*Apium repens*) and floating-leaved water plantain (*Luronium natans*). A Report to Inform Appropriate Assessment (RIAA) has been undertaken and is reported separately, however the findings of the assessment have informed this Chapter in relation to likely significant effects on Special Areas of Conservation (SACs).	The relevant provisions of the Conservation of Habitat and Species Regulations are addressed in Section 21.9.
Wildlife and Countryside Act 1981	Protection of certain animals and plant species and their place of shelter or protection including species of bird listed under Schedule 1, species of invertebrate, all species of bat, water vole (*Arvicola amphibius*) and otter listed under Schedule 5, plant species protected under Schedule 8. Prohibition of allowing certain non-native plant species listed in Schedule 9to grow or spread in the wild.	The relevant provisions of the Wildlife and Countryside Act are addressed in Section 21.9.
The Environment Act 2021	The Environment Act has wide ranging provisions including those around Environmental governance, Environmental regulation, Waste and resource efficiency, Air quality and environmental recall, Water, Nature and biodiversity, and Conservation covenants. Schedule 15 of the 2021 Act is of particular relevance and introduces “biodiversity gain in nationally significant infrastructure projects (NSIP)”. The part of the Environment Act relating to biodiversity net gain (and the associated amendments to the Planning Act 2008) is not yet in force, with the parts relating to NSIPs unlikely to commence until November 2025.	The relevant provisions of the Environment Act are addressed in section 21.9.

Legislation/policy	Key provisions	Section where key provisions addressed
Protection of Badgers Act 1992	Protection of badgers (*Meles meles)* from killing and injury (section 1) and disturbance whilst occupying a sett (section 3). The 1992 Act makes it an offence to obstruct, damage or destroy a sett (section 3).	The relevant provisions of the Protection of Badgers Act are provided in the Confidential Badger Survey (Document Reference 6.3.21.10).
Natural Environment and Rural Communities (NERC) Act 2006	This Act obliges the Secretary of State (SoS) to compile a list of habitats and species of principal importance in England. The list includes 56 habitats and 943 species first identified as Priority Habitats and species in the UK Biodiversity Action Plan. Relevant Priority Habitats are detailed in Section 1.4 Priority species include common toad, natterjack toad, great crested newt, species of alga, invertebrates, birds, fish, fungi, lichen, water vole, otter, hedgehog (*Erinaceus europaeus)*, brown hare (*Lepus lepus*, harvest mouse (*Micromys minutus)*, common seal (*Phoca vitulina*), noctule bat (*Nyctalus noctule)*, barbastelle bat (*Barbastellus barbastellus)*, Bechstein's bat (*Myotis bechsteinii)*, soprano pipistrelle bat (*Pipistrellus pygmaeus)* and brown long-eared bat (*Plecotus auritus)*.	The relevant provisions of the NERC Act are addressed in Section 21.9.
Hedgerow Regulations 1997	Protection of hedgerows deemed "important" under ecological or historical criteria set out in the Regulations.	The relevant provisions of the Hedgerow Regulations are addressed in section 21.9.
The Water Environment (Water Framework Directive (England and Wales) Regulations 2017 (as amended)	The Water Framework Directive was transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations). Part 3 of the regulations provide for the protection of areas of habitats or species where maintenance of the status of water is an important factor. Under the regulations additional consideration may need to be given to sites in the form of a Water Framework Directive (WFD) assessment where a project lies in proximity to a water body or to linked water bodies which could be affected. This includes consideration of whether water bodies are WFD receptors, in particular those of high status or which have high status morphology.	WFD assessment is provided in Chapter 23 (Document Reference 6.1.23).
National Planning Policy		
Government Circular 06/05	This circular provides administrative guidance on the application of Biodiversity and geological conservation law relating to planning and nature conservation as it applies	The relevant guidance is taken into account in sections 21.5, 21.6 and 21.9.

Legislation/policy	Key provisions	Section where key provisions addressed
	in England. It complements the national planning policy in the National Planning Policy Framework and the relevant planning practice guidance.	
National Planning Policy Framework (December 2023)	<u>*Section 15: Conservating and enhancing the natural environment:*</u> *180. 'Planning policies and decisions should contribute to and enhance the natural and local environment by:* *a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);* *b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;* *c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;* *d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures….'* *181. 'Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'* *[*para 182 – 184 relate specifically to National Parks, the Broads and Areas of Outstanding Natural Beauty and Heritage Coasts] *185. To protect and enhance biodiversity and geodiversity, plans should:* *a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and,*	Volume 1, Chapter 4 Site Selection and Consideration of Alternatives (Document Reference 6.1.4) illustrates how direct impacts on designated sites have been avoided through project design. Also, how blocks of woodland are avoided and the loss of individual trees and hedgerows has been minimised. Embedded mitigation measures are provided in Section 21.7. Further mitigation measures, including those for biodiversity offsetting, are presented within Outline Landscape and Ecological Management Strategy (OLEMS) (Document Reference 8.10). The hierarchy of designated sites is provided in Section 21.5. Priority Habitats have been included within the desk-based study (Section 21.5) and impacts are assessed in Section 21.9.

Legislation/policy	Key provisions	Section where key provisions addressed
	b) promote the conservation, restoration and enhancement of Priority Habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.' *186. When determining planning applications, local planning authorities should apply the following principles:* *a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;* *b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;* *c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[67] and a suitable compensation strategy exists; and* *d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.*	
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.2: 'In the 25 *Year Environment Plan, the government set out its vision for a quarter of a century action to help the natural work regain and retain good health. A commitment to review the plan every 5 years was set into law in the Environment Act 2021. The Environment Improvement Plan was published in 2023, which reinforces the intent of the 25 Year Environment Plan and sets out a plan to deliver on its framework and vision. The government's policy for biodiversity in England is set out in the Environmental Improvement Plan 2023, the National Pollinator Strategy and the UK Marine Strategy. The aim is to halt overall biodiversity loss in England by 2030 and*	Embedded mitigation measures are presented in Section 21.7.

Legislation/policy	Key provisions	Section where key provisions addressed
	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. This aim needs to be viewed in the context of the challenge presented by climate change. Healthy, naturally functioning ecosystems and coherent ecological networks will be more resilient and adaptable to climate change effects. Failure to address this challenge will result in significant adverse impact on biodiversity and the ecosystem service it provide.	
Overarching NPS for Energy 2023 (EN-1)	Para 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'.*	Designated sites are presented in Section 21.5. The route options have been selected to minimise impacts to interest features within designated sites. Embedded mitigation measures are provided in Section 21.7.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.17: *Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance (including those outside England), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats.*	An assessment of effects is presented in Section 21.9.
Overarching NPS for Energy 2023 (EN-1)	Para 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 21.7. Biodiversity Net Gain Report (Principles and Approach) (Report) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric.

Legislation/policy	Key provisions	Section where key provisions addressed
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.20: '*Applicants should consider wider ecosystem services and benefits of natural capital when designing enhancement measures'*	Biodiversity Net Gain Report (Principles and Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG Principles, including Principle 9, relating to wider environmental benefits.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.21: *'As set out in Section 4.7, the design process should embed opportunities for nature inclusive design. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains (see Section 4.6 on Environmental and Biodiversity Net Gain). The scope of potential gains will be dependent on the type, scale, and location of each project.'*	Biodiversity Net Gain Report (Principles and Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.32: *'Applicants should include measures to mitigate fully the direct and indirect effects of development on ancient woodland, ancient and veteran trees or other irreplaceable habitats during both construction and operational phase.'*	Embedded mitigation measures are provided in Section 21.7.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.33: '*Applicants should also consider any reasonable opportunities to maximise the restoration, creation, and enhancement of wider biodiversity, and the protection and restoration of the ability of habitats to store or sequester carbon'*	Embedded mitigation measures are provided in Section 21.7. Biodiversity Net Gain Report (Principles and Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting Biodiversity Net Gain Principles.
Overarching NPS for Energy 2023 (EN-1)	*Para 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,*	Embedded mitigation measures are provided in Section 21.7. A management strategy for biodiversity is presented within the OLEMS (Document Reference 8.10).

Legislation/policy	Key provisions	Section where key provisions addressed
	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.	Biodiversity Net Gain Report (Principles & Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.36: *'Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction and operation stages.'*	A management strategy for biodiversity is presented within the OLEMS (Document Reference 8.10) Biodiversity Net Gain Report (Principles and Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.42 *As a general principle, and subject to the specific policies below, development should, in line with the mitigation hierarchy, aim to avoid significant harm to biodiversity and geological conservation interests, including through consideration of reasonable alternatives as set out in Section 4.3 above). Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought.*	Embedded mitigation measures are provided in Section 21.7. Biodiversity Net Gain Report (Principles & Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric, a key principle of which is the adoption of the mitigation hierarchy in project planning.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.44 *The Secretary of State should consider what appropriate requirements should be attached to any consent and/or in any planning obligations entered into, in order to ensure that any mitigation or biodiversity net gain measures, if offered, are delivered and maintained. Any habitat creation or enhancement delivered including linkages with existing habitats for compensation or biodiversity net gain should*	Mitigation measures, including those for biodiversity offsetting, are presented within OLEMS (Document Reference 8.10) submitted with ES.

Legislation/policy	Key provisions	Section where key provisions addressed
	generally be maintained for a minimum period of 30 years, or for the lifetime of the project, if longer.	
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.49 *The Secretary of State must consider whether the project is likely to have a significant effect on a protected site which is part of the National Site Network (a habitat site), a protected marine site, or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects*	A summary of the assessment of effects is presented in Section 21.9.
Overarching NPS for Energy 2023 (EN-1)	Para 5.4.50 *The Secretary of State should use requirements and/or planning obligations to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest.*	Embedded mitigation measures are provided in Section 21.7. Biodiversity Net Gain Report (Principles and Approach) (Document Reference 9.5) outlines the commitment of the Project to adopting BNG using the latest metric
NPS for Renewable Energy Infrastructure 2023 (EN-3)	Para 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.'*	Embedded mitigation measures are provided in Section 21.7.
NPS for Renewable Energy Infrastructure 2023 (EN-3)	Para 2.8.211: *'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.'*	The ecological monitoring strategy with measures relating to adaptive mitigation are set out in the OLEMS (Document Reference 8.10).
NPS for Electricity Networks Infrastructure 2023 (EN-5)	Paragraph 2.5.1*: 'When planning and evaluating the proposed development's contribution to environmental and biodiversity net gain, it will be important – for both the applicant and the Secretary of State – to supplement the generic guidance set out in EN-1 (Section 4.6) with recognition that the linear nature of electricity networks infrastructure can allow for excellent opportunities to:* *reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or connect people to the*	The Biodiversity Net Gain Project Principles and Approach Statement (Document Reference 9.5) outlines the commitment of the Project to adopting BNG.

Legislation/policy	Key provisions	Section where key provisions addressed
	environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements.	
The UK Biodiversity Action Plan (UK BAP): 1992-2012	The UK BAP set out definitions of Priority Habitats and Species which continue to be used to define habitats and species of principal importance listed by the SoS in response to obligations under S41 of the NERC Act.	The definitions provided within the UK BAP have been referred to in order to identify Important Ecological Features (IEFs) within the Chapter and associated appendices.
Local Planning Policy		
East Lindsey Core Strategy Strategic Policy 24 Biodiversity and Geodiversity	*1.'Development proposals should seek to protect and enhance the biodiversity and geodiversity value of land and buildings and minimise fragmentation and maximise opportunities for connection between natural habitats.* *2.The Council will protect sites designated internationally, nationally or locally for their biodiversity and geodiversity importance, species populations and habitats identified in the Lincolnshire Biodiversity Action Plan and the Natural Environment and Rural Communities (NERC) Act 2006. Development, which could adversely affect such a site, will only be permitted in exceptional circumstances:* *In the case of internationally designated sites, where there is no alternative solution and there are overriding reasons of public interest for the development;* *In the case of nationally designated sites, there is no alternative solution and the reasons for the development clearly outweigh the biodiversity value of the site; or* *In the case of locally designated sites, and sites that meet the criteria for selection as a Local Site, the reasons for the development clearly outweigh the need to protect the site in the long term.* *3. In exceptional circumstances, where adverse impacts are demonstrated to be unavoidable and development is permitted which would damage the nature conservation or geological value of a site, the Council will ensure that such damage is kept to a minimum and will ensure appropriate mitigation, compensation or enhancement of the site through the use of planning conditions or planning obligations. Compensation measures towards loss of habitat will be used only as a last resort where there is no alternative. Where any mitigation and compensation measures are required, they should be in place before development activities start that*	Important ecological receptors such as statutory and non-statutory designations will be avoided and safeguarded through careful design. Ancient woodlands have been scoped out of the assessment as there are no designations of this type within the Order Limits or 2km study area. The potential for impacts to ancient and veteran trees are considered within section 9.1.2, with mitigation and compensation measures set out section 3.6.3 of the OLEMS (document ref 8.10). Embedded mitigation measures are provided in Section 21.7. The Biodiversity Net Gain Project Principles and Approach Statement (document reference 9.5) outlines the commitment of the Project to adopting BNG.

Legislation/policy	Key provisions	Section where key provisions addressed
	may disturb protected or important habitats and species. Proposals to provide or enhance a site will be supported. *4.Where new habitat is created it should, where possible, be linked to other similar habitats to provide a network of such sites for wildlife.* *5.Planning permission will only be granted for development which directly or indirectly leads to loss or harm to ancient woodland or aged or veteran trees, in exceptional circumstances, where the developer can demonstrate that the wider benefits of that loss clearly outweigh the protection of the trees.'*	
East Lindsey Core Strategy SP 25 – Green Infrastructure	*'The Council will safeguard and deliver a network of accessible green infrastructure by:* *Protecting and safeguarding all greenspace identified through the Settlement Proposals DPD so that there is no net loss;* *Maximising opportunities for new and enhanced green infrastructure and publicly accessible open spaces in and around all communities;* *Seek opportunities to connect existing green infrastructure to improve the network of spaces and accessibility for both the local population and wildlife.* *In the case of sites not identified on the Inset Maps, development will only be permitted on open spaces provided unacceptable harm will not be caused to their appearance, character or role in providing: a locally important habitat.'*	Measures to achieve landscape connectivity and enhancement of networks are presented in the OLEMS (Document Reference 8.10) Section 21.5 provides details of all statutory and non-statutory designations within the study areas. Embedded mitigation measures are provided in Section 21.7. The Biodiversity and Net Gain Report (Principles and Approach) (Document ref 9.5) outlines the commitment of the Project to adopting BNG.
South East Lincolnshire Local Plan 2011-2036 Policy 28 – The Natural Environment	*'A high quality, comprehensive ecological network of interconnected designated sites, sites of nature conservation importance and wildlife-friendly greenspace will be achieved by protecting, enhancing and managing natural assets:* *a. Internationally-designated sites, on land or at sea:* *1(a) development proposals that would cause harm to these assets will not be permitted, except in exceptional circumstances, where imperative reasons of*	Measures to achieve landscape connectivity and enhancement of networks are presented in the OLEMS (Document Reference 8.10) Embedded mitigation measures are provided in Section 21.7. Further mitigation measures are presented in Section 21.9.

Legislation/policy	Key provisions	Section where key provisions addressed
	overriding public interest exist, and the loss will be compensated by the creation of sites of equal or greater nature conservation value;' *'Where the project-level HRA concludes that avoidance and/or mitigation measures are required, it is expected that;'* *1(iv)' Suitable Alternative Natural Greenspaces should be designed in accordance with capacity and facility requirements in relation to the developments they mitigate for, best practice elsewhere and relevant evidence.* *2. Nationally or locally-designated sites and protected or Priority Habitats and species:* *a. development proposals that would directly or indirectly adversely affect these assets will not be permitted unless:* *(a) i. there are no alternative sites that would cause less or no harm; and* *(a)ii. the benefits of the development at the proposed site, clearly outweigh the adverse impacts on the features of the site and the wider network of natural habitats; and* *(a)iii. suitable prevention, mitigation and compensation measures are provided.* *3. Addressing gaps in the ecological network:* *a. by ensuring that all development proposals shall provide an overall net gain in biodiversity, by:* *(a)i. protecting the biodiversity value of land, buildings and trees (including veteran trees) minimising the fragmentation of habitats;* *(a)ii. maximising the opportunities for restoration, enhancement and connection of natural habitats and species of principal importance;* *(a)iii. incorporating beneficial biodiversity conservation features on buildings, where appropriate; and maximising opportunities to enhance green infrastructure and ecological corridors, including water space; and* *(a)iv. conserving or enhancing biodiversity or geodiversity conservation features that will provide new habitat and help wildlife to adapt to climate change, and if the*	Alongside the ES, a RIAA has been produced (Document Reference 7.1).

Legislation/policy	Key provisions	Section where key provisions addressed
	development is within a Nature Improvement Area (NIA), contributing to the aims and objectives of the NIA.'	
Lincolnshire Biodiversity Action Plan: 2011 – 2020 3rd Edition (2011)	The Lincolnshire BAP sets out definitions of Priority Habitats and Species present within the county, refining, where appropriate, descriptions provided in the UK BAP.	The definitions provided within the Lincolnshire BAP have been referred to in order to identify IEFs within the Chapter and associated appendices.

21.3 Consultation

6. Consultation is a key part of the Development Consent Order (DCO) application process. Consultation regarding Onshore Ecology has been conducted through the following processes:
   - Evidence Plan Process (EPP) including Expert Technical Group (ETG) meetings;
   - EIA scoping process (ODOW, 2022);
   - Natural England's Discretionary Advice Service (DAS);
   - Section 47 consultation process (all public consultation phases including phase 1 and 1a); and,
   - Section 42 consultation process (including Phase 2 Consultation, Autumn Consultation and Targeted Winter Consultation).
7. The Project's technical consultation is summarised within Chapter 6 Technical Consultation (document reference 6.1.6) alongside the EPP specific consultation as contained in Appendix 6.1 Evidence Plan Process (Document Reference 6.3.6.1).
8. A summary of the key issues raised during consultation to date, specific to Onshore Ecology, are outlined below in Table 21.2, together with how these issues have been considered in the production of this Chapter.
9. The Scoping Opinion was based on an Area of Search (AoS) which was reduced and refined to the PEIR boundary prior to the publication of the PEIR, and again to the current Order Limits. Therefore, some Important Ecological Features (IEFs) highlighted at the scoping stage and within the PEIR are no longer within the Zone(s) of Influence of the Project. Some issues raised by stakeholders during the consultation process are therefore now considered redundant, as certain receptors are no longer at risk of being impacted. Any such instances are described within Table 21.5 below.

Table 21.2 Summary of Consultation relating to Onshore Ecology

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
9th June 2022 ETG Meeting	Representatives from Natural England and LCC. Project discussion surrounding the need for BNG and the incorporation of functionally linked habitats within the assessment.	An Biodiversity Net Gain Project Principles and Approach Statement has been produced and submitted as part of the DCO Application (Document Reference 9.5). Section 21.9 of this Chapter states that functionally linked habitats are being considered.
19th July 2022 ETG Meeting	Representatives from Natural England and LCC. Updates provided by the Project on survey progress.	Details of all onshore ecology surveys are provided in Appendices 21.2 to 21.9.
Scoping Opinion (the Planning Inspectorate, 9th September 2022) Comment ID: 3.15.1	Impacts to ancient woodland: *'The Scoping Report identifies that there is no ancient woodland present within 2km of Lincolnshire Node or Weston Marsh. The Inspectorate is content to scope out impacts to ancient woodland on the basis that the ES demonstrates ancient woodland would not be directly or indirectly affected by the Proposed Development.'*	Section 21.5.4 confirms no ancient woodland exists within 2km of the Order Limits.
Scoping Opinion (the Planning Inspectorate, 9th	Study area and data collection: *'The Environmental Statement (ES) should clearly define and justify the study area for each ecological feature, with reference to the Zone of Influence (ZoI) for the Proposed Development. The Applicant's attention is directed to the comments of Natural England (Appendix 2 of this Opinion) that identifies some concerns with regards to*	Natural England's comments have been taken into account and study areas were revised accordingly. Study areas and data sources referenced for each ecological feature are provided in section 21.4.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
September 2022) Comment ID: 3.15.2	*the spatial scope of the data sources, as specified in Table 8.3.1. The Applicant should seek to agree the sources and extent of data sources with relevant consultation bodies, including Natural England, as the onshore element of the scheme develops further.'*	Desk study data are summarised in Volume 3, Appendix 21.1: Desk Study (Document Reference 6.3.21.1).
Scoping Opinion (the Planning Inspectorate, 9th September 2022) Comment ID: 3.15.3	Mitigation measures for Invasive Non-Native Species (INNS): *'INNS are identified in the study areas. The ES should detail and secure mitigation/ biosecurity measures during all phases of the Proposed Development to avoid/ reduce the spread and introduction of INNS. Effort should be made to agree the approach with the relevant consultation bodies.'*	Section 21.4 details known records of INNS. Additional records from field survey work are presented in Section 21.5. Embedded mitigation (Section 21.9) includes measures to avoid the spread of INNS. Procedures for the management of Invasive Non-Native Species have been included within the OLEMS (Document Reference 8.10).
Scoping Opinion (the Planning Inspectorate, 9th September 2022) Comment ID: 3.15.4	Drilling fluid breakout plan: *'Scoping Report paragraph 3.6.6 states that high-speed directional drilling (HDD) may be utilised for construction. The ES should confirm where HDD will be employed and should this have potential to impact sensitive ecological features, appropriate mitigation, such as measures to be included in a drilling fluid breakout plan, should be described and appropriately secured.'*	Chapter 23 Geology and Ground Conditions (Document Reference 6.1.23) includes an assessment of the risk of trenchless frac out, with mitigation set out in the Outline Code of Construction Practice (CoCP) (document reference 8.1). Trenchless crossings have been included at key locations to avoid designated sites and sensitive ecological features. Those potential impacts on ecological features that cannot be avoided will be mitigated for, as set out in Section 21.9.
Scoping Opinion (the Planning Inspectorate,	Impacts to waterbodies, fish and freshwater species: *'Surveys are proposed for otter and water vole; however, impacts to fish and other freshwater species and on water quality have not been considered in the Onshore Ecology aspect Chapter of the Scoping Report. The ES should assess impacts*	All Environment Agency Main Rivers and Internal Drainage Board (IDB) drains will be crossed utilising trenchless techniques, however, impacts

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
9th September 2022) Comment ID: 3.15.5	*to fish and other freshwater species and on water quality, where significant effects are likely to occur, supported by desk study information and surveys as necessary. Effort should be made to agree the methodology with the relevant consultation bodies.'*	upon fish have been assessed, as presented in Section 21.9. Chapter 24 (Document Reference 6.1.24) presents an assessment of impacts on water quality.
Scoping Opinion (the Planning Inspectorate, 9th September 2022) Comment ID: 3.15.6	Survey methodologies: *'The Scoping Report contains limited detail concerning the proposed species-specific surveys for onshore ecology and at this stage, the location of the Order Limits and OnSS is not yet known. Effort should be made to agree the approach to surveys with relevant consultation bodies, including Natural England, as part of the EPP. The ES should detail the specific methodologies, this information could be included within appendices to the ES aspect Chapter.'*	Volume 3, Appendices 21.1 – 21.10 provide information regarding desk study and field survey work undertaken to date. The Project sought confirmation from Natural England on the survey approach to great crested newt (GCN) via the Discretionary Advice Service on 16th May 2023. No formal response was received, however further discussions on this topic were undertaken through the EPP and no comments on the survey methodology for GCN were raised.
Scoping Opinion (the Planning Inspectorate, 9th September 2022) Comment ID: 3.15.7	Confidential Annexes: *'Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES Chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.'*	Badger data has been presented in Appendix 21.5: CONFIDENTIAL Badger Desk Study and Field Survey (Document Reference 6.3.21.5). Only low-resolution data has been included in the ES.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Scoping Report Response	BNG: *'Lincolnshire Wildlife Trust (LWT) would have liked to see stronger commitments to biodiversity net gain (BNG) detailed in the Scoping Report (terrestrial and marine), given the importance of biodiversity recovery and the mandatory requirements that will be in place by the end of this proposed project. The main requirements of concern being:* *Minimum 10% gain required, calculated using the Biodiversity Metric, and approval of a biodiversity plan* *Habitat secured for at least 30 years via planning obligations and/or conservation covenants.'*	A Biodiversity Net Gain Project Principles and Approach Statement has been produced and submitted alongside this ES (Document Reference 9.5), which sets out measures to achieve up to 10% gain.
ETG 12th October 2022	The Project confirmed that ancient woodlands of <2ha will be included in the ES if records are made available by Greater Lincolnshire Nature Partnership (GLNP) in time for incorporation into the ES. The Project confirmed that the desk study for roosting bats will be increased to 5 km. The Project confirmed that surveys of breeding populations of natterjack toads at Saltfleetby-Theddlethorpe Dunes, fish and freshwater species, and mitigation measures for INNS will all be scoped into the assessment, along with functionally linked land between Within Wood and Hornby/ Mother Woods. Lincolnshire Wildlife Trust (LWT) outlined the need for Biodiversity Net Gain and a 30-year commitment to secure habitats.	Appendix 21.1 Desk Study (Document Reference 6.3.21.1) details the scope of the desk study. The OLEMS (Document Reference 8.10) sets out principles relating to mitigation and avoidance measures for INNS. A Biodiversity Net Gain Project Principles and Approach Statement has been produced as part of the ES (Document Reference 9.5)
Natural England DAS Response, letter dated 29th July 2022	Biodiversity Net Gain: *'While Natural England recognises that we are currently in the transition period before the requirements for Biodiversity Net Gain (BNG) delivery are mandatory for Nationally Significant Infrastructure Projects (NSIPs), Natural England strongly advises that the project engages with this at an early stage to maximise positive*	A Biodiversity Net Gain Project Principles and Approach Statement has been produced and submitted alongside this ES (Document Reference 9.5).

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	environmental impact and in order to ensure your project is future proofed.'	
Natural England DAS Response, letter dated 29th July 2022	*'Natural England advises that 'Moderate or large-scale impacts' need to be defined. Presence/likely absence surveys are not proposed for 'low potential habitat'. And whilst Reasonable Avoidance Measures (RAM) will be employed, Natural England would anticipate a contingency plan included within the Outline Landscape and Environment Management plan to account for situations where avoidance is not possible.'*	The OLEMS (Document Reference 8.10) sets out principles relating to mitigation and compensation for reptile habitat. The OLEMS outlines appropriate mitigation practices to ensure there are no significant adverse impacts on reptile populations (if present).
ETG 26th January 2023	The Project provided an update on the survey results to date and provided the scope for the impact assessment which will follow Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (2018). No comments were received.	Section 21.7 mirrors the approach outlined during the 26th January ETG.
Natural England Meeting 30th January 2023	Natural England asked for a justification around the decision for 2km study area for mobile species and 5km for roosting bats. Natural England ask that bat activity surveys cover the migration period for barbastelle bat and nathusius' pipistrelle bat (May and Sept/Oct).	The Project responded in a letter dated 17th February 2023 (Doc No. ODO-NAE-LET-0000008) (See Consultation Report (document 5.1) for a copy of the letter) to provide justification and confirmed that bat activity surveys would be carried out between May and October.
Meeting with Royal Society for the Protection of Birds (RSPB) (8th March 2023): Emailed comments	Greater Frampton Vision: Landscape Recovery Project: RSPB stated '*we currently have a landscape recovery project running in the area that will be looking at how the land to the south-east of Boston can be developed to expand the habitats that have developed so successfully at Frampton Marsh and Freiston Shore to seek to better link the reserve areas and provide a greater area for wildlife…..we have serious concerns about projects that would limit the ability to deliver the vision for the area. It was encouraging to hear about how the project might help deliver biodiversity benefits as part of net gain actions. We will be happy to explore these and potentially*	Additional consultation with the RSPB (including on site meetings) has been undertaken to provide assurances that the location and design of the Onshore ECC will be compatible with the Greater Frampton Vision. Opportunities to support and contribute to the Greater Frampton Vision are being explored with RSPB. Any commitments to the Vision will be clearly set out

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
from RSPB dated 8th March 2023	*how they could help us deliver the landscape work we would like to in the area, although this will be subject to securing sufficient certainties that a cable in this location was appropriate.'*	in the future Landscape Management Plan (LMP) and Ecology Management Plan (EMP).
ETG 26th January 2023	During the January ETG, the Project outlined the proposed approach to GCN surveys and requested consultee feedback: *"HSI for all ponds within 250m and wet/ seasonally wet ditches within 100 m.* *eDNA for all ponds and ditches with 'average' or above suitability within 250m of permanent or 100m of temporary habitat loss.* *population class assessments for ponds (only) within 250m of permanent or 100m of temporary habitat loss.* *appropriate mitigation and licensing for all waterbodies with evidence of GCN presence.* *Do the consultees support this approach?"* Natural England sought clarity on GCN survey methodology and licensing approaches.	The ETG meeting minutes and associated consultation logs are provided in Volume 3, Appendix 6.1: Evidence Plan Process Consultation (document reference 6.3.6.1). The DAS Letter was issued to Natural England regarding GCN surveys methods and licensing approaches in May 2023. The survey approach proposed within the letter was as described within this Chapter. The proposed licencing approach utilises Licencing Policy 1[1] to secure long-term habitat gains for GCN, whilst safeguarding the construction programme.
Section 42 Comments on the PEIR response, dated 20th July 2023	NE advised that: the ES should assess impacts on protected species in line with Standing Advice; they expect a mitigation management plan for any at-risk species included within the Outline Ecological and Landscape Management Strategy (OLEM) document, and the NE Wildlife Licencing Service team should be contacted directly to gain a letter of No Impediment (LONI).	Section 21.9 presents an assessment of impacts in line with Standing Advice provided by Natural England. The OLEMS (Document Reference 8.10) presents mitigation and management measures for impacts that have been identified.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
		LONIs have been received from NE with respect to GCN and water vole. No licensable impacts are predicted for bats, otter, or badger and so no LONI is required.
	NE advised that: the project should minimise hedgerow loss and that flight lines should not be disrupted during construction; trees that are lost and cannot be replaced in-situ, should be replaced within Order Limits at a greater number than have been removed; where hedgerows provide habitat for protected species, older plants and deer protection should be used to speed up establishment.	Extensive use of trenchless techniques along the onshore ECC and 400kV cable corridor has minimised impacts on hedgerows. A mitigation and compensation strategy for trees, with specific reference to ancient and veteran trees, is set out in the OLEMS (Document Reference 8.10). All hedgerow restoration will have the target of establishing an effective hedgerow within 5 years, which is the stated time to condition in BNG Metric 4 for native shrubby hedgerows without trees in moderate condition. Management and monitoring requirements will be detailed in the OLEMS (Document Reference 8.10).
	NE advised that: the Applicant has due regard to standing advice in relation to Ancient Woodland and Ancient and Veteran trees.	A mitigation and compensation strategy for trees, with specific reference to ancient and veteran trees, is set out in the OLEMS (Document Reference 8.10). The Project will not impact upon any ancient woodland, as this habitat is not present within 2km of the Order Limits.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	NE requested further project specific detail on BNG and what would be included for examination. Natural England advised that; Environmental Benefits from Nature tool may be used to identify nature and to avoid and minimise any negative impacts; The development should provide BNG in line with the National Planning Policy Framework (NPPF) paragraphs 174(d), 179 and 180; The development provides opportunities to secure wider environmental gains, as outlined in the NPPF (paragraphs 8, 73, 104, 120,174, 175 and 180). The Project follow the mitigation hierarchy as set out in paragraph 180 of the NPPF and consider retention and enhancement of existing ecological features.	The Project is exploring opportunities to deliver on the recent legislation that requires future NSIPs to provide 10% BNG and is actively engaging with organisations and environmental bodies local to the Project's footprint to identify potential collaboration opportunities. A Biodiversity Net Gain Project Principles and Approach Statement has been produced and submitted alongside this ES (Document Reference 9.5).
	Natural England advised there is a requirement to commit to using the latest version of the metric, as is relevant at the time of assessment.	The Biodiversity Metric 4.0 has been adopted by the Project, as set out in the Biodiversity Net Gain Project Principles and Approach Statement (Document Reference 9.5).
	Natural England advised that there is a need to embrace multifunctionality of BNG and consider the design of this project holistically with other project design principles. These include Sustainable Drainage Systems (SuDS; CIRA (2015)) and Green Infrastructure (Green Infrastructure Home (naturalengland.org.uk)). Natural England advised that a Bentonite Outbreak Management Plan is included within the OLEMS document.	Biodiversity Net Gain Project Principles and Approach Statement has been produced as part of the ES (Document Reference 9.5). Principles for bentonite breakout management included in an Outline Onshore Pollution Prevention and Emergency Incident Response Plan (document reference 8.1.4) provided as part of the Outline CoCP (document reference 8.1).

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	Natural England advised that a biosecurity management plan would be required as a mitigation measure.	Biosecurity measures to be adopted during construction are set out in the OLEMS (Document Reference 8.10)
	National Farmer's Union request clarification on approach to BNG.	A Biodiversity Net Gain Project Principles and Approach Statement (has been produced and submitted alongside this ES (Document Reference 9.5).
ETG 2nd August 2023	To address Canal and River's Trust comments, a hybrid assessment with the hydrology team to be undertaken to assess the mobilisation of sediments, which will determine the requirement for and/ or extent of the fish and invertebrate surveys required.	A Fish Habitat Suitability Assessment has been prepared as an appendix to this Chapter (see Appendix 21.10: Fish Habitat Study (Document Reference 6.3.21.9)).
ETG 18th September 2023	Survey and data analysis update provided to the group. Natural England advised that a letter of no impediment would be required.	Detailed survey results have been submitted within the relevant appendices 21.1 – 21.10 (document references 6.3.21.1 – 6.3.21.10) to this Chapter. LONIs have been received from NE with respect to GCN and water vole. No licensable impacts predicted for bats, otter or badger and so no LONI will be required.
Autumn Consultation Section 42 consultation on Project Refinements) dated 24th	Cable Route The cable route redline now excludes the Doves Lane Local Wildlife site near Butterwick and so it should not be impacted by the installation of the cables. The Hobhole Drain and Havenside LWS are crossed and this will be by direct drilling so should protect the habitat. The route also passes near to the 'South Bank Fosdyke' LWS that lies against the River Welland. The cable route is on the opposite bank and so will not	The Council's understanding of the alignment of the routing is correct as stated in Chapter 3 (document reference 6.1.3). Protection measures during construction are outlined in Outline Code of Construction Practice, which sets out measures to prevent air and water quality impacts.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
November 2023 Boston Borough Council	affect the LWS. However, what is assumed to be a haul road route, runs directly against the LWS and so protection measures need to be clearly stated. This haul route runs towards the National Grid substation site that will be considered in a separate application.	

[1] **Policy 1 - Greater flexibility when excluding and relocating European Protected Species (EPS) from development sites** Defra considers that compensation for EPS impacts can be delivered without the need to relocate or exclude populations, where: exclusion or relocation measures are not necessary to maintain the conservation status of the local population; the avoid-mitigate-compensate hierarchy is followed; and compensation provides greater benefits to the local population than would exclusion and/or relocation. Available at: Wildlife licensing: comment on new policies for European protected species licences - GOV.UK (www.gov.uk)

10. As described in Chapter 3 Project Description (Document Reference 6.1.3) and Chapter 4 Site Selection and Consideration of Alternatives (Document Reference 6.1.4), the Project design envelope has been refined through iterative design and stakeholder consultation and feedback through the EPP and formal public consultation.

11. The design has sought to minimise impacts on protected ecological sites by careful siting of the Order Limits to avoid direct impacts to designated sites and avoidance of direct impacts on key areas of sensitivity including Priority Habitats which may support protected species, wherever possible.

21.4 Desk Study Extent, Survey Areas and Data Sources

12. The desk study and survey areas adopted to describe the baseline for Onshore Ecology are set out in Table 21.3 below, which also sets out the sources of data used. Full descriptions of the methods used are presented in the relevant supporting Appendices.

13. Selection of the desk study extent and survey areas has been based upon best practice and in response to stakeholder feedback.

14. Figures showing the desk study and survey areas are presented as part of the supporting Appendices for each survey type.

Table 21.3 Desk Study and Survey Areas and Data Sources

Desk Study / Survey Types	Area and Data sources
Desk Study	▪ Designated sites data for up to 15km from Order Limits; ▪ Bat data from up to 5km from Order Limits; and ▪ Habitat and species data for up to 2km from the Order Limits. Data requested from the GLNP, and online searches. Full details are outlined in Appendix 21.1 Onshore Ecology Desk Study (Document Reference 6.3.21.1).
UK Habitat Classification survey	▪ Habitat assessment initially considered the Project's onshore boundary (as documented in the PEIR) plus a 100m buffer radius from it. ▪ As the design has progressed, the Project footprint and buffer zones have been reduced to the Order Limits, as described in Chapter 3 (Document Reference 6.1.3), plus a 100m buffer radius. Full details are outlined in Appendix 21.2: UK Habitat Classification Survey (Document Reference 6.3.21.2).
Important Hedgerow Survey	▪ All land within the Order Limits subject has been subject to search for hedgerows, with detailed assessment of potentially 'important' hedgerows. Full details are outlined in Appendix 21.3: Important Hedgerows Survey (Document Reference 6.3.21.3).

Desk Study / Survey Types	Area and Data sources
Invertebrates	▪ Invertebrates desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it. ▪ Invertebrates survey and assessment considered the Order Limits +100m, or +500m where habitat connectivity to known sites exists. Full details in Appendix 21.09: Invertebrate Study (Document Reference 6.3.21.10).
Fish study	▪ Fish desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it, this included GLNP and Environment Agency record searches. ▪ Fish habitat surveys within the Order Limits. Full details are outlined in Appendix 21.10: Fish Habitat Study (Document Reference 6.3.21.9).
Amphibians	▪ Amphibians desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it. ▪ HSI, eDNA for GCN of ponds considered the Project's Order Limits +250m, and all ditches within the Order Limits + 100m. Full details are outlined in Appendix 21.7: Great Crested Newt Surveys (Document Reference 6.3.21.7).
Reptiles	▪ Reptiles desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it. ▪ Habitat assessment for all land within the Order Limits +100m. Full details are outlined in Appendix 21.8: Reptile Habitat Suitability Study (Document Reference 6.3.21.8).
Bats	▪ Bat presence desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it. ▪ Bat roost records and development licences held on Magic map extended to 5km from the Order Limits. ▪ Field survey including Preliminary roost inspections (PRAs), presence/ absence, and manual and static activity surveys were undertaken in suitable habitats within the Order Limits (where access was granted). Full details are outlined in Appendix 21.4: Bat Surveys (Document Reference 6.3.21.4).

Desk Study / Survey Types	Area and Data sources
Badger surveys	▪ Badger desk study initially considered the Project's onshore boundary (as documented in the PEIR) plus a 2km buffer radius from it. ▪ Walkover of suitable habitat within the Order Limits +100m to search for and classify setts, and to record other evidence of badger activity. Full details are outlined in Appendix 21.5: Confidential Badger Desk Study and Field Survey (Document Reference 6.3.21.5).

21.5 Baseline Environment

21.5.1 Baseline Data

15. This section describes the present conditions which constitute the existing baseline environment for Onshore Ecology within the onshore study area.
16. The ecological baseline has been described based on data collated via the desk study and field surveys, as set out in Table 21.3 above, and draws on supporting Appendices, references to which are presented in the relevant sections.
17. To aid description and interpretation, the large area within the Order Limits has been divided into segments as set out in Table 21.4 below, and the location of ecological features is described in relation to these segments in the subsequent sections.

Table 21.4 Segment References

Segment Name
ECC 1: Landfall to A52 – Hogsthorpe
ECC 2: A52 – Hogsthorpe to Marsh Lane
ECC 3: Marsh Lane to A158 - Skegness Road
ECC 4: A158 – Skegness Road to Low Road
ECC 5: Low Road to Steeping River
ECC 6: Steeping River to Fodder Dike Bank/Fen Bank
ECC 7: Fodder Dike Bank/Fen Bank to Broadgate
ECC 8: Broadgate to Ings Drove
ECC 9: Ings Drove to Church End Lane
ECC 10: Church End Lane to The Haven
ECC 11: The Haven to Marsh Road
ECC 12: Marsh Road to Fosdyke Bridge
ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove
ECC 14: ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area

21.5.2 Important Ecological Features

18. Ecological features can be important for a variety of reasons and the rationale used to identify them is explained below. Importance may relate, for example, to protected status, the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such

habitats and/ or species are threatened throughout their range, or to their rate of decline.

19. Important habitats are considered to be those which:
    - Match descriptions of habitats listed on Annex 1 of the Habitats Directive, so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017 (as amended);
    - Comprise irreplaceable habitats, such as (but not limited to) sand dunes, and veteran trees;
    - Match descriptions for NERC Act 2006 Section 41 'Priority Habitats' and/or LBAP habitats; and/or
    - Comprise a significant habitat resource for an important species (see below).
20. Important species are considered here to be those:
    - Of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive) so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017 (as amended);
    - Specially protected under the terms of the Wildlife and Countryside Act 1981 (as amended);
    - Red listed or listed as near threatened using International Union for the Conservation of Nature (IUCN) criteria (IUCN, 2012; IUCN, 2016; IUCN, 2019), e.g., in one of the UK Species Status Project reviews, or where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book;
    - Which are listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a nationally notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/ or,
    - Endemic to a country of geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).
21. The CIEEM Guidelines state that the importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used to provide a valuation of importance for species and habitats comprising the baseline:
    - International;
    - UK;
    - National (i.e. England);
    - County (i.e. Lincolnshire); and
    - Local (i.e. within circa 5km of the Order Limits).
22. For the purposes of this assessment, only ecological features of Local importance or greater are referred to as IEFs and subject to a detailed assessment, although features under legal protection are also assessed. Whilst effects on other ecological features of lower importance cannot be ruled out by this assessment, they are considered unlikely to be significant in legal or policy terms so are not subject to detailed assessment. Scoping out detailed assessment of ecological features that are widespread, unthreatened and resilient to project impacts from EIA

is consistent with published good practice (CIEEM (2018) para. 4.1). Direct Project impacts upon biodiversity as a whole, including habitats of less than local value, are considered through the BNG process which is outlined within the BNG Report (Principles and Approach) (document 9.5).

23. This process provides measurable compensation and enhancement to mitigate the direct impacts to all habitats affected.

21.5.3 Protected Sites

21.5.3.1 Statutory Designated Sites

24. The results of the desk study are presented in Appendix 21.1: Onshore Ecology Desk Study (Document Reference 6.3.21.1), which provides details of designated sites within the Study Area. There are two SACs, 15 SSSIs (excluding geological designations), three NNRs and two LNR within the study area.

25. Table 21.5 below presents a summary of these sites, which are listed by the nearest segment and then by minimum distance from the Order Limits. Figure 21.1.1 illustrates the location of the statutory designated sites in relation to the Project. The SACs are considered to have **International** importance, the SSSIs and NNRs are of importance at the **UK** level, and the LNRs are considered to have **County** importance.

Table 21.5 Summary of Location and Interest of Designated Sites

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
Sea Bank Clay Pits SSSI	0	ECC 1: Landfall to A52 – Hogsthorpe	ENE	17	SSSI: 'A series of isolated flooded clay workings of varying size, depth and topography which now support uncommon aquatic plant community's characteristic of the slightly brackish, eutrophic (nutrient-rich) water in addition to extensive reedbeds and a rich marginal wetland flora. The pits are important for breeding, wintering and passage birds and support a rich aquatic invertebrate fauna, notably beetles, including several nationally scarce species and others new to the County. The water plant communities of the pits are characterised by fennel pondweed, lesser pondweed, horned pondweed, spiked water milfoil, algae of the genus Enteromorpha and two nationally scarce species: brackish water crowfoot and soft hornwort. Large colonies of common spotted orchid occur at Wolla Bank in marshy ground.'
Willoughby Branch Line LNR	4.9	ECC 1: Landfall to A52 – Hogsthorpe	W	5.00	'Formed of a disused branch railway, the track has developed into a fine wildlife area with ashwood, hawthorn scrub and grassland supporting a varied flora, including abundant bird's-foot trefoil and restharrow, hemp-agrimony, spotted-orchid, twayblade, lady's bedstraw, yellow-wort and great burnet. Butterflies include common blue and several species of skippers and browns. Whitethroat, lesser whitethroat, blackcap, sedge warbler, redpoll and other finch species, and occasionally nightingale, nest in the reserve. Hips and haws attract

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					fieldfares and redwings in winter, and barn owls frequently use the track for hunting.'
Saltfleetby-Theddlethorpe Dunes SSSI	12.5	ECC 1: Landfall to A52 – Hogsthorpe	NNW	972	'This nationally important site includes flats, dunes, salt, and freshwater marsh which together support an exceptionally rich flora and fauna. There are outstanding assemblages of vascular plants, invertebrates and breeding birds and it is the most north-easterly breeding site in Britain for the Natterjack Toad. The rapid accretion of dunes and saltmarsh make this an important site for research into the processes of coastal development. The intertidal sands and muds provide extensive feeding and roosting grounds for wildfowl and waders including brent geese, shelduck and dunlin. Yellow wagtails breed on the saltmarsh and there is a small colony of little tern on the shingle bank. Diverse and successional saltmarsh and rich fen communities, supporting a colony of orchids including southern and early marsh orchids (*Dactylorhiza praetermissa* and *D. incarnata*), pyramidal and bee orchids and rare plants such as needle spike rush (*Eleocharis acicularis*), divided sedge, marsh pea and greater water-parsnip. Invertebrates recorded include several notable moths and nationally rare species from the moth and beetle families. There are outstanding breeding densities of birds in the dune scrub, with whitethroat a major constituent. Also present are lesser whitethroat and long eared owl. The oldest areas of scrub now contain breeding blackcap (*Sylvia atricapilla*), garden warbler and nightingale.

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					Part of the site is also designated as Theddlethorpe Dunes and Gibraltar Point SAC.'
Lincolnshire Coronation Coast NNR	12.7	ECC 1: Landfall to A52 - Hogsthorpe	NNW	619	NNR: 'Site forms part of the Saltfleetby-Theddlethorpe Dunes SSSI, as well as part of the Humber Estuary SAC. It is an important reserve containing tidal sand and mudflats, salt and freshwater marshes and sand dunes. On the foreshore, accreting mud and silt flats and saltmarsh in the north give way to a narrower sandy beach at the southern end.'
Calceby Marsh SSSI	13.4	ECC 1: Landfall to A52 – Hogsthorpe	W	10.8	'Calceby Marsh is of national importance as an outstanding example of a base-rich marsh. This habitat type typically follows the distribution of calcareous springlines, and streams, in this case Calceby Beck, a Lincolnshire Wolds chalk stream. Such areas of base-rich marsh are becoming increasingly scarce in the county, as elsewhere in England, through the effects of drainage and other agricultural improvements. The site consists of 3 areas of marshland, each differing slightly in its species composition, surrounded by tussocky neutral grassland which is of value to breeding snipe and lapwing. The site is one of the few stations in the county, outside the Cambridgeshire Fens, where the marsh moth occurs.'
Swaby Valley SSSI	14.2	ECC 1: Landfall to A52 – Hogsthorpe	W	3.5	'A glacial overflow valley supporting two habitats now scarce in Lincolnshire - floristically diverse, lime-rich marsh and unimproved chalk turf. The marsh borders a stream bisecting the valley floor and the interest of the grassland is increased by the terraced nature of the slopes.

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					The wet conditions favour orchids and the marsh arrowgrass (*Triglochin palustris*). The sheltered conditions on the site attract 15 species of butterfly.'
Willoughby Meadow SSSI	5.5	ECC 2: A52 – Hogsthorpe to Marsh Lane	W	0.52	'This meadow is the best example of the permanent unimproved neutral grassland once common over Lincolnshire Middle Marsh boulder clay. Well over one hundred species have been recorded from its small acreage. Surrounded by hedgerows, this field is still managed by the traditional means of taking a hay crop followed by grazing. Two small ponds are located at the field's edge.'
Willoughby Wood SSSI	6.3	ECC 2: A52 – Hogsthorpe to Marsh Lane	W	23.4	'A representative of the series of ancient woodlands found on the middle Marsh Boulder Clay on the edge of the Lincolnshire Wolds. It is predominantly oak-ash and hazel, managed as coppice with standards. This supports a characteristic and rich ground flora. The site is notable for its breeding birds.'
Candlesby Hill SSSI	6.6	ECC 2: A52 – Hogsthorpe to Marsh Lane	WSW	1.81	'One of the best remnants of the once extensive chalk grasslands of the South-east Lincolnshire Wolds. Together with surrounding scrub and broad-leaved woodland, the site provides an excellent example of the sequence of change to a mature system.'
Hoplands Wood SSSI	6.6	ECC 2: A52 – Hogsthorpe to Marsh Lane	W	14.4	'Situated on the northern side of a shallow valley on the poorly draining boulder clay of the Lincolnshire Middle Marsh, Hoplands Wood is one of the best remaining examples of oak/ash ancient woodland in north Lincolnshire. It is characterised by a local abundance of alder and a mosaic of tree species perpetuated by a long

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					history of woodland management promoting both high forest and coppice-with-standards. This favours a rich and varied ground flora and breeding bird community.'
Skendleby Psalter Banks SSSI	8.4	ECC 2: A52 – Hogsthorpe to Marsh Lane	W	1.0	'The species-rich unimproved grasslands of Skendleby Psalter Banks represent one of the best examples of a habitat now rare and fragmented in Lincolnshire. The abundance of plants restricted to these steep north-facing slopes of a dry valley cut into the eastern Wolds by glacial meltwaters is maintained by traditional management of sheep grazing.'
Bratoft Meadows SSSI	2.8	ECC 4: A158 – Skegness Road to Low Road	W	2.2	SSSI: 'The best example of species rich neutral grassland in North Lincolnshire. One of the remaining areas of permanent grassland not dominated by plants associated with chalk and limestone. Two adjacent fields which border the Cowcroft drain are divided by a high hedge of hawthorn with fine specimens of pollarded crack willow. Both are managed as hay meadows and are grazed after cutting. They are dominated by sweet vernal grass, red fescue, meadow fescue and creeping bent, and a rich sward includes betony, dyer's greenweed, cowslip, adder's tongue fern and saw-wort. Wetter areas have cuckooflower and ragged robin. The southern field has abundant green-winged orchid. A third field separated from the others by a narrow strip of improved pasture is dominated by the same grasses as the other meadows and, like them includes yellow rattle, great burnet and devil's-bit scabious. It is cut for hay.

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					The site as a whole attracts large numbers of butterflies, and 18 species of terrestrial mollusc are recorded.'
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC	4.1	ECC 5: Low Road to Steeping River	ESE	968	'Important habitats include saltmarshes, salt pastures, salt steppes, coastal sand dunes, sand beaches, machair, bogs, marshes, water fringed vegetation and fens. Annex 1 habitats that are the primary reason for designation include: Fixed coastal dunes with herbaceous vegetation Dunes with sea buckthorn Humid dune slacks Embryonic shifting dunes (a qualifying features though not a primary reason for designation).'
Gibraltar Point SSSI	4.1	ECC 5: Low Road to Steeping River	ESE	581	SSSI: 'The SSSI is managed by the Lincolnshire and South Humberside Trust for Nature Conservation. Designated for its sand dunes, saltmarsh, freshwater marsh, and associated fauna. Invertebrates include Lepidoptera, Diptera and Coleoptera, including 12 species which are nationally rare. Breeding birds include mallard, shelduck, ringed plover, little tern, oystercatcher, and redshank. Passage and wintering birds of internationally important numbers include oystercatcher, grey plover, knot, sanderling and bar-tailed godwit and the area is of national importance for its numbers of little ringed plover.'
Gibraltar Point NNR	4.3	ECC 5: Low Road to Steeping River	ESE	429	'Site which forms a small part of Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC and SSSI. Habitats include sand dunes, saltmarsh, marshes, and meadows.'

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
Jenkins Carr SSSI	10.1	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	NW	3.6	'A species rich example of alder carr, a habitat now rare in the area, with stream and swamp communities of regional importance. Stands of alder, and mixed woodland dominated by willows *Salix* spp., but also has ash (*Fraxinus excelsior)* and alder. The area of open water/ swamp in the east and the stream sides have wetland species including water-plantain (*Alisma plantago-aquatica)*, wild celery and lesser water parsnip (*Berula erecta)*. In different areas along the stream bushgrass (*Calamagrostis epigejos)*, reedmace and reed sweet-grass (*Glyceria maxima)* dominate. The wet areas contain a variety of sedges with patches of hemp agrimony (*Eupatorium cannabinum)*, water figwort (*Scrophularia aquatica)* and wild iris (*Iris pseudacorus).'*
Keal Carr SSSI	10.7	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	NW	23	'An example of a base-rich spring-line alder woodland, especially characteristic of the southern Lincolnshire Wolds. The wood supports a rich flora typical of flushed ground and is one of the best sites in the county for the alternate-leaved golden saxifrage (*Chrysosplenium alternifolium)*. Woodlands dominated by alder are rather rare nationally, as many such stands have been lost through drainage. The bottom of the valley is a mosaic of tall herbs in open areas and woodland, with shaded marsh vegetation under the tree canopy. The woodland below the spring line is dominated by old, coppiced alder with some scattered coppiced ash and a shrub layer of willows Salix spp.

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					At the northern end of the site an area of open water provides additional interest as it is much used by duck. Keal Carr is a habitat for a number of breeding birds, including all three species of woodpecker, willow tit (*Poecile montanus*) and garden warbler. In winter the area is used as a feeding ground by siskin (*Spinus spinus*). Above the spring line, the steep dry sandy slopes have a similar mosaic of woodland and open areas, the latter dominated by bracken (*Pteridium aquilinum).'*
Mavis Enderby Valley SSSI	13.5	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	NW	15.4	'On the steeper sides species-rich unimproved grassland has been maintained by sheep grazing. The poorly-draining valley floor to the south has developed as a marsh alongside the beck. The dry acid grassland of the slopes is dominated by red fescue (*Fescue rubra*), common bent (*Agrostis capillaris*) and sweet vernal grass (*Anthoxanthum odoratum*). Typical herbs are mouse-ear hawkweed (*Hieracium pilosella*), tormentil (*Potentilla erecta*) and sheep's sorrel (*Rumex acetosella*) with the locally scarce meadow saxifrage (*Saxifraga granulate*) a feature. Where sandstone is exposed, species scarce in the East Midlands have colonized. This is the only known Lincolnshire site for *Racomitrium heterostichum* and *Lophocia ventricosa v ventricosa*. A whole series of badger setts is located both along the sandstone exposure and in the woods. Snipe breed and water rail visit this area.'

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
The Wash SSSI	0.2	ECC 11: The Haven to Marsh Road	E	62,044	SSSI: 'Covers the same area and footprint as the SPA and Ramsar. An area of international biological interest. The intertidal mudflats and saltmarshes represent one of Britain's most important winter-feeding areas for waders and wildfowl outside of the breeding season. Enormous numbers of migrant birds, of international significance, are dependent on the rich supply of invertebrate food. The saltmarsh and shingle communities are of considerable botanical interest and the mature saltmarsh is a valuable bird breeding zone. In addition, the Wash is also very important as a breeding ground for common seals.'
The Wash (and North Norfolk Coast) SAC	0.2	ECC 11: The Haven to Marsh Road	E	107,720	SAC: 'Important habitats include marine areas, sea inlets, tidal rivers, estuaries, mudflats, sand flats, lagoons (including saltwork basins), saltmarshes, salt pastures and salt steppes. Annex 1 habitat that are the primary reason for designation: sandbanks which are slightly covered by sea water all the time mudflats and sandflats not covered by seawater at low tide large shallow inlets and bays reefs Glasswort and other annuals colonising mud and sand Atlantic salt meadows Mediterranean and rutico-Atlantic halophilous scrubs (*Sarcocornetea ruticose)* Coastal lagoons (a qualifying features though not a primary reason for designation).

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					The SAC is also designated for Annex II species common seal, with otter also listed as a qualifying feature but not the primary reason for designation.'
The Wash NNR	0.6	ECC 12: Marsh Road to Fosdyke Bridge	ENE	8,777	NNR: 'Site of mixed of open deep water, permanent shallow water, mudflats and saltmarsh, representing one of Britain's most important winter-feeding areas for waders and wildfowl (Natural England via Lincolnshire's National Nature Reserves Webpage). It comprises Kirton Marsh, Terrington St Clement Marsh, Point Green, and the North Wootton Marsh. It's a valuable breeding zone for birds such as redshank and supports one of the largest common seal populations in England.'
Surfleet Lows SSSI	3.1	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	SW	3.8	'Surfleet Lows is one of the few remaining wet alluvial meadows in Lincolnshire which has not been subjected to agricultural improvement. Meadows of this type are now rare throughout lowland Britain. A typical range of meadow plants is present as well as a number of species more characteristic of coastal locations. The meadow occupies a hollow formed by an old coastal creek system and its residual high salinity explains the presence of brackish marsh plants. The grassland is dominated by marsh foxtail (*Alopecurus geniculatus)* and floating sweet-grass (*Glyceria fluitans)*, together with hammer sedge (*Carex hirta)*, tubular water-dropwort (*Oenanthe fistulosa)*, celery-leaved buttercup (*Ranunculus sceleratus)*, hairy buttercup (*R. sardous)*, strawberry clover, sea milkwort and other brackish and neutral grassland plants. Areas of marsh are characterised by common reed,

Site Name	Distance from the Order Limits (km)	Nearest Segment	Compass Direction	Area of Designation (ha)	Description
					false fox-sedge, sea club-rush, common spike-rush (*Eleocharis palustris)*, distant sedge and grey clubrush (*Schoenoplectus tabernaemontani)*. Additional interest is provided by wet fen woodland, pools, and tall fen vegetation. Winter flooding of the meadow attracts ducks such as mallard, teal (*Anas crecca*) and wigeon (*Anas penelope*), and good numbers of snipe. Reedwarblers breed here, and at least 50 other species of bird have been recorded.'
Vernatts Drain LNR	5.1	ECC 14: Surfleet Marsh OnSS / Marsh Drove to Connection Area	SW	1.68	Wildflower meadow and wetland habitats including reedbeds, marsh and a large pond. Provides habitat for damselflies, small copper butterfly, reed warbler and water vole.

21.5.3.2 Non-statutory Designated Sites

26. The desk study returned a total of 43 Local Wildlife Sites (LWS) and eight Lincolnshire Wildlife Trust (LWT) Reserves within the Study Area, of which 12 and 5 of the sites respectively, are located, at least partially, within the Order Limits.
27. Table 21.6 provides summary details for those sites within the Order Limits, along with their distance from the nearest segment of the Order Limits.
28. Figure 21.1.2 of Appendix 21.1: Onshore Ecology Desk Study (document reference 6.3.21.1) illustrates the location of the designated sites in relation to the Project.

The non-statutory designated sites are considered to have **County** importance.

Table 21.6 Non-statutory Sites within the Study Area

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
Local Wildlife Sites					
Anderby Creek Sand Dunes	0	ECC 1: Landfall to A52 – Hogsthorpe	NE	11.9ha	Main Habitats: Coarse or rank grassland, sand dune, scrub and ditch. 'A 1.1km long stretch of coast on the seaward side of Anderby Marsh and Wolla Bank Reedbed nature reserves. Due to lack of management, most places support coarse and weedy vegetation, with substantial cover of scrub and trees. Good, open dune is very limited in extent.'
Hogsthorpe Pit	0	ECC 1: Landfall to A52 – Hogsthorpe	SSW	1.4ha	Main Habitat: Standing water, willow carr, grassland 'Around the pond is diverse wetland vegetation and some drier grassland and scrub. Lesser bulrush and common reed are abundant at the water's edge. Also present are water dock, branched bur-reed, water mint, purple loosestrife, greater pond-sedge, and yellow iris. Marshy areas, particularly to the east of the pond, support further species, such as marsh bedstraw, hoary willowherb, tufted forget-me-not, water-cress, meadowsweet and jointed rush. Of most note is a sizeable patch of brookweed amongst tall fen vegetation beside an angler's path. Mature and younger specimens of various willows dominate the remainder of the site, with a restricted range of common ground flora plants beneath. Some sycamore is also present. Botanically-rich grassland is restricted to small areas of dry bank on the southern and northern margins of the pond. Species present include autumn hawkbit, tufted vetch, yarrow, lady's bedstraw and meadow vetchling. A larger patch of coarser grassland is used as a car park (in the north-west corner of the site). This supports much

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					common knapweed, together with bird's-foot-trefoil, common sorrel, red clover, red fescue, tall fescue and tufted hair-grass. Adjacent to this is neglected former grassland that is now dominated by species such as field bindweed, creeping thistle, bramble, cow parsley, upright hedge-parsley (*Torilis arvensis*), field horsetail and false oat-grass. Scrub species include hawthorn, elder, blackthorn and some dogwood that appears to be non-native. Coot, moorhen, and common dragonflies were recorded.'
Marsh Yard to Anderby Creek Dunes	0.2	ECC 1: Landfall to A52 – Hogsthorpe	N	16.8ha	Main Habitat: coarse or rank grassland, scrub – scattered/ dense (also semi-improved, neutral grassland, non-native plantation, reedbed) 'A 1.75km stretch of coast comprising bare sand on the upper beach with some young dunes; a line of low, fixed dunes supporting much coarse grassland, which widens in the south and supports plentiful woody vegetation, including garden escapes; and a range of habitats inland of the dunes, particularly planted and naturally occurring trees and scrub on both dry and damp land, grassland, sparsely vegetated car parking areas, a track and a little bare sand. To the north is a huge population of scarce strawberry clover along the car park and species rich neutral grassland. Many parts of the dune ridge are dominated by coarse vegetation, such as marram, lyme-grass, sea and sand couch, common reed, and dewberry. A wide range of woody species includes sycamore, horse chestnut, white poplar, hybrid black poplar, pine, ash, buckthorn, sea-buckthorn, buddleia, wild & garden privet, elder, hawthorn and ivy. Damp areas, particularly inland in the north, support osier, grey

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					sallow, woody nightshade, comfrey, amphibious bistort, and silverweed. Birds and invertebrates seen during the survey included migrating whimbrel, reed bunting, house martin, common blue, brown argus, meadow brown, gatekeeper, peacock, and common darter.'
Wolla Bank South	0.2	ECC 1: Landfall to A52 – Hogsthorpe	E	5ha	Main Habitat: Coarse or rank grassland, semi-improved, neutral grassland, reedbed (also drain and pond). 'Coastline comprising bare sand on the upper beach; a line of low fixed dunes grading into wetland; and an old embankment beside the road. As a result of recent landscaping works, much of the site is now far wetter than previously, with substantial areas of open water and reedbed, as well as coarse grassland in the central island and on the embankment. The wetland and dunes support a rich flora and fauna. A wide range of birds and invertebrates were noted during the survey, including coot, sedge & reed warbler, swift, common whitethroat, common blue, ringlet, small skipper, shaded broad-bar, common blue & blue-tailed damselfly, darter, and four-spotted chaser.'
Anderby Gravity Outfall	0.3	ECC 1: Landfall to A52 – Hogsthorpe	N	0.6ha	Main Habitats: Drain, semi-improved neutral and coarse grassland 'The canalised downstream end of Main Drain and its steep banks on the southern edge of Anderby Creek. Adjacent to both Anderby Creek Sand Dunes and Anderby Marsh LWT nature reserve. The drain is maintained, limiting the brackish floral community present. Sea club-rush and common reed are abundant on both of the steep lower banks, as is typical of brackish drains. Few aquatic species can survive the saline conditions, but any that do are kept under control by regular management. The very steep banks prevented

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					comprehensive study of water plants, but at the more accessible landward end there is much fennel pondweed and some bulrush. Good assemblage of birds (reed and sedge warbler, common whitethroat, wren, swallow, swift, house martin), damselflies and common frog.'
Chapel Six Marshes	0.5	ECC 1: Landfall to A52 – Hogsthorpe	ESE	0.75km	Main Habitats: Coarse or rank grassland, lake, reedbed, scrub - scattered/dense (also ditch, marsh/fen, non-native plantation - on ancient/new, pond, scrub - scattered/dense) A 750m stretch of coast and is partly a LWT Reserve. 'Within the small area of reserve managed by LWT, wetland plants typical of brackish water include parsley water-dropwort, sea-milkwort, probable brackish water-crowfoot, saltmarsh rush and distant sedge. Growing with these are ivy-leaved duckweed, common fleabane, angelica, creeping bent, toad rush and false fox-sedge. On the dune ridge and adjacent landward slope are sand sedge, sand couch, red fescue, marram, lyme-grass, common bird's-foot-trefoil, meadow vetchling, cat's-ear, tufted vetch, black medick, and dewberry. Trees and shrubs include grey sallow, sycamore, hawthorn, elder, sea-buckthorn, bramble, dog-rose. The remainder of the site is managed by LCC and is publicly accessible. Major works have been carried out in 2014/2015 to enhance the value of the site for wetland flora and fauna, involving creation of winding water channels on land to north and south of the entrance road. Habitats present over the site as a whole are bare sand and short vegetation in car parking areas, coarse grassland, a little open water, much reedbed, and varying cover of trees and scrub. The resulting flora is diverse and interesting.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					Fauna recorded includes moorhen, migrating whimbrel, wood pigeon, green-veined white, small tortoiseshell, and common darter.'
Chapel Pit Nature Reserve (non-SSSI)	0.9	ECC 1: Landfall to A52 – Hogsthorpe	ESE	0.3ha	Main Habitats: Scrub, rough grassland, ditch, and hedgerow. 'This site comprises two small unmanaged parts of Chapel Pit nature reserve, all the rest of which is part of Sea Bank Clay Pits Site of Special Scientific Interest. The smaller element is a very small spur of land in the south-eastern corner of the reserve, supporting much scrub and a little remnant grassland. The remainder of the site lies on the northern edge of the reserve, immediately adjacent to an east-west orientated track within the SSSI. In the west there is a triangular area of rough grassland and scrub. East of this is a ditch and overgrown hedgerow.'
Chapel Pit	0.9	ECC 1: Landfall to A52 – Hogsthorpe	ESE	3ha	Main Habitat: Open water and reedbeds. 'Excavated for clay for the repair of the sea banks following the floods of 1953, the flooded pit has marginal reedbeds and aquatic plants, such as water-crowfoot and great reedmace. Fifteen species of duck have been recorded, mainly winter visitors. Bearded tit and bittern are recorded occasionally. In summer breeding species include reed and sedge warblers, lesser whitethroat and little grebes can also be seen. In August and September thousands of migrating swallows and house martins roost in the reedbeds. Screens of willows round the banks of the pits have been planted in order to reduce disturbance to birds. A 0.3ha area of this LWT is also designated as Chapel Pit LWS.'
Chapel Point Dunes, North	1.3	ECC 1: Landfall to	SE	3.4ha	Main Habitats: Coarse or rank grassland, sand dune, scrub – scattered/ dense.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
		A52 – Hogsthorpe			'A 0.62km stretch of coastline. In the east is the upper part of a shallow sloping sandy beach, which is within Chapel Point to Wolla Bank geological Site of Special Scientific Interest. Elsewhere, in central and southern parts, there are heavily scrubbed-up fixed dunes, which also support some coarse grassland. Plants of good quality dunes are few in number, but include marram, lyme-grass, sea and sand couch, hound's-tongue, sea bindweed, prickly saltwort and sand sedge. Invertebrates recorded include common blue, ruddy darter and common darter.'
Moggs Eye Sea Bank Ponds	1.6	ECC 1: Landfall to A52 – Hogsthorpe	N	2.9ha	Main Habitat: Standing water, reedbed. 'A long, thin area of standing water, possibly formed by excavation of the earth sea wall. To the north, the site is almost 100% common reed with the road embankment supporting wooded patches of crack willow, alder and sycamore. Few aquatic species noted, although some wet edges support sea club-rush, mare's-tail, common duckweed, least duckweed and the invasive non-native New Zealand pigmyweed. The southern end of the site is used by anglers. Marshy edges of the site are botanically diverse. Species present include brookweed, saltmarsh and jointed rushes, clustered dock, hoary willowherb and false fox-sedge. The slightly drier conditions nearby provided a chance sighting of adder's-tongue, a fern that is usually very inconspicuous in late summer. Other grassland species include crested dog's-tail, red fescue, common bent, meadow buttercup, meadow vetchling and lesser hawkbit.'
Chapel Point Dunes, South	1.9	ECC 1: Landfall to	SE	7.7ha	Main Habitat: Sand dune

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
		A52 – Hogsthorpe			'A north-south aligned strip of coastal land, 1.6km long and varying in width between 25m and 75m. The site comprises developing low sand dunes on the upper beach, between un-vegetated sand to the east and the concrete promenade in the west. The generally sparse sward includes a diverse sand dune flora. Much of the area is characterised by a mixture of bare sand and marram, but few other plants. However, both sea-holly and sea spurge are not uncommon in this habitat in the north. Places that are better vegetated support short species associated with open, sandy grassland, such as thyme-leaved sandwort, common whitlowgrass, little mouse-ear, lesser chickweed, wall speedwell, early forget-me-not, smooth meadow-grass, and sand sedge. Other more robust species include lyme-grass, sea couch, common reed, hound's-tongue, evening-primrose, great mullein, great lettuce, horse-radish, and hogweed. Amongst the birds and invertebrates encountered during the survey were swallow, house martin, dunnock (*Prunella modularis*), goldfinch, cinnabar, brown-tail moth, orange tip, and most notably several green hairstreaks.'
Huttoft Carr Terrace to Marsh Yard Dunes	1.9	ECC 1: Landfall to A52 – Hogsthorpe	N	10.4ha	Main Habitat: Coarse or rank grassland, sand dune, scrub – scattered/dense (also native plantation) 'A 1.2km stretch of coast comprising bare sand on the upper beach with some botanically-poor foredunes; a concrete pathway and linear car parking area at the top of the beach; a line of low, fixed dunes and flatter ground inland, supporting much unmanaged vegetation, dominated by dense scrub and trees in central and northern parts, with larger amounts of grassland further south; and

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					a gravel car parking area inland of the dunes at the southern end of the site, characterised by a short, open sward. Woody vegetation on the fixed dunes includes pine, sycamore, sea-buckthorn, elder, hawthorn, woody nightshade, bramble, and dewberry. Other robust or weedy plants here are marram, lyme-grass, common reed, sea couch, false oat-grass, creeping & spear thistle, hedge & large bindweed, curled dock and amphibious bistort. Species found in less vegetated sandy areas include prickly saltwort, sand couch, hound's-tongue, procumbent pearlwort (*Sagina procumbens*), sea fern-grass and sand sedge. The most interesting flora is typical of neutral soils. It is largely restricted to the vicinity of the southern car park and along a track that extends northwards. Present here are hare's-foot & strawberry clover, lesser & hop trefoil, buck's-horn plantain, common bird's-foot-trefoil, tufted vetch, meadow vetchling, yarrow, smooth hawk's-beard, autumn hawkbit, cat's-ear, black medick, silverweed, and smooth meadow-grass. Damper habitat west of the car park supports dense willow scrub, while further north of that there is much common reed. Birds, butterflies, and moths seen during the survey included common whitethroat, reed bunting, swallow, Sandwich tern, Essex skipper, painted lady, red admiral, and cinnabar.'
Sloothby Low Lane	0.8	ECC 2: A52 – Hogsthorpe to Marsh Lane	WNW	4.6km	Main Habitat: Neutral grassland (also damp grassland, standing water, seasonally wet areas, undulating ground, deep ditches, species-poor hedgerows) 'This wide green lane is an area of neutral grassland occasionally grazed by cattle. Good flora occurs in small patches, particularly at

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					the edges of the site. Occasional species present include yarrow, common knapweed, sorrel, cowslip, selfheal (*Prunella vulgaris)*, meadow buttercup, and strawberry clover. The dominant grasses over the majority of the site are cocksfoot (*Dactylis glomerata)* and perennial ryegrass (*Lolium perenne)* with areas of crested dogs-tail, meadow fescue, Timothy grass (*Phleum pratense)* and smooth meadow-grass. Damper areas are poached by cattle; the hollows are filled with water. These areas support scattered hard rush (*Juncus inflexus)*, water crowfoot and water starwort. Creeping bent is frequent in these areas. The site appears to be good for grassland fungi; species recorded include parrot waxcap (*Riparia riparia*), dung roundhead (*Stropharia semiglobata)*, field mushroom (*Agaricus campestris)*, *Hygrocybe virginea*, *Panaeolus sphinctrinus*, *Volvariella murinella* and *Vascellum pratense*. The slime mould *Mucilago crustacean* has also been recorded. The deep bordering ditches appear to be permanently wet and support a few species of note including abundant water horsetail (*Equisetum fluviatile)* and common spike-rush. Spiked water milfoil, broad-leaded pondweed (*Potamogeton natans)*, greater pond-sedge (*Carex riparia*) and water starwort are frequent. Water plantain and jointed rush occur scattered around the site. The dominant subaquatic species appears to be opposite-leaved pondweed (*Groenlandia densa).* Common reed is beginning to establish. Marestail is rare - one small patch being present in the northern ditch around TF 156 709. The steep banks support many of the meadow

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					species including locally abundant cowslips plus scrub/ruderal species such as bramble and great willowherb. The bordering hedges are mainly of hawthorn with bramble and field rose (*Rosa arvensis*). Elder and wild plum (*Prunus domestica)* are occasional. Crack willow is rare (two trees). Evidence of badgers noted and short-eared owl (*Asio flammeus*) observed. An owl box has been constructed at the end of the central branch of the site. Other species include Brown hare (*Lepus europaeus*), roe deer (*Capreolus capreolus*), redwing, moorhen, mute swan, wood pigeon, heron, magpie (*Pica pica*), pheasant (*Phasianus colchicus*), long-tailed tit (*Aegithalos caudatus*), blackbird (*Turdus merula*), skylark, carrion crow (*Corvus corone*), linnet (*Linaria cannabina*) and small tortoiseshell.'
Middlemarsh Farm	0.3	ECC 4: A158 – Skegness Road to Low Road	ESE	73.5ha	Main Habitat: Grazing marsh, standing water 'Around 7 fields surrounded by ditches and some hedges. In the mid-2000s, the area was transformed from arable land into a topographically-varied wetland where breeding, passage and wintering birds typical of the Lincolnshire coastal grazing marshes could flourish. Aquatic and waterside plants of great interest have arrived naturally, while a neutral grassland sward has been established through sowing of appropriate native grasses, plus small amounts of cowslip, ragged-robin, and other meadow species. Cattle graze throughout at low intensity for much of the year. The list of breeding birds since 2008 includes lapwing, redshank, snipe, avocet (*Recurvirostra avosetta*), yellow wagtail, reed and sedge warbler, reed bunting, skylark (*Alauda arvensis*), shoveler

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					(*Anas clypeata*), mallard and mute swan (*Cygnus olor*). Wigeon, lapwing, curlew and other birds use the area in winter. Amongst the wetland plants present are horned pondweed, water-crowfoot, pink water-speedwell (*Veronica catenate*), branched bur-reed, common reed, and saltmarsh rush, plus the scarce orange foxtail (*Alopecurus aequalis*).'
Middlemarsh Meadows	0.5	ECC 4: A158 – Skegness Road to Low Road;	E	4.7ha	Main Habitat: Unimproved neutral grassland, coarse grassland (also semi-improved neutral grassland, hedgerows, drain) 'Four contiguous hay meadows, each one adjacent to the north-eastern edge of Middlemarsh Farm LWS. The two eastern fields are very rich in plants typical of high-quality neutral grassland, whereas the sward in the two western fields is less rich. Boundary ditches, hedges, scrub, and a farm track are included, because they are not cut for hay and support some extra plants and good invertebrate habitat. It is not known if there is any aftermath grazing. The southern boundary of the western field holds a lot of mature shrubs that vaguely enclose a narrow strip of un-managed, coarse grassland and wetter vegetation. Growing here are hawthorn, blackthorn, dog-rose, bramble, yellow iris, tufted hair-grass, reed canary-grass and common reed. Fauna noted during survey were sedge and reed warbler, chaffinch (*Fringilla coelebs*), wren, blue tit (*Cyanistes caeruleus*), starling, wood pigeon, small copper (*Lycaena phlaeas*), meadow brown, common blue and common frog.'
The Hollies Field	2.2	ECC 4: A158 – Skegness	NW	8.4ha	Main Habitat: Neutral Grassland 'Two fields with fossilised ridge and furrow and old drainage systems, bisected by a public footpath. The site is grazed by cattle.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
		Road to Low Road			The site supports some interesting plant species however they are generally restricted to the steeper slopes of the earthworks. The sward is dominated by crested dog's-tail *Cynosurus cristatus*, sweet vernal grass *Anthoxanthum odoratum* and Yorkshire fog *Holcus lanatus*. Meadow brome *Bromus commutatus*, timothy *Phleum pratense* and smooth meadow-grass *Poa pratensis* are occasional. Clumps of spear thistle *Cirsium vulgare* and creeping thistle *Cirsium arvense* are frequent throughout. In the very restricted areas where forbs are frequent species include yarrow *Achillea millefolium*, daisy *Bellis perennis*, rough hawkbit *Leontodon hispidus*, birds-foot trefoil *Lotus corniculatus*, creeping cinquefoil *Potentilla repens*, bulbous buttercup *Ranunculus bulbosa*, sorrel *Rumex acetosa* and meadow saxifrage *Saxifraga granulata*. The grassland flora of the site would benefit from management as an unfertilized hay meadow with aftermath grazing. Several occasionally drying pools across the site are dominated by floating sweet grass *Glyceria fluitans* with soft rush *Juncus effusus*, creeping buttercup *Ranunculus repens* and brooklime *Veronica beccabunga*. Larvae of great crested newt *Triturus cristatus* were recorded from these pools during the survey. A local resident reported that great crested newts are locally abundant. Other incidental records of fauna from the site include jackdaw *Corvus monedula* and rabbit *Oryctolagus cuniculus.'*
Steeping Marsh	2.7	ECC 5: Low Road to Steeping River	ESE	22.1ha	Main Habitat: Coarse or rank grassland, saltmarsh, river, drain, ditch (also scrub, saline lagoon, reedbed, ruderal) 'This is a 70-190m wide and 1.5km long 'island' of several interesting habitats surrounded by low-lying arable land.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					Growing on the riverbanks are typical saltmarsh plants such as spear-leaved orache (*Atriplex prostrata*), sea club-rush, reed canary-grass, sea couch and common cord-grass (*Spartina anglica*). Flatter areas nearby hold both temporary and permanent saline pools amongst saltmarsh. These salt-rich habitats support sea plantain, sea-purslane, sea aster (*Aster tripolium*), sea milkwort, sea arrowgrass, annual sea-blite (*Suaeda maritima*), greater sea-spurrey (*Spergularia media*), common scurvygrass (*Cochlearia officinalis*), glasswort and toad rush. One area of disturbed ground is favoured by grass-leaved orache. The Relief Channel is at least 30m wide. There is a varied selection of freshwater species along the margins, including common reed, angelica, marsh bedstraw, meadowsweet, yellow iris, amphibious bistort, bulrush, branched bur-reed, and false fox-sedge. Some saltiness is indicated by the presence of sea club-rush, while the few bankside trees and shrubs include grey and crack willow. Woody species present are hawthorn, sea buckthorn, wild privet and elder, with some sycamore further north. The boundary drain flora includes common reed, reed sweet-grass, angelica, water mint, common fleabane, and common duckweed. Amongst the grassland species on the adjacent embankment are meadow vetchling, tufted vetch, smooth hawk's-beard, yarrow, common mouse-ear, upright hedge-parsley, and red fescue.'
The Lymm	1.2	ECC 5: Low Road to Steeping River	WNW	3.2km	Main Habitat: River and linear reedbed (also coarse grassland, semi-improved neutral grassland, and scattered scrub). 'Botanical diversity varies along areas of the Lymn with many aquatic plants recorded such as five pondweed species, yellow water-lily, ivy-

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					leaved duckweed, water starwort and rigid hornwort. Wetland species also include common reed, reed canary-grass, reed sweet-grass and water dock whilst the flat road.'
Wrangle Brick Pits	0.3	ECC 7: Fodder Dike Bank/Fen Bank to Broadgate	SSW	15.1ha	Main Habitat: New native plantation, semi-improved neutral grassland, pit (also scrub, coarse or rank grassland, ditch and reedbed). 'A mosaic of waterbodies, grassland, semi-mature planted trees, broad-leaved woodland, cattle-grazed semi-improved grassland, and broad-leaved plantation woodland. The two main pits are used for fishing, but the north-eastern pond has been created for wildlife. The site is managed for nature conservation by the owner. The citation states that water vole feeding signs and latrines found around the margins of the southern pond.'
Hobhole Drain, Simmon House Bridge to Benington Bridge	1.4	ECC 8: Broadgate to Ings Drove	W	2.8km	Main Habitat: Drain, coarse grassland 'The channel is approximately 15m wide. No submerged or floating aquatic species were found. The southern stretch has much more emergent marginal vegetation than the north, although there are large patches of common reed near the pumping station in the north. The more diverse community of marshy species recorded at the edges of the drain towards the south included gypsywort (*Lycopus europaeus*), common fleabane, water mint, wild angelica and marsh woundwort in addition to the ubiquitous common reed, reed canary-grass and reed sweet-grass. The bridges along the drain have numerous species growing on them, particularly in the south. Species include black spleenwort (*Asplenium adiantum-nigrum*), maidenhair spleenwort (*Asplenium*

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					trichomanes), hart's-tongue (*Asplenium scolopendrium*), and smooth meadow-grass. Large trees have been planted almost all the way along the drain on the eastern side.'
Dove's Lane Drain	0	ECC 9: Ings Drove to Church End Lane	SSE	0.6km	Main Habitat: Drain 'Drain with the nationally scarce marsh-mallow.'
Shore Road Drain	0.1	ECC 9: Ings Drove to Church End Lane	SSE	0.6km	Main Habitat: Drain with grassland 'Drain with the nationally scarce marsh-mallow (*Althaea officinalis*).'
Hobhole Drain, Benington Bridge to Baker's Bridge	0.2	ECC 9: Ings Drove to Church End Lane	NNW	4.6km	Main Habitats: Scrub, semi-improved neutral grassland, coarse or rank grassland, and drain. 'The LWS provides a valuable corridor for wildlife due to the near continuous lining of scrub and trees along the banksides which provides important areas for local and migrant bird populations. The site also has high potential to support water vole and kingfisher. Scrub vegetation predominantly consists of elder, hawthorn, blackthorn, sycamore, bramble and dog-rose. Bankside flora is dominated by rough grassland with species including creeping buttercup (*Ranunculus repens*), common reed, lesser pond sedge (*Carex acutiformis*), great willowherb (Epilobium hirsutum), angelica, black knapweed (*Centaurea nigra*), vetch species, fleabane, hemlock (*Conium maculatum*), hogweed, cleavers (*Galium aparine*), bristly ox-tongue (*Helminthotheca echioides*), cow parsley and nettle with patches of lower sward species rich areas with red clover, bird's foot

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					trefoil, fleabane, ox-eye daisy (*Leucanthemum vulgare*), glaucous sedge, (*Carex flacca*), tare species (*Vicia sativa*), meadow vetchling, wild carrot (*Daucus carota*), common mouse-ear (*Cerastium fontanum*), and lady's bedstraw.'
Hobhole Bank	0	ECC 10: Church End Lane to The Haven	SSW	3.7ha	Main Habitat: Scrub, semi-improved neutral grassland, semi-improved calcareous grassland (also coarse or rank grassland). 'Man made, raised earth bank associated with a large drain (Hobhole Drain). The dominant communities on the bank top are rough neutral grassland, with areas of finer more calcareous grassland also present; and also dense scrub along the banksides. The calcareous nature of the grassland is likely to have arisen as a result of material brought in to form the banks. The site is a Lincolnshire Wildlife Trust Reserve and is actively managed in order to try and maintain the finer grassland sward on the bank top. Scrub invasion from the bank slopes is a threat to the floristic diversity of this site. It supports a good bird assemblage and is known locally for the long-eared owls which over winter on site.
Hobhole Drain, Baker's Bridge South	0	ECC 10: Church End Lane to The Haven	N	6.1km	Main Habitat: Scrub, semi-improved neutral grassland, semi-improved calcareous grassland, coarse or rank grassland, ditch. 'A man-made drain providing the main drainage for the East Fen north of Boston and discharging into The Haven. The eastern bank comprises neutral rough grassland and calcareous grassland (which is particularly species rich towards the southern end) – the bank is kept clear to assist dredging operations. The western bank supports more dense and scattered scrub – hawthorn, ash, blackthorn, willow species, elder, bramble, dog-rose, field maple and oak occur.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					The bankside flora is good whilst the aquatic habitat is relatively poor in comparison. Past surveys indicate that this has always been the case and the bankside flora has always been the notable feature of this site. The calcareous nature of the vegetation is likely to have arisen as a result of material imported when the banks were created. The site provides a valuable wildlife corridor due to the near continuous line of scrub and trees on the banksides.'
Havenside	0	ECC 11: The Haven to Marsh Road	W	33.1ha	Main Habitat: Coarse or rank grassland (also new-native plantation, scrub, semi-improved neutral grassland, improved grassland, ditch, pond, coastal grazing marsh, marsh, reedbed). 'A long man-made sea bank dating from 1880s. The component areas are: A raised bank of plantation and meadow at the western end Triangular area of rough grassland and newly planted trees Grazed grassland with drainage ditches and ponds Older sea bank with dense scrub An amenity area centred on the Pilgrim Fathers memorial with amenity grassland, two small ponds and wet grassland. The mosaic of woodland, grassland and wetland is very valuable in the local context and of significant value to local bird, mammal, and invertebrate populations. The linear nature of the site provides a good wildlife corridor through Boston.'
Frampton Hall	0	ECC 11: The Haven to Marsh Road	WNW	21.3ha	Main Habitat: Parkland (including a mosaic of semi-natural woodland, scrub, semi-improved neutral grassland, semi-improved calcareous grassland, improved grassland, coarse or rank grassland, ditch, pond)

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					'Veteran trees are abundant and include horse chestnut, pedunculate oak and walnut (*Juglans regia*). Some mature exotic species as well. The ponds are generally very shaded with rigid hornwort (*Ceratophyllum demersum*), reed sweet grass, common reed, yellow iris, algae, common duckweed, false fox sedge and bittersweet. The ditches are dry/seasonally wet and have fool's watercress (*Helosciadium nodiflorum*), celery leaved buttercup, floating sweet grass (*Glyceria fluitans*), creeping bent, watercress, reed sweet grass, reed canary grass (*Phalaris arundinacea*), common reed and creeping bent. The site is likely to be a valuable foraging/roosting area for local bat populations. The abundant mature/veteran parkland trees with holes, cracks and fissures have a very high bat roost potential. The mature parkland trees are one of the most significant features of this site.'
Slippery Gowt Sea Bank	1.3	ECC 11: The Haven to Marsh Road	N	1.2ha	Main Habitat: Coarse or rank grassland (also semi-improved neutral grassland, scattered scrub) 'A rough grassland bank, landside only, adjacent to the Haven and associated tracts of saltmarsh. The site mainly comprises a rough grassland bank between the bank top and footpath and the drain which occurs between the waste site and the bank. The area supports Boston horsetail (*Equisetum ramosissimum*) which occurs (or has occurred in the past) all the way along the landward bank, including the area that was stripped in 2006-07. This is the only site for this species in Greater Lincolnshire.'

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
Hall Weir	1.5	ECC 11: The Haven to Marsh Road	W	2.3ha	Main Habitat: Wet Woodland 'A mosaic of wet woodland, marshy areas, ponds, drains, and patchy wet/neutral grassland. It was possibly the site of former brick pits but has regenerated to secondary wet woodland in the main. There is no management and as a result there is abundant fallen dead wood, shading over the ponds, fallen trees in the ponds and wet areas and some very dense scrub. **Scrub and trees**: Dominated by willow species and alder with some poplar, elm, birch, snowberry, horse chestnut, elder, hawthorn. Much fallen and standing dead wood. **Ponds and wet flushes**: Dominated by yellow iris, gyspywort, water mint, reed canary grass, bittersweet, reed sweet grass, pond sedge, pendulous sedge, meadowsweet, water plantation, pendulous sedge and common reed. There are areas of the ponds, drains and wetlands in the interior of the site that are very shaded, therefore little emergent/fringing aquatic vegetation occurs. **Drains**: wet drain running to the south of the site supports brooklime, pink water speedwell, water starwort, fool's water cress, watercress, common duckweed. **Wet grassland and rough grassland**: dominated by creeping buttercup, rush species, great willowherb, silverweed, hogweed, false oat grass, common nettle, hedge bindweed, creeping thistle, Yorkshire fog, cow parsley, hedge woundwort and dock species. Water vole signs recorded in the wet drain running along the south side of the site. Signs of badger activity located towards the northern area of the site. The site is likely to be a valuable foraging area for

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					local bat populations, and it has high potential to support a rich invertebrate assemblage. The presence of hard fern is locally notable.'
Tytton Lane West Pits, East	1.5	ECC 11: The Haven to Marsh Road	NW	0.3ha	Main Habitat: Pit 'Deep water with steep banks in places, surrounded in the main by scrub and trees. The bankside is open and fringing/marginal vegetation is recorded in the areas which border gardens and also in areas along the southern boundary. The fringing vegetation comprises mainly common reed, reed sweet grass and yellow iris. Some water lily and marginal species occur near the gardens where the banks are not shaded.'
Tytton Lane West Pits, West	1.6	ECC 11: The Haven to Marsh Road	NW	0.6ha	Main Habitat: Pit 'Deep water with steep banks in places, surrounded in the main by scrub and trees. The bankside is open and fringing/marginal vegetation is recorded in the areas which border gardens and also in areas along the southern boundary. The fringing vegetation comprises mainly common reed, reed sweet grass and yellow iris. Some water lily and marginal species occur near the gardens where the banks are not shaded.'
Westgate Wood and Meadow	1.7	ECC 11: The Haven to Marsh Road	NW	31.4ha	Main Habitat: Native plantation – new, Neutral grassland – semi-improved 'Newly created woodland plantation on former arable land; this has been extended over the last few years to include grassland areas, parkland areas, ponds and more woodland. The site is developing into a good mosaic habitat with woodland of varying ages, some young parkland, water bodies and permanent grassland.'

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
Botolphs Park Pond	1.7	ECC 11: The Haven to Marsh Road	NW	1.1ha	Main Habitat: Pond, Garden 'Large pond, former brick pit, forming part of a large garden. Some non-native species present. A large garden pond with a sinuous form; there is a great variety of marginal habitats present including dense stands of common reed and bulrush, areas of rip rap with rush species growing, muddy margins with lower growing macrophytes such as watercress, water forget me not and blue water speedwell and small shallow inlets with some water starwort and common duckweed. The aquatic flora is relatively poor probably due to an abundance of water lilies covering the surface of the pond (particularly at the western end). Areas of the pond are becoming covered in invasive water lilies and there are some exotic species present. The water lilies have spread since the last survey visit. There are some banksides trees and scrub including willow species, hawthorn and exotic species. The banksides comprise amenity grassland with typical garden species. There is a small fountain within the pond.'
Moulton Marsh	0.3	ECC 12: Marsh Road to Fosdyke Bridge	SSE	28.3ha	Main Habitat: native plantation, reedbed, saltmarsh, saline lagoon (also coarse grassland, drain) An area of dense planted woodland (including aspen, alder, field maple, with some pine, rowan (*Sorbus aucuparia*), birch (*Betula* sp.), hawthorn, and dogwood), and very coarse grassland with a variety of shrubs including large amounts of sea buckthorn. Frequently flooded, saltmarsh. Two, large saline ponds with little aquatic or marginal vegetation but some important invertebrate

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					species typical of saline lagoons of SSSI quality. This is a wetter area enclosed on all sides by high banks with a mixture of reedbed (c.70%), areas of saltmarsh vegetation with the occasional pool, and drier areas of coarse grassland. A c.10-20m wide strip of trees has been planted along the southeast edge. The saltmarsh vegetation occurs at the wetter edges of the reedbed and includes glasswort (*Salicornia europaea*), lesser sea-spurrey (*Spergularia marina*) and a small unidentified rush (*Juncus* sp.). The more negotiable areas on higher, drier ground have large amounts of saltmarsh rush, clumps of distant sedge, sea aster (*Tripolium pannonicum*), brookweed, common fleabane, sea-milkwort, and sea couch. Fennel pondweed was found in some of the small pools that were present, and wood small-reed (*Calamagrostis epidejos*) occurred in patches throughout.'
Risegate Eau	0	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	W	9km	Main Habitat: Coarse or rank grassland, drain, linear reedbed, scrub. 'A central 9km of a 15km long watercourse extending from South Forty Foot Drain in the west to River Welland in the east. Channel size varies from one to about six metres wide. Banks along the 65m of drain that is west of Allen's Bridge have been managed and studied by local resident Leslie Hebdon since the late 1980s, during which time a selection of nectar-rich and pollen-rich plants have been introduced to encourage insect populations. Population of the locally and nationally rare Deptford pink (*Dianthus armeria*). A very small patch of adjacent woodland planted in 1990 comprises native trees and shrubs such as pedunculate oak, alder, goat willow (*Salix*

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					caprea), field maple, alder buckthorn, hazel, guelder-rose (*Viburnum opulus*) and hawthorn. A good diversity of insects include: Essex skipper, common blue, gatekeeper, shaded broad bar, blood vein (*Timandra comae*), silver Y (*Autographa gamma*), Roesel's bush-cricket (*Metrioptera roeselii*), common carder bee (*Bombus pascuorum*), brown hawker (*Aeshna grandis*) and common darter. Other fauna recorded were reed warbler, kingfisher (*Alcedo atthis*), common snipe, grey heron (*Ardea cinerea*), moorhen, green sandpiper (*Tringa ochropus*) and common frog. Water voles (*Arvicola amphibius*) were present near Allen's Bridge in 2013 and have been known to occur there for many years. Records show that there is an excellent selection of bees, wasps, and other insects west of Allen's Bridge. One of these, the large garden bumblebee (or ruderal bumblebee) (*Bombus ruderatus*), is a nationally notable UK BAP species, while the nationally rare tawny longhorn beetle (*Paracorymbia fulva*) is listed as RDB3. The abundance of dandelion (*Taraxacum officinale*) and white dead-nettle (*Lamium album*) is important in providing food for bees immediately after they emerge from hibernation.'
A16 verges North of the River Glen	0.6	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	SW	0.9km	Main Habitat: Coarse or rank grassland (also scattered scrub, ditch) 'Neutral grassland of moderate quality and includes soil mounds created by black ants. A few plants of interest here are common bird's-foot-trefoil, hop trefoil, meadow vetchling, tufted vetch, common knapweed, cat's-ear, yarrow, glaucous sedge, and red fescue. Other species reflect the lack of management, and include bristly oxtongue, colt's-foot, field bindweed, hogweed, mugwort, horseradish, common nettle and false oat-grass. Damp habitat in or

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					near the ditch is characterised by common fleabane, amphibious bistort, yellow loosestrife, water figwort, bulrush, common reed, and jointed rush. Vegetation on the road edge includes salt-tolerant plants such as buck's-horn plantain, grass-leaved orache and reflexed saltmarsh-grass. Woody species are a minor element of the flora, but include sycamore, willow, hawthorn, dog-rose, and bramble.'
South Bank Fosdyke	0	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	NNE	1.9km	Main Habitat: Coarse or rank grassland, saltmarsh (also scattered scrub, unimproved neutral grassland, mudflat). 'A man-made raised floodbank with wide berm along the southern side of the River Welland. The grassland is a mixture of rough neutral grassland dominated by sea couch, with areas of more calcareous finer grassland, particularly on the south facing bank. The banks are cut for hay and a loose management regime is in place. Abundant snail, grasshopper and butterfly species observed.'
Surfleet Bank	0	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	NNW	0.8km	Main Habitat: Neutral grassland (also scrub, coarse or rank grassland, semi-improved calcareous grassland) 'A 540m long strip of sandy embankment and adjacent flat pasture on the north-western side of the tidal River Welland. One of only two localities in Lincolnshire where the autumn lady's tresses orchid (*Spiranthes spiralis*) has been seen in the last 20 years. Previously recorded in 1994 where the grassland flora includes lady's bedstraw, fairy flax (*Linum catharticum*), common bird's-foot-trefoil, yellow oat-grass (*Trisetum flavescens*), quaking-grass (*Briza media*), and good quantities of the uncommon prickly sedge (*Carex vulpine*). Now subject to high level of rabbit occupation.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					Good quality neutral grassland, especially on the north-west facing slope, supporting a selection of butterflies and day flying moths, as well as many soil mounds created by black ants (*Lasius niger*). Amongst the plants present are cat's-ear, bulbous buttercup (*Ranunculus bulbosus*), meadow vetchling, lady's bedstraw, crested dog's-tail, sweet vernal-grass, quaking-grass and over 30 flowering spikes of pyramidal orchid. In addition, the south-east facing slope supports plentiful knotted hedge-parsley, a rather uncommon plant of barish places near the sea. Below this, some fairly coarse vegetation grades into saltmarsh.'
Surfleet Seas End Saltmarsh	0.7	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	W	1.7km	Main Habitat: River, marsh, calcareous grassland (also saltmarsh, mudflat, anthills, steep slopes, seasonally wet/ damp areas. 'This site is adjacent to the tidal River Welland and forms the part of the flood plain for this river. Some of the flat is inundated daily but most is only flooded at Spring tide. There are three main habitats: patches of tidal mud flat, tidal salt marsh and calcareous grassland higher up the bank and on the bank top. The Vernatt's Drain runs the length of the site on the other side of the bank. Although the species count for the site, it is one of very few accessible salt marshes in this area with a public footpath through part of the site and the entire length on the adjacent bank. Few birds were observed on the day, but this stretch of river is known to be valuable for birds with regular visits from waders of all sorts, birds of prey, sand martins (*Riparia riparia*) and many others.'
Vernatt's Drain	0.7	ECC 14: Surfleet Marsh	SW	10.7km	Main Habitat: Drain, calcareous grassland, neutral grassland, reedbed, coarse grassland (also scattered non-planted trees,

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
		OnSS/Marsh Drove to Connection Area			tussocky vegetation, steep slopes. South-facing slopes, earthworks/ hummocky ground) 'Vernatt's Drain is a large man-made watercourse resulting from the amalgamation of Counter Drain, North Drove Drain and South Drove Drain at Pode Hole. Substantial stretches with a rich grassland flora. Species often found in good quality neutral grassland include yellow rattle, common knapweed, lady's bedstraw, pignut (*Conopodium majus*), southern marsh-orchid, tufted vetch, meadow vetchling, crested dog's-tail and sweet vernal-grass. Plants typical of calcareous soils are also present. Common reed dominates much of the water's edge, but there are sections where a rich mixture of other wetland vegetation occurs. Some of the waterside plants in these places are flowering-rush (*Butomus umbellatus*), yellow iris, water dock, common club-rush, branched bur-reed, fool's-water-cress, lesser water-parsnip, water-cress, reed canary-grass and reed sweet-grass. Species characteristic of marshy areas include meadowsweet, marsh-marigold (*Caltha palustris*), angelica, common fleabane, brooklime (*Veronica beccabunga*), water mint, common spike-rush, and common and jointed rush. In addition, the presence of sea club-rush, sea-purslane (*Halimione portulacoides*), sea couch and reflexed saltmarsh grass (*Puccinellia distans subsp. Distans*) suggests that the drain water includes a slightly saline element. Amongst the many aquatic plants recorded in the period 2009-11 are five pondweeds, namely curled pondweed (*Potamogeton crispus*), hairlike pondweed (*Potamogeton trichoides*), fennel pondweed, flat-stalked pondweed (*Potamogeton friesii*) and perfoliate pondweed

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					(*Potamogeton perfoliatus*). The aquatic flora also includes arrowhead (*Sagittaria latifolia*), spiked water-milfoil, mare's-tail, water-violet (*Hottonia palustris*), rigid hornwort (*Ceratophyllum demersum*), fan-leaved water-crowfoot (*Ranunculus circinatus*), fat duckweed (*Lemna gibba*), unbranched bur-reed (*Sparganium emersum*) and the national rarity ribbon-leaved water-plantain (*Alisma gramineum*). The site supports a good range of fauna, including breeding populations of reed and sedge warblers, reed bunting and sand martin. Amongst the invertebrates present are small skipper, small heath (*Coenonympha pamphilus*), ringlet, meadow brown, gatekeeper, smoky wainscot moth (*Mythimna impure*), common blue damselfly and Roesel's bush-cricket. An otter spraint was also found.'
Moulton River	1.0	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	NE	5.4km	Main Habitats: Course or rank grassland, drain, and reedbed 'Site comprises stretch of canalised drain and associated banks, travels northeast towards Holbeach River but very low flow and shallow leading to algal growth, although water quality good with diverse aquatic flora. Bankside flora comprises ruderals and neutral grassland species with scrub/ trees scarce. Site surveys have recorded a range of invertebrates, red list birds, and common toad (*Bufo bufo*).'
Moulton River	1.0	ECC 14: Surfleet Marsh OnSS/Marsh Drove to	NE	5.4km	Main Habitats: Course or rank grassland, drain, and reedbed 'Site comprises stretch of canalised drain and associated banks, travels northeast towards Holbeach River but very low flow and shallow leading to algal growth, although water quality good with diverse aquatic flora. Bankside flora comprises ruderals and neutral

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
		Connection Area			grassland species with scrub/ trees scarce. Site surveys have recorded a range of invertebrates, red list birds, and common toad (*Bufo bufo*).'
River Glen Corridor	1.0	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	WSW	21.6km	Main Habitat: River, coarse or rank grassland, semi-improved neutral grassland (also scrub, linear reedbed, scattered non-planted trees, steep slopes, ROW, south-facing slopes. 'This is a botanically rich 20km stretch of the River Glen between Baston and Thurlby Fens Site of Special Scientific Interest and a sluice near the confluence with the River Welland. The 10-25m wide channel and both banks are included, as well as a strip of adjacent grassland within Willow Tree Fen nature reserve. The Macmillan Way long distance footpath is beside the river throughout. A wide range of aquatic plants in the river includes fennel and perfoliate pondweed, yellow water-lily (*Nuphar lutea*), whorled water-milfoil (*Myriophyllum verticillatum*), common, fat and ivy-leaved duckweed, water starwort (*Callitriche stagnalis*), unbranched bur-reed, arrowhead, rigid hornwort, water-crowfoot and *Riccia fluitans* (an aquatic liverwort). Amongst the diverse waterside flora are blue water-speedwell (*Veronica persica*), water-cress, brooklime, marsh woundwort (*Stachys palustris*), water forget-me-not (*Myosotis scorpioides*), common fleabane, yellow iris, water dock, reed sweet-grass, reed canary-grass, common reed, greater pond-sedge and tufted-sedge (*Eriophorum angustifolium*). Coarse grassland dominates drier habitats, but species typical of good neutral grassland are also present, such as common bird's-foot-trefoil, lady's bedstraw, yellow rattle, pignut (*Conopodium majus*), common knapweed, meadow vetchling, crested dog's-tail, yellow

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					oat-grass, tor-grass (*Bromus madritensis*) and glaucous sedge. A few parts are quite well wooded, but typically the banks only support a scatter of woody plants, including grey willow (*Salix cinerea*), goat willow, white willow (*Salix alba*) and crack willow, hawthorn, elder, sycamore and bramble.'
Blue Gowt Drain, North	1.2	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	W	1.1km	Main Habitat: Drain, coarse or rank grassland (also scattered scrub, linear reedbed) 'Measuring 1.1km long and 6-10m wide, this stretch of watercourse is of national significance due to the presence of a population of ribbon-leaved water-plantain, a species also occurring naturally in the nearby Counter Drain/Vernatt's Drain complex, but only in two other places in Britain. Consequently, the plant is protected under Schedule 8 of the Wildlife and Countryside Act (1981), is considered Critically Endangered, and is the subject of a Biodiversity Action Plan. It appears that ribbon-leaved water-plantain only grows and sets seed in Blue Gowt Drain in the years immediately following de-silting. The last record here was in 2007, when an estimated 50 plants produced 36 fruiting heads, as reported by Richard Lansdown. Other aquatic plants seen in 2012 were spiked water-milfoil, perfoliate and fennel pondweed, duckweed and the non-native Nuttall's waterweed (*Elodea nuttallii*). Waterside species include yellow iris, water figwort, meadowsweet, amphibious bistort, great willowherb, reed sweet-grass, reed canary-grass, common reed, and greater pond-sedge. Drier bankside habitat is mostly dominated by coarse grassland, as well as some hawthorn and elder bushes. Some of the more

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					interesting plants here are tufted vetch, meadow vetchling, lesser trefoil, and red fescue.'
Pinchbeck Marsh	1.5	ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area	SW	2.3km	Main Habitat: Calcareous grassland (also river, reedbed) 'The original SNCI here is now a large area of arable land between the Vernatt's Drain and the River Welland. Two crops were being grown there at the time of survey, wheat, and potatoes. The potato crop had recently been sprayed with acid. The southern end of this site is formed by the bank of the A16 Spalding Bypass and was also once the bank on the old Spalding to Boston Railway. When the road was completed in the early 1990s the verge was landscaped, and some planting took place on this bank. The Welland bank is more open and true grassland. On the river side of the bank there are patches of rank vegetation, but most is grassland, cut once a year by the EA. Some areas on the field side have been closed off and used to graze cattle. This stretch of the Welland is tidal. Incidental bird sightings included 35 mallard, a grey heron and a shag (*Gulosus aristotelis*) on or by the water.'
Lincolnshire Wildlife Trust Reserves					
Anderby Marsh	0	ECC 1: Landfall to A52 – Hogsthorpe	NNE	24ha	Main Habitat: Traditional coastal grazing marsh 'Managed to support a range of conservation priority birds including lapwing, curlew, redshank, snipe, barn owl, starling, and reed bunting. The adjacent reedbed fringes attract numerous reed, sedge, and Cetti's warblers. Marsh harrier is a regular sight in the summer as is cuckoo.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					The southern section of the Reserve is also designated as Anderby Creek Sand Dunes LWS.'
Wolla Bank Reedbed	0	ECC 1: Landfall to A52 – Hogsthorpe	ENE	3ha	Main Habitats: Small pools, grassland with sea club-rush and sea couch. 'Water rail, reed warbler, sedge warbler, Cetti's warbler, grasshopper warbler, reed bunting and whitethroat all nest. Marsh harrier and hobby occur regularly in the summer and short-eared owls can be present in winter. Bearded tit is a regular visitor in the winter. Starling murmuration's can sometimes be present in the winter months. The Reserve has no other designation but lies between Anderby Creek Sand Dunes LWS to the north and Wolla Bank South LWS to the south.'
Wolla Bank Pit	0.3	ECC 1: Landfall to A52 – Hogsthorpe	E	4ha	Main Habitat: Flooded clay pits, reed bed, chalk grassland. 'Extensive reedbeds and sea club-rush, with great reedmace, fennel pondweed, wild celery, sea arrowgrass and water-crowfoot. Colonies of common spotted orchid. Winter birds include snipe, fieldfare, redwing, and song thrush, with bittern and bearded tit occasionally visiting. Also important for breeding populations of reed and sedge warblers, reed bunting and little grebe. Invertebrates include many species of lepidoptera and odonata. The Reserve has no other designation but is adjacent to Wolla Bank South LWS.'
Moulton Marsh	0.3	ECC 12: Marsh Road to Fosdyke Bridge	NNE	36ha	Main Habitat: Broad-leaved woodland, scrub, saline lagoons, shallow tidal scrapes, grassland, saltmarsh. 'Young, planted broad-leaved woodland (6ha), two large saline lagoons with islands, river with shall tidal scrapes, and saltmarsh

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					totalling 6.5ha in area. This reserve also includes the 26.3ha Moulton Marsh LWS. The woodland and scrub habitats support a good population of tits, finches, whitethroats, and buntings. The lagoons are an important wintering area for little grebe and water rail. Redshank and little egret are regularly seen on the scrapes. The flood protection bank alongside the reserve has a variety of wildflowers, including pyramidal orchid, and attracts butterflies and other insects. Strawberry clover and sea-milkwort occur on the reserve.'
Chapel Six Marshes	0.5	ECC 1: Landfall to A52 – Hogsthorpe	E	2.2ha	Main Habitat: coarse or rank grassland, lake, reedbed, scrub – scattered/ dense 'A 750m stretch of coast forming part of the wider Chaper Six Marshes LWS designation. The northern, smaller area forms part of the Chapel Six Marshes LWS, while the remainder has visitor facilities much used by the public, owned, and managed by Lincolnshire County Council (LCC). Features common to both, from east to west, are bare sand on the upper beach; a line of low fixed dunes succeeded westwards by flatter dry habitat; and finally an old embankment beside the road. The upper beach is within Chapel Point to Wolla Bank geological SSSI.'
Frampton Marsh	0.7	ECC 11: The Haven to Marsh Road	E	172ha	Main Habitat: Saltmarsh 'The reserve is part of the most mature saltmarsh in The Wash and is exceptionally rich in plants, birds, and invertebrates. The upper levels, which have extensive zones of sea-lavender, sea aster and sea-purslane, are intersected by large creeks, one of which was the old course of the River Witham before the new cut was made in 1880.

Site Name	Distance from the Order Limits (km)	Nearest Segment of the ECC	Compass Direction	Area/Length of Site (ha/km)	Description
					The area supports regular breeders such as redshank, oystercatcher, reed bunting, meadow pipit and skylark. In winter the saltings attract wigeon, mallard, shelduck, teal and brent geese, with large flocks of finches and buntings, notably linnet and twite (*Linaria flavirostris*) and birds of prey such as hen harrier and merlin (*Falco columbarius*). The tidal mudflats form part of the wader feeding grounds, which give the Wash its international status. Large flocks of dunlin occur, as well as considerable numbers of grey plover, whimbrel, curlew, bar-tailed godwit, and greenshank. The Trust's reserve is grazed together with the RSPB's reserve to the south.'
Friskney Decoy Wood	0	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	SW	6.0ha	'The site is comprised of woodland which is on a thin peat soil, mostly consisting of birch, sycamore and Scots pine with rowan, alder, willow and aspen. There are also larch, spruce and Corsican pine. Some woodland may have grown here before draining of the East Fen including a variety of novelty veteran trees, but most of the trees have been planted. The ground flora is dominated in parts by bracken and buckler-fern. The climbing corydalis, a localised plant in eastern England, occurs throughout the wood. Over 30 species of birds have bred, and large numbers use the wood in winter for feeding and roosting. The main objectives of management are to maintain and enhance a varied woodland of mainly native trees and to retain the relict decoy pond and pipes as a wetland area.'

21.5.3.3 Habitat Networks (England)

29. Natural England published spatial dataset that describes the extent and location of 18 priority habitat types, combined with opportunities for priority habitat restoration, creation, enhancement, and connection with associated habitats in the surrounding landscape. The Habitat Network Maps provide spatial information on the presence of existing habitats and areas suitable for action to improve the resilience of the networks identified. Some of these networks lie within, or near to, the Order Limits. Mapping is available from Natural England on the Catchment Based Approach Data Hub website or via magic.defra.gov.uk.
30. Habitat Networks and opportunity areas have been identified around several priority habitats within the Order Limits, including coastal sand dunes at Wolla Bank and habitat mosaics (including coastal saltmarsh and mudflats) on The Haven and River Welland. There are also several occurrences of habitat opportunity areas (including Fragmentation Action Zones, Network Enhancement Zones 1 and 2 and Network Expansion Zones), that are within the Order Limits but are associated with priority habitats beyond it. Occurrences include the coastal priority habitats associated with The Wash between Boston and the River Welland, and restorable coastal floodplain and grazing marsh to the southwest of Hogsthorpe.
31. For the purposes of the assessment, Habitat Network Opportunity Areas are not formally valued within the EcIA frame of reference (refer to Section 21.5.2) and they are not progressed through the detailed impact assessment. These areas have been used as a reference source to guide habitat mitigation and enhancement efforts. Known areas of priority habitat have been identified in the UKHab Classification Survey Report (Appendix 21.2), subject to survey and valuation using the methods set out in Section 21.5.2.

21.5.4 Habitats

21.5.4.1 Annex 1

32. The UKHab survey identified small areas of Annex 1 habitat associated with the coast and occurring in Segment ECC 1. The two Annex 1 habitats and associated codes are:
    - Embryonic shifting dunes (H2110) (UKHab s3a5); and
    - Dunes with sea buckthorn (H2160) (UKHab h3c5). It was observed that the majority of sea buckthorn surveyed was planted for dune stabilisation and therefore unlikely to meet the Annex 1 definition, although the presence of smaller patches of native and semi-natural sea-buckthorn cannot be categorically ruled out based on the information available. Much of the planted sea-buckthorn is on coastal sand dune habitat (UKHab s3a), semi-natural stands of which may meet the S41 or Annex 1 definition if not for the presence of dense stands of planted sea-buckthorn.
33. Both habitats occur near landfall and in areas within the Order Limits that will be subject to trenchless techniques.
34. Tidal sections of The Haven (Boston) and the River Welland (Fosdyke Bridge), which flow into The Wash, are located within ECC 10 to ECC 12 and ECC 14. As these rivers are associated with The Wash estuary, the Annex 1 habitat type Estuaries (H1130) has been assigned for these river

sections, along with associated inter-tidal riverbank habitats including mudflats (t2d) and saltmarsh (t2a). All habitats meeting the Estuaries Annex 1 habitat complex are identified as UKHab secondary code 30, a total of 26.73ha within the study area.

35. Additional small areas of other Annex 1 habitat types, notably coastal saltmarsh and intertidal mudflat may also occur within Estuaries (H1130) and/ or the relevant S41 habitats identified and described in more detail below. These Annex 1 habitats are sub-sets of the S41 habitat or better described as a subset of the Estuaries habitat complex. The areas where these habitat definitions overlap within the survey area are extremely small and to avoid double counting, these have not been classified independently as Annex 1 habitat.

21.5.4.2 Section 41 Priority and Lincolnshire Biodiversity Action Plan (BAP) Habitats

36. Habitats of Principal Importance (i.e., those included under Section 41 of the NERC Act (2006), many of which are also included on Annex 1 of the Habitats Directive, have been identified in Natural England's Priority Habitat Inventory dataset (MAGIC website).

37. The Lincolnshire Biodiversity Action Plan (LBAP) (Lincolnshire Biodiversity Partnership, 2011) seeks to identify and meet the needs of those UK priority species and habitats found in Lincolnshire.

38. Table 21.7 provides a list of Natural England's Priority Habitats and LBAP habitats that have been identified within the UKHab survey area (Order Limits + 100m buffer) through a combination of desk and field study. Important Habitats (see Figure 21.2.2 of Appendix 21.2: UK Habitat Classification Report (document reference 6.3.21.2) illustrates the location and extent of these habitat types. Definitions and further information on the location and condition of the habitat stands recorded are provided in Appendix 21.1: Onshore Ecology Desk Study (Document Reference 6.3.21.1).

Table 21.7 S41 and LBAP Habitats within the UKHab Survey Area (Order Limits +100m buffer)

Habitat Name	S41 or LBAP Habitat	Area (ha) or Length (m) Within Survey Area
Marine Inlets and Transitional Waters		
Coastal saltmarsh (UKHab t2a) Including Estuaries (UKHab 30)	S41 and LBAP Habitat, subset of Annex 1 habitat	1.22ha
Intertidal Mudflats (UKHab t2d) Including Estuaries (UKHab 30)	S41 Habitat, subset of Annex 1 habitat	5.37ha
Grassland		
Coastal and floodplain grazing marsh / Grazing marsh, characteristically neutral grassland and modified grassland (UKHab g3 25 and g4 25)	S41 Habitat complex / LBAP Habitat	g3 25 – 3.95 ha g4 25 – 19.37 ha
Wetland		
Reedbeds (f2e)	S41 habitat	1.99ha
Sparsely Vegetated Land		

Habitat Name	S41 or LBAP Habitat	Area (ha) or Length (m) Within Survey Area
Coastal sand dunes (UKHab s3a5). NB: There are additional areas of coastal sand dune that are dominated by planted sea buckthorn scrub and therefore classified as h3c (not Annex 1 type).	S41 and LBAP Habitat	1.93ha
Farmland		
Arable field margin (UKHab c1a, c1a5)	S41 habitat	85.48ha
Hedgerows (including hedgerows with trees) (UKHab h2a)	S41 habitat	12,620m
Rivers and Lakes		
Priority Ponds (and Lakes) (UKHab r1 19)	S41 habitat	0.7ha

39. Hedgerows and trees, and ponds and standing water are discussed further in subsequent sections.
40. Stands of S41 or LBAP habitats identified in Table 21.7 and where they occur within the Order Limits are assessed as having **county** importance.
41. In addition to the S41/ LBAP Habitats identified by the Desk Study, Lowland Mixed Deciduous Woodland and Wet Woodland (both S41 habitats of principal importance) have been identified during the UKHab field survey and are discussed separately in the subsequent section as there are no areas of these habitats within the Order Limits. No Ancient Woodland is present within the Study Area.

21.5.4.3 UKHab Survey

42. Habitats within the survey area (Order Limits + 100m buffer, reported as 2864.9ha) are, for the most part, unexceptional and reflect the lowland, intensively agricultural nature of the landscape. Several habitats of nature conservation importance have been identified, including Annex 1 and S41 habitats. Those habitats of conservation importance that are within the UKHab survey area are highlighted in Table 21.7 S41 and LBAP Habitats within the UKHab Survey Area (Order Limits +100m buffer) Table 21.7 above.
43. There are 49 Primary Habitats in UKHab (Level 2 – Level 5) identified within the UKHab Survey area. Cropland (UKHab c1 Broad habitat type and subdivisions at UKHab Levels 4 & 5) is the most extensive habitat within the survey area (2,363ha or 82.48% of the total area) and within the Order Limits (88.08% of land within the Order Limits). A very small proportion of cropland has been identified as of conservation value, i.e. the 85.48ha of arable field margins.
44. Grasslands are the next most abundant habitat type (287.18ha or 10.02% of the total area). More than half of the grassland surveyed was characterised as modified grassland (UKHab g4), a ubiquitous habitat in lowland England of low conservation value. All other grasslands are neutral grasslands (g3 and subdivisions at UKHab Levels 4 & 5) with no stands of higher conservation value neutral grasslands identified.

45. Dense scrub (UKHab h3) occurs in very small patches throughout the survey area, with a total of 10ha across the whole survey area. Woodland (w1 and w2) is similarly scattered in small patches and in total only accounts for 22.55ha of the survey area. No woodland or scrub habitats of high conservation value occur within the Order Limits.

46. Urban habitats (u1 and sub-divisions) including roads, buildings and hardstanding account for 71.86ha of the survey area, or 2.51%. Rivers (UKHab r2b) account for slightly more than 2% of the total habitat area surveyed (59.91ha). The remaining 1.5% of the survey area is accounted for by small areas of inter-tidal habitats, saltmarsh, reedbed and ponds, which are typically habitats of higher conservation value and are highlighted in Table 21.7.

21.5.4.4 Veteran Trees

47. The difference between an ancient and a veteran tree is described below:

> *'Veteran is a term describing a tree with habitat features such as wounds or decay. The terms ancient and veteran have been used interchangeably in the past, however, it is important to know the differences between them. A veteran tree is a survivor that has developed some of the features found on an ancient tree, not necessarily as a consequence of time, but of its life or environment. Ancient veterans are ancient trees, not all veterans are old enough to be ancient. A veteran may be a young tree with a relatively small girth in contrast to an ancient tree but bearing the 'scars' of age such as decay in the trunk, branches or roots, fungal fruiting bodies, or dead wood. These veteran features will still provide wildlife habitat.'* Ancient Tree Guide No.4, Woodland Trust.

48. A search of the Woodland Trust's Ancient Tree Inventory did not return any records of ancient or veteran trees within the Order Limits. The nearest ancient or veteran trees listed within the Inventory were recorded >3km from the Order Limits.

49. Data collected during the PRAs of trees (for bats) was reviewed to search for records of trees that could be ancient or veteran. Of the 146 trees identified within the Order Limits, 52 trees occurred within areas proposed for temporary or permanent works. It has therefore been assumed that the remainer would be retained, through embedded mitigation (principally site selection and alignment principles), as described in the supporting document OLEMS (Document Reference 8.10).

50. Of the 52 potentially impacted trees, 12 could not be surveyed due to access limitations, 39 trees were recorded as having negligible or low potential for bats, and one tree was assessed as having high potential.

51. Trees recorded as having negligible or low potential for bats, on account of a lack of potential roost features such as splits, lifted bark and cavities (which generally develop with increasing age), would be unlikely to be ancient or veteran and so were screened out of further analysis.

52. Data on the high potential tree was subject to further analysis. Notes on the tree diameter, height, the presence of potential roost features and general condition along with photographs were checked, where available, to identify whether it could be ancient or veteran.

53. The most reliable characteristics of ancient and veteran trees are the presence of cavities, damage, bark loss, dead wood, crevices, fungi and the type of growth form, with diameter measurements being only indicative. However, the Woodland Trust do provide useful minimum

dimensions for the girth (diameter) of ancient and veteran trees, and these were used to further screen the data collected during the PRA surveys. The minimum dimensions adopted, with reference to guidance provided by the Woodland Trust, are set out in Table 21.8 below.

Table 21.8 Minimum diameter for ancient and veteran trees

Species recorded	Ancient tree girth[2]	Veteran tree girth[3]
Oak	>3m	4.75m
Ash	>2m (if pollarded)	3.75m
Beech	>2.5m (if pollarded)	3.75m
Hawthorn	>1.25m (if pollarded)	0.75m
Sweet chestnut	>3.5m if pollarded	4.9m
Willow	None given	None given
Sycamore	None given	4.5m
Poplar	None given	None given

54. Tree 4954, located in ECC 13, was recorded as a pollarded willow (Salix sp.) with a diameter of c.1m, c.8m tall, with a single rot hole, but was not considered ancient and did not have any other features associated with ancient or veteran trees.

55. In summary, no veteran trees were identified within areas affected by temporary or permanent works, however 12 trees were not subject to detailed assessment due to access restrictions.

56. Although not progressed within the impact assessment, precautionary mitigation measures for all mature trees, including any with potential veteran tree features are proposed including avoidance measures and pre-construction surveys for any trees that must be removed (see OLEMS (Document Reference 8.10).

21.5.4.5 Rare Arable Weeds and Uncommon Plants

57. The desk study did not return any records of important plant species from within the Order Limits.

58. The Greater Lincolnshire Nature Partnership (GLNP) produced a report on the status of scarce arable plants in Greater Lincolnshire (Baker *et al.*, 2016). The report presented the results of a desk study and was intended to help ecologists (amongst others) to highlight key areas of importance for arable plants, identify where further surveys are needed and identify areas for habitat enhancement works.

59. For the purposes of this impact assessment, records presented in the GLNP report dating from prior to 2001 are not included.

60. For the period 2001-2016 there was a single hectad record of maple-leaved goosefoot (*Chenopodium hybridum),* located west of Wainfleet Allsaints, near to ECC 5 and ECC 6. This species is an annual, associated with disturbed, nutrient-rich arable land and waste ground, favouring humus-rich cultivated soils in lowland Fens.

[2] https://ati.woodlandtrust.org.uk/how-to-record/species-guides/
[3] https://www.woodlandtrust.org.uk/media/1836/what-are-ancient-trees.pdf

61. For the period 2001 – 2016 there were four hectad records of white wall-rocket (*Diplotaxis erucoides*), one located west of Skegness near to ECC 1, another southwest of Wainfleet Allsaints near to ECC 6, and the remaining two located northeast of Boston near to ECC 9 and ECC 10. The GNLP report describes white wall-rocket as a casually occurring annual, associated with arable and waste ground and favouring sandy loams and clay soils.
62. There are records of rare and scarce plants from data associated with locally and nationally designated sites which are presented in summary in Tables 215 and 216 above. With the exception of plants recorded at Sea Bank Clay Pits SSSI, none of these records are within or directly adjacent to the Order Limits.
63. The UKHab survey did not record any occurrences of red list plant species associated with arable habitats within the Order Limits. However, given that arable weeds may not grow in each year, and can remain for some years as ungerminated seed in the soil, the survey may simply not have encountered such species because they did not grow in 2023.
64. In summary, no rare arable weeds were recorded within the Order Limits during field survey, and no records were for the Study Area from the GLNP data request, although historic data (Baker *et al*., 2016) suggests that certain annual plant species of conservation concern could be present occasionally in the wider area.
65. The largely intensive agricultural management of land within the Order Limits suggests that the use of herbicide and pesticide is widespread across the area, and this would reduce the likelihood of rare arable weeds being present. Dense and uniform cropping and growing winter sown crops are further threats to rare arable weeds (Baker *et al*., 2016).
66. As the presence of rare arable weeds has not been recorded, this group of plants has not been progressed through the detailed impact assessment. However, due to the potential for rare arable weeds to be present either as dormant seed within a seedbank, or to naturally colonise from neighbouring populations as windblown seed, precautionary mitigation measures are proposed including top-soil management and pre-construction surveys for any directly impacted suitable habitat (see OLEMS, Document Reference 8.10).

21.5.4.6 Important Hedgerow Survey

67. The full method and results of the important hedgerow survey are reported in Appendix 21.3 Important Hedgerows Survey (Document Reference 6.3.21.3). This section of the report primarily focuses on whether hedgerows meet the ecological criteria within the Hedgerow Regulations (1997). Chapter 20: Onshore Archaeology and Cultural Heritage (Document Reference 6.1.20) presents an assessment of whether hedgerows meet the non-ecology criteria. The results of both assessments are presented below, in order to identify the total number of 'important' hedgerows present within the Order Limits.
68. To inform the assessment against ecological criteria, hedgerows within the Order Limits were identified using aerial mapping and during UK Hab surveys, as reported in Appendix 21.2: UK Habitat Classification Survey (Document Reference 6.3.21.2). A total of 72 hedgerows were identified within the Order Limits, totalling 6.039km.
69. An initial filter of all hedgerows was undertaken to identify those that were capable of being

'important' under the Hedgerow Regulations, due to their age (>30 years) and the number of species recorded within them (>4 woody species per hedgerow). The initial filter identified only six hedgerows within the Order Limits that were >30 years old and supported >4 woody species; hedgerows 168, 546, 1036, 1926, 1928, and 1948.

70. Targeted surveys were then undertaken on hedgerows 168 and 546, to record other features that would meet the criteria for 'important' under the Hedgerow Regulations. The remaining three potentially important hedgerows were assessed using UKHab field survey data and historical imagery from Google Earth Pro. Where data was missing to adequately assess a hedgerow, a precautionary approach was adopted. Of the six hedgerows, a total of three were considered to be 'important' under the Hedgerows Regulations: Hedgerows 546, 1926 and 1928.

71. The assessment against historic criteria, identified 37 hedgerows that qualified as 'important', as Study identified in Appendix 20.2: Heritage Statement, largely due to the hedgerows being depicted on historic maps or through association with Heritage Assets. Hedgerow 1926 being the only hedgerow meeting both the ecological and the historic criteria. Regardless of whether hedgerows meet the Hedgerow Regulations criteria, all hedgerows with >80% native woody species are Section 41 Priority Habitats under the NERC Act and therefore are of conservation significance, although in part due to habitat network connectivity function they provide for multiple species in an intensively agriculturally managed landscape.

72. Within the Order Limits, of the hedgerows surveyed, all bar six hedgerows support less than four woody species and many are less than 30 years old, and these characteristics are typical of hedgerows within the local area and beyond. Therefore, the hedgerow resource within the Order Limits is assessed as being of **local** importance only.

21.5.5 Species

21.5.5.1 Plants

73. GLNP did not return any records of important plants from within the Order Limits, but within the wider Study Area there were records of bluebell and Deptford pink which are both protected under the Wildlife and Countryside Act 1981 (as amended). Deptford pink is also classified as endangered on the Vascular Plant Red Data List for Great Britain (Cheffings, C.M. *et al*., 2005). Boston horsetail (*Equisetum ramosissimum*) is recorded from a single location within 1.3km of ECC 11 (see Table 5-3, Slippery Gowt Sea Bank LWS). This plant is extremely rare in the UK, definitively known only from c.3 locations. The plant is listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) (WCA1981), but it's status as a native species is questionable (Rumsey, F.J and Spencer, M., 2012).

74. Statutory and non-statutory sites within the Study Area also contain important plant records which are described in Appendix 21.1: Onshore Ecology Desk Study (Document Reference 6.3.21.1).

75. North Norfolk Coast and The Wash Important Plant Area[4] is situated 146m east of ECC 11. The IPA has been identified for the vascular plant species richness of coastal habitats. '*The saltmarshes hold four species of sea-lavender (including matted sea-lavender (Limonium bellidfolium), a species now confined to Norfolk within the British Isles). Present are marsh-mallow, shrubby sea-blite (Suaeda vera), sea purslane, salt meadow sedge, sharp sea rush or sea aster. There are also several species of glasswort also known as 'samphire' and collected for the kitchen. The dunes and shingle spits hold sea-holly, sea-heath (Frankenia pauciflora), hoary mullein (Verbascum thapsus), the bright sea-pea and yellow-horned poppy (Glaucium flavum), as well as bee and pyramidal orchids, and in a few places, the dune slacks are home to marsh helleborines (Epipactis palustris) and southern marsh orchids'* (Plantlife Website).

    Although no rare or important plants have been recorded within the Order Limits, the potential for these species to occur in a dormant state, or to naturally colonise from windblown seeds has been recognised. Uncommon plants are not carried forward for detailed impact assessment, but precautionary embedded mitigation measures are proposed including top-soil management and pre-construction surveys for any directly impacted suitable habitat (see OLEMS, Document Reference 8.10).

21.5.5.2 Invertebrates

76. The assessment method was based on identifying habitats and plant species assemblage types (SATs) in the Study Area, known to be of use to invertebrates, to provide an indicator of the potential for Invertebrate Assemblages of Importance. The full methodology for invertebrate assessment and accompanying results are presented in Appendix 21.09: Invertebrate Study (Document Reference 6.3.21.09).

Desk study

77. No records of invertebrates were returned by the GNLP from within the Order Limits or the wider Study Area.
78. A total of eight statutory and 15 non-statutory designated sites were found to have important assemblages or notable and endangered species present.
79. The Desk Study identified that many of the statutory and non-statutory sites within the Study Area support important invertebrate species or important invertebrate assemblages, with Sea Bank Clay Pits SSSI being the closest statutory site to the Order Limits (immediately adjacent to it). This site supports a rich aquatic invertebrate fauna, notably beetles, including several nationally scarce species and others new to the County.
80. Non-statutory sites immediately adjacent to the Order Limits specifically noted for invertebrate interest include Havenside LWS, Risegate Eau LWS and Moulton Marsh LWS.
81. Chapel Six Marshes LWS, Hogsthorpe Pit LWS, Marsh Yard to Anderby Creek Dunes LWS and Wolla Bank South LWS, also immediately adjacent to the Order Limits, were assessed as having habitats capable of supporting important species or assemblages, although this was not

[4] Important Plant Areas (IPAs) are sites with exceptional botanical richness; rare, threatened and socio-economically valuable plant species; and rare and threatened habitats.

specifically mentioned in the designated site descriptions provide by GLNP.

82. A total of 19 species were found to be identified as locally important in the LBAP. Habitat associations of these suggest they will be present in areas identified as having medium or high terrestrial invertebrate quality, including short sward and bare ground, saltmarsh, tall sward and scrub, and brackish pools and ditches.

Habitat Appraisal

83. The invertebrate assessment identified the following priority habitats present within the Order Limits as having importance for invertebrates:

- Coastal sand dunes - high potential for terrestrial invertebrates due to the Potential SATs of sandy beaches to be present, assemblages which contain highly specialised species that are adapted to an extreme environment.
- Reedbeds - high potential for terrestrial invertebrates due to the Potential SATs of reed-fen and pools to be present. This assemblage type is characterised by a number of groups, closely associated with emergent wetland plants, some requiring shallow water or fluctuating water levels that bring potential prey within reach of ovipositing females. Shallow water either over the bottom sediments or over dense submerged plants is also essential for some groups.

84. Coastal and floodplain grazing marsh – most areas assessed as having high potential for terrestrial invertebrates due to the Potential SATs of saltmarsh & transitional brackish marsh to be present. Some areas of coastal and floodplain grazing marsh were heavily grazed, drying out or otherwise not functioning as the habitat and as a result were assessed as having low potential.

85. Priority habitat assessed as having low importance for invertebrates are as follows:

- Deciduous woodland - these areas lacked sufficient deadwood, epiphyte fauna or fungal fruiting bodies to qualify them as SATs.
- Hedgerows - these lacked areas where scrub or woodland grades into, or is interspersed with open areas of grassland, heathland or early successional vegetation types to qualify them as SATs. The juxtaposition of open vegetation with woody development is important to insects with complex life cycles that require different microhabitats at different stages of development.
- Rivers, Canals and Drains within the Order Limits are typically modified by dredging and straightening and as these watercourses lacked areas of shingle or sand and marginal vegetation to qualify them as SATs for terrestrial invertebrates, although these may be important for aquatic invertebrates.
- Mudflats were assessed as having low potential for terrestrial invertebrates as these are more associated with marine invertebrates.

86. A total of 34 land parcels were identified as having importance for terrestrial invertebrates, four of these being assessed as high quality, the remainder as medium quality. These included areas also designated for nature conservation or as Priority Habitat which is not degraded.

87. Table 21.9 below presents all land parcels assessed as having moderate or high-quality habitat for invertebrates within the Order Limits, along with the habitat type and (plant) species

assemblage type identified. The location and extent of these areas are presented in Figure 21.9.1 (document reference 6.3.21.9).

Table 21.9 Areas with Importance for Invertebrates

Segment	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Potential SATs Present
ECC 1: Landfall to A52 – Hogsthorpe	M	F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 1: Landfall to A52 – Hogsthorpe	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	H	C24: Brackish pools & Ditches F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	Saltmarsh and transitional brackish marsh Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 1: Landfall to A52 – Hogsthorpe	M	C21: Saltmarsh	Saltmarsh & transitional brackish marsh
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	F21: Tall Sward & Scrub	Rich flower resource

Segment	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Potential SATs Present
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	H	C24: Brackish pools & Ditches W24: Marshland	Saltmarsh and transitional brackish marsh Open water on disturbed mineral sediments Reed-fen and pools, undisturbed fluctuating marsh
ECC 1: Landfall to A52 – Hogsthorpe	M	C23: Sandy Beach	Sandy beaches
ECC 1: Landfall to A52 – Hogsthorpe	M	F21: Tall Sward & Scrub	Rich flower resource
ECC 1: Landfall to A52 – Hogsthorpe	M	F21: Tall Sward & Scrub	Rich flower resource
ECC 1: Landfall to A52 – Hogsthorpe	M	W22: Lake	Open water on disturbed mineral sediments
ECC 1: Landfall to A52 – Hogsthorpe	H	C24: Brackish pools & Ditches F21: Tall Sward & Scrub	Saltmarsh and transitional brackish marsh Open water on disturbed mineral sediments Rich flower resource
ECC 2: A52 - Hogsthorpe to Marsh Lane	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub W22: Lake	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 4: A158 Skegness Road to Low Road	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 5: Low Road to Steeping River	M	F23: Short Sward & Bare Ground	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 5: Low Road to Steeping River	M	F21: Tall Sward & Scrub	Rich flower resource

Segment	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Potential SATs Present
ECC 5: Low Road to Steeping River	M	W22: Lake W24: Marshland	Reed-fen and pools, undisturbed fluctuating marsh Open water on disturbed mineral sediments
ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	M	F21: Tall Sward & Scrub	Rich flower resource
ECC 7: Fodder Dike Bank/Fen Bank to Broadgate	H	F21: Tall Sward & Scrub	Rich flower resource
ECC 10: Church End Lane to The Haven	M	F23: Short Sward & Bare Ground C24: Brackish pools & Ditches	Rich flower resource Open short sward Open water on disturbed mineral sediments Saltmarsh and transitional brackish marsh
ECC 11: The Haven to Marsh Road	M	F23: Short Sward & Bare Ground	Rich flower resource Open short sward Open water on disturbed mineral sediments
ECC 12: Marsh Road to Fosdyke Bridge	M	C25: Saline Lagoon C21: Saltmarsh	Open water on disturbed mineral sediments Saltmarsh & transitional brackish marsh
ECC 12: Marsh Road to Fosdyke Bridge	M	C24: Brackish pools & Ditches C21: Saltmarsh	Saltmarsh & transitional brackish marsh Open water on disturbed mineral sediments

88. There are likely to be a range of other notable and endangered species present in the wider area, however it is unlikely that habitats are of sufficient quality or size to hold significant populations of these species.

Valuation for invertebrates

89. Detailed invertebrate surveys have not been undertaken at the land parcels above, and therefore a precautionary approach to valuation has been taken. Where the identified SAT is 'rich flower resource' only (6 Land Parcels: 5093, 9534, 12278, 6290, 23854, 24727, 7100), these are assessed as having **Local** importance for invertebrates.

90. The remaining 28 land parcels in Table 21.9 above have potential to support an invertebrate assemblage, or populations of individual species, of **County** and up to **National** importance. Although none of the parcels above are designated for their invertebrate interest, they support

habitat types that are closely aligned to those with potential to support an 'assemblage of specialised habitat' under SSSI Guidelines and are typically examples of UKBAP Priority Habitats.

91. Land Parcels 12280 and 19097, which support 'open water on disturbed mineral sediments' assemblages are assessed as having **Local** importance due to these not supporting semi-natural waterbodies or water bodies that are allowed to proceed through a natural succession, e.g. former gravel pits and quarry pools, which have potential to support assemblages of higher conservation value.

21.5.5.3 Fish

Desk Study

92. No records of fish were returned by GLNP from within the Order Limits, but three records of river lamprey (*Lampetra fluviatilis)* and one record of burbot (*Lota lota*) were returned from within 2km. The river lamprey records originated from the River Welland (crossing segment ECC 14 and running adjacent to segment ECC 13) and the burbot record from a fishing lake, c.1.5km west of the Order Limits.
93. A total of 32 fish species records were returned during a search of the Environment Agency's online records for the period 2013 – 2020, notably including eel (*Anguilla anguilla*).
94. Of the designated sites within the Study Area, many have aquatic interest, although fish were not identified within the associated citations as being a driver for any of the designations.

Fish Habitat Survey

95. Where watercourse crossings are proposed, survey locations were selected within the Order Limits which were representative of the relevant watercourses (The Haven, River Welland, River Steeping and main drains). Main tributaries and drains of the relevant watercourses within the Order Limits were also assessed. The detailed survey method is presented in Appendix 21.10: Fish Habitat Study (Document Reference 6.3.21.9) and survey locations are shown in Figures 21.9.1.1 and 21.9.1.2 (Document Reference 6.3.21.9).
96. Nine locations across the Order Limits were selected for survey and are detailed in Table 21.10 below.

Table 21.10 Fish Habitat Survey Locations

Survey Code	Segment Name	Drain or River	Upstream	Downstream
B01	ECC 12: Marsh Road to Fosdyke Bridge	River Welland	TF315321	TF322324
B02	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	Five Towns Pumping Station Drain	No Access	TF317322
B03	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	Risegate Drain	No Access	TF303316
B04	ECC 13: Fosdyke to Surfleet Marsh OnSS/Marsh Drove	River Welland	TF287302	TF296309

Survey Code	Segment Name	Drain or River	Upstream	Downstream
B05	ECC 12: Marsh Road to Fosdyke Bridge	Wyberton Branch Drain	TF352397	TF357399
B06	ECC 10: Church End Lane to The Haven	River Haven	TF355408	TF359402
B07	ECC 10: Church End Lane to The Haven	Hobhole Drain	TF366410	TF365405
B08	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	Steeping River	TF481592	TF485590
B09	ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	Steeping River	TF485602	TF490600

97. At each location, habitat features within the channel associated with fish were recorded, along with quantitative and qualitative information to enable a further desk-based quality assessment.

Fish Habitat Quality Assessment

98. During the fish habitat survey, observations and target notes were recorded to identify optimal habitat, including channel width; channel depth; flow type; substrate composition; instream and bankside cover; riparian canopy cover; fish spawning potential; riparian land uses; and associated limiting factors. From this, further analysis was undertaken, and evaluations were made for suitable spawning potential and fish habitat quality (FHQ) along the watercourse. Each survey location was then given a rating for fish habitat quality (High, Good, Moderate, Low or Poor). The full method is presented in Appendix 21.10: Fish Habitat Study (Document Reference 6.3.21.9).

99. All survey locations were assessed as having low habitat quality for fish and no habitats suitable for salmonid spawning were recorded. This was largely due to there being no fish passes at the drain system exit points, resulting in migration being completely impeded. Low water flow and macrophyte canopy were additional factors contributing to the low score.

100. All survey locations lacked suitable habitat for eels, although for survey locations B01, B04 (River Welland) and B06 (River Haven) potential for this species to migrate along the river system to utilise the feeding resource was noted.

101. The desk study suggests many species of fish are present in the Study Area, although it is noted that many records are from marine habitats. Within the Order Limits, the aquatic habitats have been assessed as being of low quality for fish, with no salmonid spawning habitats identified. Therefore, given the absence of habitat capable of supporting a fish population that is notably large, diverse or comprised of rare or protected species, the population of fish likely reliant on habitats within the Order Limits is considered likely to comprise low numbers of common and widespread species, tolerant of sub-optimal conditions. However, if eel do

migrate along the River Welland and Haven, due to their large ranges, this species would likely form part of the local eel population.

102. As a result, the general population of fish likely supported within the Order Limits are assessed as having **Site** importance only, but the population of eel that potentially could pass through the Order Limits are assessed as having **Local** importance.

21.5.5.4 Amphibians

Desk Study

103. GLNP returned records of GCN, common toad and smooth newt from within the Study Area, as well as common frog. The latter species is not considered further on the basis that it is not red listed, rare, or legally protected (other than from trade or sale) and is therefore not considered to be an Important Ecological Feature within this assessment. In addition, mitigation for the other amphibians would be sufficient to minimise impacts for common frog populations.

104. GLNP returned records of GCN from only a few locations within the Study Area, but outside the Order Limits:

- A single location near Chapel St Leonards, c.1.6km west of ECC 1;
- A cluster of records from around Burgh le Marsh (considered to comprise the same metapopulation) c 0.3km east of ECC 3;
- A single location southwest of Skegness, c. 1.95km east of ECC 4; and
- A cluster of records from around Decoy Wood (considered to comprise the same metapopulation) c.50m west of ECC 6.

105. A search for Class Licence Survey Returns published on the MAGIC website returned four records within the Study Area but outside the Order Limits. The nearest is located approximately 400m southwest of segment ECC 3, with 2017 survey data reported. The information ranged from a low-resolution record stating presence only, to a more detailed record reporting of a peak count of 9 individuals in 2017 (located c.600m north of segment ECC3), indicating the presence of a small population.

106. Black Sluice Internal Drainage Boards (IDB) list BAP for newts (no specific species mentioned) with an objective to enhance newt populations in the IDB area through habitat creation and improvements. Targets and actions are also set out within the LBAP in relation to newts. Therefore, GCN must be known to be present within the IDB area to be included in their BAP.

107. In addition, GLNP produced a report on the status of newts in 2013, presenting data collected prior to 1991, from 1991 – 2000 and from 2001-2012. Although distribution maps therein are presented at low resolution, the records show a similar distribution of GCN records to the sources referred to above, with pre 1991 records (numbers of exact locations and individuals unknown) around Skegness, Wainfleet All Saints, and Boston, 1991- 2000 records at Skegness and Stickney, and 2001 – 2012 records around Skegness and Stickney.

108. The distances between the main clusters/ records (c.8km) would suggest that they are

associated with discrete metapopulations, which may be separated in some cases by barriers to dispersal creating distinct boundaries. For example, it is unlikely that there is genetic exchange between the metapopulation at Burgh le Marsh and any GCN metapopulations to the south due to the presence of the River Steeping and the Bell Water Drain.

109. Common toad is relatively widely recorded in the local area, whereby records returned by GLNP identified a total of 42 records within the 2km data search buffer zone. There are 17 common toad records associated with ponds within 2km of segment ECC 1 and eight records associated with segment ECC 8, but all these are outside the Order Limits. There are six or fewer records for segments ECC 4 –7, 9, 11, 12 and 14. There is only one record for Common Toad within the Order Limits, associated with segment ECC 7.

110. Smooth newt has a more scattered distribution in the local area, with only eight records returned by GLNP within the 2km data search buffer, associated with five ECCs. There are no records for smooth newt within the Order Limits.

Pond and Ditch Mapping

111. Habitats within the Study Area were initially mapped using GIS, the method for which is described in Appendix 21.2: UK Habitat Classification Survey (Document Reference 6.3.21.2). Following this, the presence of ponds was ground-truthed during the targeted GCN surveys.

112. A total of 75 ponds were recorded within the Study Area, with only eight located within the Order Limits (WM_P7; WM_P8; WM_P9; WM_P10; WM_P11; WM_P38; WM_P39 and WM_P40).

113. A total of 1046 ditches were recorded within the Study Area, with 408 located within the Order Limits.

Habitat Suitability Index Assessment (GCN)

114. The detailed methodology and results for the targeted GCN surveys are presented in Appendix 21.7: Great Crested Newt Surveys (Document Reference 6.3.21.7), a summary of which is provided in this section.

115. Of the 75 ponds and 1046 ditches within the Study Area, 53 (70.6% of total) ponds and 477 ditches (45.6% of total) were subject to HSI assessment.

116. The results of these HSI surveys are presented in Table 21.11 below, with the number of each pond and ditch meeting the criteria Poor – Excellent shown per route segment.

Table 21.11 HSI Assessment Results by Route Segment

Route Segment	Water body Type	HSI Pond Suitability Rating					**Total**
		Poor	Below Average	Average	Good	Excellent	
ECC 1	Pond	1	6	4	3	2	**16**
	Ditch	15	24	7	14	1	**61**
ECC 2	Pond	2	1	0	1	0	**4**
	Ditch	19	26	8	3	1	**57**
ECC 3	Pond	3	1	1	1	0	**6**

Route Segment	Water body Type	HSI Pond Suitability Rating					Total
		Poor	Below Average	Average	Good	Excellent	
	Ditch	5	7	2	3	0	**17**
ECC 4	Pond	1	0	0	0	0	**1**
	Ditch	9	14	5	0	0	**28**
ECC 5	Pond	4	1	0	1	0	**6**
	Ditch	18	14	17	4	0	**53**
ECC 6	Pond	0	1	0	0	0	**1**
	Ditch	13	8	5	4	1	**30**
ECC 7	Pond	1	1	0	0	5	**7**
	Ditch	10	4	8	6	0	**28**
ECC 8	Pond	0	0	2	1	0	**3**
	Ditch	19	25	19	5	1	**69**
ECC 9	Pond	0	0	0	0	0	**0**
	Ditch	10	9	4	1	0	**24**
ECC 10	Pond	0	0	0	2	1	**3**
	Ditch	6	9	2	2	0	**19**
ECC 11	Pond	1	0	0	1	0	**2**
	Ditch	4	9	7	3	0	**23**
ECC 12	Pond	1	0	0	0	0	**1**
	Ditch	3	8	9	3	0	**23**
ECC 13	Pond	0	0	0	0	0	**0**
	Ditch	7	4	5	3	0	**19**
ECC 14	Pond	2	0	0	0	1	**3**
	Ditch	0	4	0	0	0	**4**

117. Terrestrial habitats within the Order Limits are generally of poor structure, primarily consisting of flat, highly modified, arable fields which are subject to regular human use. There is minimal terrestrial habitat present suitable for foraging, shelter, dispersal, and hibernation such as woodland, scrub or tall, unmanaged or tussocky grassland. The terrestrial habitats within the Order Limits are therefore considered to be of low suitability for GCN.

eDNA Survey (GCN)

118. This section provides a summary of the detailed methodology and results for the eDNA surveys are presented in Appendix 21.7: Great Crested Newt Surveys (Document Reference 6.3.21.7).

119. The 26 ponds and 153 ditches that returned a HSI score of 0.6 (Average) or above, were targeted for eDNA survey. However due to access constraints, of these, only 19 ponds and 79 ditches were subject to detailed eDNA survey.

120. No positive eDNA results were returned for any of the ponds or ditches within the Survey Area.

121. Due to refinement of the Survey Area between the PEIR and ES stages, a number of ponds

which lie outside the refined Survey Area were subject to eDNA testing. Only one pond returned a positive result; pond 42 (WM_P42). This pond is located approximately 345m to the east of the Order Limits at segment ECC 3, and so is strictly beyond the (ES) Survey Area. However, as WM_P42 is located adjacent to Ditch 626, which runs into and across the Order Limits, and is located less than 500m away from records of GCN returned by the GLNP data search, then it can be considered that GCN found to be present within WM_P42 and the surrounding ditch network could all form part of the same metapopulation. Although the surrounding ditch network (Ditch 626 and Ditch 627) returned negative results for GCN eDNA, this network, due to its connectivity to pond WM_P42, has potential to be utilised by the local GCN metapopulation.

122. The results suggest that suitable habitats for GCN overlaps with the Order Limits in only two places; ECC 3, as evidenced by eDNA survey results, and ECC 6 as evidenced by desk study data. However, for the wider area, the surveys generally indicate that the habitats are of poor suitability for GCN.

Valuation for Amphibians

123. The desk study and field survey data suggest that GCN are present in low numbers and within relatively isolated populations in the local area. Data published by GNLP (Schofield, 2013) states that although this species is relatively abundant within Lincolnshire, there are very few records in the southeast corner of the county. Therefore, the metapopulations of GCN assumed to use pond WM_P42 (ECC 3) and Decoy Woods (ECC 6), and the nearby habitats within the Order Limits, are valued as having **local** importance.

124. There are no ponds within the Order Limits with known populations of common toad and records for this species are relatively widespread in the area. On this basis, common toad is not identified as an important ecological feature for the purposes of the ES.

125. There are no habitats within the Order Limits with known populations of smooth newts and this species is quite sparsely distributed within the area. On this basis, smooth newt is not identified as an important ecological feature for the purposes of the ES. Mitigation and avoidance measures proposed for other amphibians within the OLEMS (Document Reference 8.10) will be designed to protect all amphibian species during construction.

21.5.5.5 Reptiles

126. The detailed methodology and results of the reptile study are presented in Appendix 21.8: Reptile Habitat Suitability Study (Document Reference 6.3.21.8) and are summarised in the subsequent sections.

Desk Study

127. GNLP returned 23 records for reptiles from the Study Area, comprising the following three species of reptile:

- Common lizard – a single record, c.2km from the segment ECC 1;
- Grass snake – no records from within Order Limits, low numbers recorded across Study Area with a concentration in Frampton Marsh RSPB Reserve c.150m southeast of ECC 11; and,

- Slow worm – single record, c.300m west of ECC 11 in an area of woodland.

128. The distribution of records is shown in Figure 21.1.7.

Habitat Suitability Assessment

129. The detailed methodology for the reptile habitat suitability assessment is presented in Appendix 21.8: Reptile Habitat Suitability Study (Document Reference 6.3.21.8).

130. The approach involved assessing functionally-linked habitat mosaics, labelled as Habitat Areas 1 – 44, as shown in Figure 21.8.1 of Appendix 21.8: Reptile Habitat Suitability Study (document reference 6.3.21.8), against suitability criteria known to influence reptile presence, such as vegetation structure, topography, disturbance, and availability of refuge opportunities. Each Habitat Area was assigned a rating of 'Poor', 'Good' or 'Exceptional' in relation to suitability for reptiles.

131. Much of the Study Area (Order Limits plus a 100m buffer zone) is comprised of arable fields and modified grassland, under agricultural management, interspersed with drainage ditches of varying width and depth. Areas of neutral grassland, scrub, and several hedgerows were also recorded, albeit these were comparatively less frequent along the scheme when compared with the number of arable fields and drainage ditches.

132. The arable fields and modified grassland under agricultural management offer limited potential for reptiles due to the intensive nature of their management. A lack of wide, species rich, field margins, the scarcity of field boundaries in general, regular cultivation/ disturbance of the ground associated with the operation of farm machinery, and a monoculture approach to crop production (assumed to utilise various chemicals including pesticides) has resulted in habitat being assessed as sub-optimal for reptiles. Additionally, there is a general lack of habitat suitable for shelter and hibernation, and an assumed low prevalence of prey items (due to pesticides associated with arable land management). These habitats are assessed as having 'poor' suitability for reptiles.

133. An assessment for a typical drainage ditch and hedgerow within the Study Area was made, and both were assessed as having at least 'good' habitat suitability for reptiles, due to their common characteristics such as topography, surface substrate, likely prey abundance and connectivity.

134. The assessment of the habitat mosaic areas (Habitat Areas 1 – 44 shown on Figure 21.8.1 of Appendix 21.8: Reptile Habitat Suitability Study (document reference 6.3.21.8)) identified areas of good habitat quality within segments ECC 1 – ECC 9, ECC 13 and ECC 14.

135. The assessment identified 'exceptional' habitat for reptiles in the following segments:

- ECC 1 – Habitat Area 1;
- ECC 5 – Habitat Area 16;
- ECC 6 – Habitat Areas 22, 23, 26;
- ECC 8 – Habitat Area 32;
- ECC 10 – Habitat Areas 35, 36,

- ECC 11 – Habitat Area 37; and
- ECC 13 – Habitat Area 39.

136. With regard to grass snake, Habitat Areas 35, 36, and 37 were assessed as having particular importance, as these are directly linked to the Frampton Marsh RSPB reserve, where this species has been recorded. It is considered very likely that grass snake are present within Habitat Area 39 also, due to habitat quality in this area and connectivity to historic records via the River Welland, which likely act as a corridor for dispersal for this species.

137. Habitat Area 1 is directly connected by coastline scrub habitat to the location of the only record for common lizard returned by the desk study and has been assessed as offering 'exceptional' habitat quality for reptiles, particularly for common lizard. This area is considered to contribute to a large habitat unit / matrix which supports a larger metapopulation of common lizard in suitable habitats along the coast. It is considered that Habitat Area 1 could also support other native species of reptiles.

138. Regarding slow worm, a single record for slow worm was returned from outside the Study Area and from an area not linked to it by suitable habitat. However, several woodland and scrub habitat areas which made up 'good' and 'exceptional' mosaic areas were identified within the Study Area which were considered likely suitable to support populations of the species.

Valuation for Reptiles

139. An atlas for Lincolnshire and South Humberside (Johnson, M., 1982) contains data on the distribution of common reptiles, based on surveys undertaken between 1975 and 1978. Although historic, in the absence of a more up-to-date source, it gives an indication of species distribution across the county, acknowledging the general decline in populations of common reptiles within the UK especially arising from intensification of agriculture. The distribution map for grass snake, indicates that records for this species were common and widespread within at least the central part of the county at that time, but almost absent in the southeast corner (in the area surrounding the Project). The distribution maps for both common lizard and slow worm records indicate that records for these species were very scarce and scattered within the County, and, like grass snake, absent from the southeast corner.

140. Grass snakes utilising habitats within the Order Limits are likely to have ranges that extend beyond it. Grass snake have large ranges (between 1.29 and 3.56ha according to research by Reading & Jofré, 2009) and this species typically use ditches, streams, drains and rivers to commute through the landscape. Therefore, grass snakes occurring within the Order Limits are assessed as part of the populations associated with a wider area and likely to use ditches, streams and drains within the Order Limits for commuting to more valuable habitat areas. As grass snake population(s) associated with the southeast of the county are scattered, and the habitats within the Order Limits are principally considered valuable for connecting the home ranges of grass snakes, the population of grass snake using the Study Area are assessed as having **local** importance.

141. Common lizard and slow worm are assumed to be present in suitable habitat within the Order Limits. Although they have small ranges and are unlikely to contribute genetically to

populations much beyond the Order Limits, given the scarcity of records in the local area returned by the desk study, and the historic scarcity of records of these species within Lincolnshire, both are assessed as being of **county** importance.

21.5.5.6 Bats

142. The detailed methodology and results of the bat study are presented in Appendix 21.4: Bat Surveys (Document Reference 6.3.21.4) and are summarised in the subsequent sections.

Desk Study

143. The GNLP returned one record of a brown long-eared bat roost, recorded in 2011 and one record of an unidentified pipistrelle bat species recorded in 2016 was returned from within 5km of the Order Limits. A search of MAGIC EPSL records also returned five licence records from within 5km of the Order Limits, dated between 2012 and 2016, and covering day roosts for common, soprano and Nathusisus' pipistrelle (*Pipistrellus nathusii*), and maternity roosts for common pipistrelle or brown long-eared bats (although not possible to tell which from MAGIC data).

144. Other (non-roost) records were returned for the area of search for brown long-eared, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Pipistrellus sp., Daubenton's (*Myotis daubentonii*), Myotis sp., noctule, Nyctalus sp. and Western barbastelle (*Barbastellus barbastellus*).

Field Survey

145. Field surveys for bats, including tree PRA surveys, presence / absence surveys on trees and static and walked transect survey were undertaken on accessible lands within the Order Limits.

146. No buildings were located within the Order Limits. Ten buildings were located within 25 m of the Order Limits, and these were subject to PRA to determine roost suitability. Three of the buildings within 25 m are assessed as having Moderate suitability and seven had Low suitability.

147. Of the 146 trees within the Order Limits, 40 were subject to bat roost suitability assessment, the remainder (a total of 12) were either too small to require assessment or could not be accessed. Three trees were identified within the Order Limits as having Moderate or High bat roost suitability (Trees 3767 and 1095 moderate, and Tree 4954 High), along 14 trees with Low suitability and 117 trees of Negligible suitability.

148. Presence/ absence surveys detected a possible re-entry by a single common pipistrelle bat for Tree 1095. No other bat roosts in trees were identified within the Order Limits, although access and seasonal timing constraints prevented surveys of Trees 3767 and 4954.

149. Static and transect data indicated low levels of bat activity on the site with a total of eight species recorded using the site including barbastelle, Nathusius pipistrelle, common pipistrelle, soprano pipistrelle, myotid bats, brown long eared, Noctule and Leisler's bat.

Valuation for Bats

150. Habitats within the Order Limits were assessed as Moderate suitability for bats consisting principally of modified and neutral grassland (c.10% total land area), and cropped fields divided

by well-established hedgerows (up to 5,965m), ditches, and dykes.

151. A small number of trees are within close proximity of the Order Limits and none of these have been confirmed to contain bat roosts.

152. Bat activity on the site was considered to be low, transect surveys only identified 1,500 bat passes over the whole year of transect surveys.

153. Static detector 63 recorded a peak of 15,000 common pipistrelle bat call registrations during the month of August.

154. Static detectors identified an increase in Nathusius pipistrelle activity, recorded at Static location 43 in October.

155. As there are no bat roosts or specific populations of bats that have been identified as important during the baseline studies, it is proposed to value the bat assemblage (potential roosting, foraging and commuting habitat) collectively at **Local** value, noting the conservation importance of bats in general and their legal protection.

21.5.5.7 Badger

Desk Study

156. GNLP returned just over 400 records of badger from within the Study Area, of which only three originated from within the Order Limits, and all three were records of badgers found dead on the road. In 2007, two badgers in ECC 1: Landfall to A52 - Hogsthorpe and in 2009 two badgers ECC 4: A158 Skegness Road to Low Road.

Field Survey

157. Field surveys for badgers were undertaken on all accessible land within the Order Limits plus a 100m buffer (the Survey Area) between November 2022 and October 2023. These are described in full in the Confidential Appendix 21.5: Confidential Badger Desk Study and Field Survey (Document Reference 6.3.21.5). The predominantly arable habitats within the Survey Area were assessed as generally suitable for badgers, providing opportunities for sett creation and foraging, with low levels of anthropogenic disturbance.

158. Within the Survey Area, 98 badger setts were recorded, with 14 of these located within the Order Limits. The majority of setts and field signs were recorded along linear features, such as field boundaries, ditches and hedgerows.

159. Badger setts were recorded in all segments except ECC 4, which is a comparatively small section where field signs were recorded relatively infrequently.

160. The greatest numbers of setts were recorded in ECC 11 (30 setts recorded) and ECC 12 (17 setts recorded), which correlates with the highest recordings of other field signs, indicating the land within these segments is more intensely utilised by badgers.

161. Main setts were recorded across the Survey Area, with a total of 50 recorded within the Survey Area and five within the Order Limits.

162. In addition to setts, evidence of badgers, such as latrines and footprints, was recorded in

118 locations, and at 38 locations within the Order Limits.

163. The results indicate that the Survey Area contains multiple social groups of badgers with territories relatively close together.

164. The fairly even distribution of setts and field signs across the Survey Area indicates that badgers utilise all land within the Order Limits.

Valuation for Badger

165. The desk study results indicate that badger are common and widespread in at least the local area. Badgers are listed as a species of 'least concern' by the IUCN and are widespread in the UK and Europe. The size of the UK population is unknown, but there is a published estimate of 485,000 individuals in the UK (Judge, J. *et al*., 2017) and 64,000 social groups in England and Wales (Defra, 2014). Evidence suggests that the national badger population trend is an increase in population size. Given that badgers are common and widespread locally and nationally and population trends are increasing, the badger population within the Order Limits is assessed as being of **site** importance only.

166. The guidance (CIEEM, 2018 (updated 2022)) states that protected species should be considered IEFs (and therefore progressed through the assessment) if there is potential for a breach of the legislation. As badger setts are present within the Project Order Limits it is assumed at this stage of the assessment that they could be impacted, and on this basis, badgers are carried forward into the assessment.

21.5.5.8 Otter

167. The detailed methodology and results of the riparian mammal surveys are presented in Appendix 21.6: Riparian Mammal Surveys (Document Reference 6.3.21.6) and the results for otter are summarised in the subsequent sections.

Desk Study

168. GLNP returned one record of otter from within the Order Limits and 92 records from within the Study Area . The results can be found within Figure 21.1.12 in Appendix 21.1: Onshore Ecology Desk Study (document reference 6.3.21.1). The otter record from within the Order Limits, dates from 2015 and was located at ECC 13. Outside the Order Limits, the largest number of otter records were located near to segment ECC 6, with a total of 20 records.

Field Survey

169. Habitats within the survey area which were assessed as having potential to support otter including the surface water ditch network, some of which has moderate suitability for otter, and the six main rivers within the Order Limits.

170. Holts were recorded at ECC 14 and ECC 10. A couch was recorded at ECC 3 and a slide was recorded at ECC 5. Otter footprints were recorded within segment ECC 14 and ECC 13.

171. Otter feeding evidence constituting bivalve remains were recorded at ECC 2, ECC 5 and ECC 10.

Valuation for Otter

172. The desk study results indicate that otter are well recorded in the Study Area, with data from the last (5th) National Otter Survey (Environment Agency, 2010) indicating that this species was present within most watercourses and expanding its range in the Louth Coastal catchment and the Witham Catchment that coincide with the Order Limits.

173. Otter utilising habitats within the Order Limits are very likely to have ranges that extend beyond it and are assessed as part of the populations associated with a wider area. As such the population of otter using the habitats within the Survey Area are considered to be of **local** importance.

21.5.5.9 Water Vole

Desk Study

174. GLNP returned 38 records of water vole from within the Order Limits. Over 2,000 records of water voles were returned from within the Study Area. The results can be found within Figure 21.1.12 in Appendix 21.1: Onshore Ecology Desk Study (document reference 6.3.21.1).

175. The majority of water vole records returned from within the Order Limits were within segment ECC 5, with a total of 16 records during 2007-2019. Outside the Order Limits, the largest number of records were returned near to segment ECC 2, with a total of 455 records.

Field Survey

176. Habitats within the survey area which were assessed as having potential to support water voles include the surface water ditch network and ponds, some of which have moderate suitability for otter, and the six main rivers within the Order Limits.

177. Two different sightings of an individual water vole were recorded during the surveys at ECC 10 and ECC 7.

178. Water vole footprints were recorded at ECC 7.

179. Feeding stations / remains were recorded in ECC 1, ECC 5, ECC 7 and ECC 10, with the highest number (74) recorded in ECC 10.

180. A total of 71 water vole burrows were recorded, in all segments except ECC 13 and 14, with highest counts in ECC 5, 7, 10 and 12.

Valuation for Water Vole

181. The water vole recorded living within and using habitats within the Order Limits are likely to form part of adjacent populations within the wider area. Records of this species are abundant in the local area (within the 2km Desk Study area) and the LBAP (3rd Edition, Lincolnshire Biodiversity Partnership, 2011-2020) describes the species as stable and widespread at the county level at the time of writing. As such the population of water voles using the habitats within the Survey Area are considered to be of **local** importance.

21.5.5.10 Other Terrestrial Mammals

182. Other evidence or records of mammals included brown rat (*Rattus norvegicus*), common shrew (*Sorex araneus*), brown hare (*Lepus europaeus*), rabbit (*Oryctolagus cuniculus*) and roe deer (*Capreolus capreolus*).

183. Evidence of brown rat included individual burrows, droppings and prints at ECC 4, ECC 7-11 and ECC 13. These were found on the field margins of arable land, rather than within waterbodies.

184. Evidence of common shrew was an individual sighting at ECC 13. Again, these were found on the field margins of arable land, rather than within waterbodies.

185. Hares were recorded incidentally across the Order Limits during many site visits, occasionally in large numbers (estimate of 25 individual hares in one field). Evidence of hares were potential individual forms found at ECC 1. These were found on field margins of arable land.

186. Evidence of rabbits included visual sightings of individuals and individual burrows found at ECC 1, ECC 2 and ECC 11. These were found on field margins of arable land.

187. Evidence of roe deer were footprints recorded at ECC 10. These were found within an arable land parcel.

188. The brown hare is a Species of Principal Importance in England, listed under Section 41 of the NERC Act, although it was removed from the most recent LBAP (2011 – 2020) on account of Lincolnshire being a stronghold within the UK and the widespread distribution of this species within the county. As brown hare are not considered a local priority for conservation, this species is not taken forward into the impact assessment.

189. None of the other terrestrial mammals recorded within the Order Limits or wider ZoI of the Project are threatened or especially vulnerable and only common shrew is protected under the WCA1981 in relation to live trapping (all native mammals are offered some welfare protection under the Wild Mammals (Protection) Act 1996). On this basis, other terrestrial mammals are not taken further as IEF in this assessment.

190. Measures are presented within the OLEMS (Document Reference 8.10) to minimise potential negative impacts on other mammals during site preparation and vegetation clearance.

21.5.5.11 Invasive Non-Native Species

191. No records were returned from GLNP of invasive non-native species (INNS) from within the Order Limits, and no presence of any INNS were identified during the habitat surveys (see Appendix 21.2: UK Habitat Classification Survey (document reference 26.3.21.2). Therefore, INNS are not identified as an IEF within this assessment. Consideration of control and prevention of spread or contamination with INNS is included within the OLEMS (Document Reference 8.10).

21.5.6 Limitations

21.5.6.1 Design Stage

192. There are a number of limitations of the design stage of the Project that have influenced the approach taken in the assessment. For example, the design does not include visual splays which will be required where project traffic routes, such as the construction haul road, interact with the existing road network. It is likely that any woody vegetation will be coppiced or managed as required to create visual splays for safety reasons. Any mitigation required will be captured through pre-construction surveys as required by the OLEMS, and an update the Ecology Management Plan (EMP) where required.

21.5.6.2 Access for Field Surveys

193. The Project covers a considerable footprint with a large number of different landowners and under a range of land management, principally arable and pastoral land. Due to the complexity of land ownership, access was not always available to land parcels at the times needed to optimise surveys. Access constraints limited some of the field work, including the survey timing and the extent of UKHab surveys and species surveys.

194. These limitations are not considered to be major constraints or to have adversely affected the results of the onshore ecology survey effort and the subsequent assessment that has been completed; however, they have been presented for completeness. Furthermore, pre-construction surveys would be undertaken, and these are outlined in the OLEMS (Document Reference 8.10).

21.5.6.3 Important Hedgerows

195. Part of the hedgerow survey was carried out in winter in conjunction with the UK Habitat Classification survey and due to alterations to the red line boundary, which would be considered a sub-optimal time of year for conducting surveys for woodland flora, with the optimal time being spring. Though some species of ground flora may have been missed, it is considered that due to winter tree and twig distinguishing characteristics sufficient information has been collected to robustly classify the woody species of the hedgerows within the Survey Area. In addition, all hedgerows assessed as not being 'important' were classified as such based on the low number of woody species, removing them from consideration before requiring consideration of ground flora present as an assessment tool.

196. Sufficient field surveys were undertaken to inform hedgerow data in the majority of instances. For a small number of hedgerows (Hedgerows 1505, 1506, 1507, 1823 and 1836), an assessment of their importance cannot be provided as a full data set was not obtained.

197. Where sufficient data to complete a hedgerow regulations assessment was not available, a precautionary approach has been adopted and the hedgerow has been assumed to be 'important'.

21.5.6.4 Fish

198. Due to safety concerns, ecologists were not permitted to enter any intertidal zone. All intertidal zones were assessed from the banks only. Drainage systems were investigated, although due to the gradients and water depth, ecologists were not permitted to enter, and

assessments were again made from the banks where access was permitted.

199. No specific surveys for fish species were undertaken. However, due to the underground installation of the cable beneath the watercourses studied, no suitable fish habitats with the potential to be significantly impacted by the Project were identified.

21.5.6.5 Amphibians

200. Access to some ponds and ditches was not possible due to landowner access limitations, the presence of livestock, or occasionally the ponds being present within private residential gardens.

201. During the eDNA surveys, there were a small number of instances where water samples taken from ditches were contaminated with dissolved chalk. Where contamination occurred, the survey was repeated with water sampled using a chalk filter unit and syringe. This approach to water sampling minimised the risk of the contamination of water samples influencing the efficacy of the eDNA laboratory test.

202. Much of the ditch network located along the route and several of the ponds had dried up during May-June 2023. This meant that eDNA surveys could not be carried out on some of the ditches with 'average' HSI scores or above. However, this is not considered to be significant limitation or to alter the results of the assessment as the ponds were dry, meaning they would be unlikely to support GCN if they dry up regularly during the summer breeding season.

203. For any HSI assessments undertaken outside of the recommended macrophyte survey season (May-end of September), a precautionary survey approach for macrophyte percentage was used. For ditches (holding water), a precautionary 30% was applied, whilst for ponds (holding water), the highest percentage score recorded on site was used.

204. Some ponds and ditches were subject to a HSI assessment after the close of the eDNA survey period (30th June 2023), therefore those which received an Average or above HSI score would not have been subject to an eDNA survey. A total of 28 such ditches resulted in an Average score or above. There were no accessible ponds scoring Average or above. The absence of eDNA results for these ditches is not considered to constrain the data significantly as only a small proportion of the total within the Survey Area were subject to a late HSI assessment.

21.5.6.6 Bats

205. The bat surveys provide a snapshot of bat presence at the time of their undertaking. Tree roosting bats in particular are known to frequently move between roost sites. Consequently, the bat survey has not sought to pinpoint every roost, but instead to provide sufficient survey effort to understand the bat population present and inform the impact assessment.

206. During the surveys, access to most land parcels was available. However, there were some exceptions where access was restricted for certain parcels preventing survey. In addition, the red line boundary was expanded, following completion of field survey work, to include addition visual splays, and the 400kV cable corridor connecting the OnSS to the Connection Area. Although some of this infrastructure is unlikely to impact on potential bat roosts or other habitat (the enabling access tracks for example), some could, and the absence of baseline data

in these areas presents a slight limitation to the assessment. However, it is important to note that such areas represent a very small proportion of the habitat within the Order Limits, and given the survey effort expended, and methods used in the wider site, it is considered that these minor limitations do not constrain the overall characterisation of the baseline with regard to the bats populations present, or the assessment of impacts on those populations. Mitigation presented would ensure any trees removed would be subject to pre-construction surveys and would prevent impacts to individual bats/ roosts.

Preliminary Roost Assessment of Trees

207. The National Tree Map data is a useful tool but is not a perfect dataset, containing some limitations such as misidentifying large bushes and remnants of hedgerows as trees, and conversely missing some trees altogether. Field surveys were undertaken to assess the roosting potential of individual trees, although a small proportion of trees could be reached. Access constraints meant that a PRA could not be undertaken for tree numbers 4407, 4409, 4015 in ECC 12 and 5870, 5875, 5876, 5880, 5881, 5883, 5887, 5888 and 5890 in ECC 14. This is considered a minor constraint, which will be rectified during pre-construction surveys.

Presence/ Absence Surveys

208. Presence/ absence surveys were conducted within the Order Limits, predominantly under appropriate weather conditions, although short periods of drizzle were experienced during a small number of survey sessions. Although drizzle may have influenced the observed bat numbers, it is important to highlight that bats in flight were consistently observed during any such surveys. No other weather-related limitations were recorded.

209. After the publication of the interim guidance note by the BCT (2022) night vision arrays (NVA's) were not readily available at the quantities required on a national level due to the rapid surge in demand. This limitation was partially addressed through the use of dawn surveys which while not perfect does address some of the limitations with visual identification of roost sites, particularly in trees.

Bat Activity Surveys

210. The initial habitat data was evaluated using BCT Guidelines and the habitats present evaluated to be of 'low' quality for commuting and foraging bats. In line with the BCT Guidelines for low quality habitats, the activity surveys were initially designed to include a repetition of the transects every season (i.e. each transect would be walk on three occasions; once in Spring, once in Summer and once in the Autumn. However, following the release of an alternative route option, it was determined that the activity survey effort needed to be enhanced in June 2023. This decision was made to factor in the improved quality of habitats found on the new land parcels included in the alternate route option (known as 'route north of the A52' in the PEIR). Consequently, activity survey data was not gathered for April and June 2023, but was successfully collected for the months of May, July, August, September, and October.

Manual Bat Activity Surveys

211. Bat activity transect survey design was based on the PEIR Boundary, rather than the Order Limits. In May 2023, surveys began on 15 transects along the PEIR Boundary. The Project red line boundary was later refined during the bat transect survey season and, in response, the number of surveyed transects was reduced to a total of 11 (with Transects 2, 3, 7 and 8 removed). Data for the removed transects can be made available upon request.

212. In a small number of cases, minor changes to the transect route were required where land access availability differed between survey months (for example, where bulls were moved into a field). Consequential changes to transect routes were minimal, for example, walking along the opposite edge of the same field. These minor changes are not considered to significantly affect the validity of the transect data. and will not significantly affect the overall reporting of bat activity.

213. During some of the transect surveys, the bat detectors lost GPS signal and therefore were not able to geo-reference every bat call. Where possible, this was rectified through the use GPS data gathered in the ArcGIS Field Maps application on tablets also utilised during the transects.

Automated Bat Activity Surveys

214. Bat activity transect survey design was initially based on the PEIR Boundary, rather than the Order Limits. In May 2023, statics were deployed at 66 locations inside the PEIR Boundary. The Project red line boundary was later refined during the static survey to exclude the Lincolnshire Node route and an alternative cable route option to Weston Marsh. In response, Statics 3-9 and 26-39 were excluded from the survey schedule, as they were deemed outliers. The data sets pertaining to these statics can be provided on request. The remaining 45 statics all fall within a 500m radius of the Order Limits, and comprehensive data sets were successfully obtained for these locations.

215. Some static detector deployment occurred at the end of September to October resulting in the data collected originating from the end of September rather than the beginning of October. However, bat behaviour would not be expected to vary significantly over a few days and this is not considered to have constrained the characterisation of the baseline.

216. All Static detectors used were georeferenced to ensure repeat deployment of the detectors was possible. In some situations, the detectors were repositioned to address unforeseen circumstances such as cropping of the fields or an absence of suitable anchor points. In such instances the locations selected were as close to the original as possible to maintain consistency.

217. Several static detectors were stolen during the automated bat activity survey, this is considered an unavoidable constraint.

218. One detector malfunctioned, which compromised the recoding of survey data at one location, however due to the elevated survey effort employed on the Project overall, this is not considered to be a significant constraint.

Data Analysis

219. Kaleidoscope Pro only attribute one species label to a sound file, even if more than one bat species was recorded on that file. During manual verification checks on 2% of the unidentified bat calls, where multiple bat species were recorded on a single recording the records were manually updated. This is not considered to affect the conclusions of this report; the number of bat passes does not relate to the number of bats present in any one location.

21.5.6.7 Badger

220. Badgers move between setts within their territories in response to environmental factors such as availability of seasonal food resources, human disturbance, accumulation of parasites, or territoriality. Therefore, setts recorded as inactive may come back into use, and new setts may be excavated in previously unoccupied areas, and the survey data collected represents a 'snap-shot' in time. This Chapter presents mitigation measures that include pre-works update surveys in order to overcome this constraint.

21.5.6.8 Otter and Water Vole Surveys

221. A total of 37 waterbodies could not be visited due to permission to access the land not being granted. Access was also not available to waterbodies within private gardens.

222. A close inspection of some ditches was restricted by dense vegetation or steep banks which prevented full access and in such areas water vole and otter presence could not be completely ruled out. To minimise this limitation, surveyors used binoculars to view banks at distance and searched stretches of ditches up and down stream. The survey coverage achieved is considered adequate for the purposes of informing the impact assessment.

223. Although not all waterbodies could be surveyed, the survey effort was sufficient to establish the presence of otters within the Survey Area. Otters are likely to occur on water bodies that could not be surveyed where suitable habitat is present as otters are highly mobile and range over large areas. However, the areas which were not accessible were covered by the ecological data from other survey types (including initial habitat assessments, UK Habitat Classification, habitat suitability index assessment for great crested newt and presence/ absence surveys for GCN), which, combined with the ability to characterise from the data collected in the remainder of the survey area, is considered sufficient to inform the impact assessment.

The lack of positive field signs does not preclude the confirmation of riparian mammal presence and precaution was adopted in the field work and data analysis to account for this. Given the good survey coverage and survey results which reflect the GLNP data set, this is not considered to be a significant limitation to the survey's findings.

21.5.7 Future Baseline

224. In the 'Do-nothing' scenario, the future baseline is considered likely to be very similar to the current baseline, as there is unlikely to be a significant reduction in the area of land required for food production or a change in the way arable land is managed. However, it is acknowledged that baseline ecological conditions could change as a result of land use policy, environmental improvements and development pressures. There may also be some changes to

the baseline over time as a result of natural variation and weather events.

225. Climate change is also predicted to result in complex changes to biodiversity. Of most relevance at the Project location is that coastal habitats that cannot respond to sea level rise or coastal erosion by moving inland (for example, due to the presence of urban land or flood defences) are anticipated to be lost.

21.5.8 Summary of Important Ecological Features

226. Table 21.12 below sets out a summary of IEFs identified as having local or above importance and selected for progression through the impact assessment.

Table 21.12 Important Ecological Features progressed through the Assessment

Geographical Frame of Reference	Description of Ecological Feature important at this scale (IEF)	Summary Reason for Importance	Location
International	Designated sites (see Table 215)	SAC – European designated sites	Outside order limits, approximately 0.2km away at nearest point
National	Designated sites (see Table 215	SSSI / NNR	Outside order limits, but nearest immediately adjacent.
County	Designated sites (see Table 216	LNR – County LWS – County	Within Order Limits
County	Coastal sand dunes, saline lagoons, coastal saltmarsh, grazing marsh, hedgerows and trees.	Lincolnshire BAP Habitats	Within Order Limits
County	Reedbed (f2e) Standing water (Priority Ponds) (r1 19, r1a 19) Sand dunes (s3a)* Coastal saltmarsh and inter-tidal mud flats (t2a and t2d) Coastal floodplain grazing marsh (g~ 25) Rivers (r2) and Estuaries (r~ 30, t~30)	Priority habitats identified in UKHab survey report, typically semi-natural and long-established habitats with potential to support flora and fauna of ecological value at county scale. Habitats marked with an (*) are also considered to be “irreplaceable habitats”	Within Order Limits
Local	Priority Hedgerows (h2a)	Widespread, recently created or easily	Present within Order Limits.

Geographical Frame of Reference	Description of Ecological Feature important at this scale (IEF)	Summary Reason for Location Importance	
	Arable field margins (c1a and c1a5)	recreated linear Priority habitats identified in UKHab survey report	
National - Local	Invertebrate assemblage –	See report for full details of the habitats with potential for invertebrate interest	Within the Order Limits
Local	Amphibians (Common Toad Smooth Newt and GCN)	Widespread species, common toad, smooth newt and GCN are Priority species. GCN has a scattered distribution and is legally protected under the Habitats Regulations	Two metapopulations of GCN overlapping Order Limits.
County	Common lizard and slow worm	All native reptiles in UK are protected under the WCA1981. Grass snake Common lizard and slow worm are Priority species.	All species are sparsely distributed in suitable habitats within and in proximity to the Order Limits.
Local	Grass snake	All native reptiles in UK are protected under the WCA1981. Grass snake Common lizard and slow worm are Priority species.	Grass snake is sparsely distributed in suitable habitats within and in proximity to the Order Limits.
Local	Bats	All bat species are protected under the WCA1981 and the Conservation of Habitats and species regulations 2017	Low levels of bat activity recorded throughout the order limits with localised seasonal peaks of activity.
Local	Otter	Otters are protected under the Wildlife and Countryside Act 1981, the Conservation of Habitats and Species Regulations 2017 and are a Species of	Evidence of otter sparce but across the Order Limits associated within suitable surface water features.

Geographical Frame of Reference	Description of Ecological Feature important at this scale (IEF)	Summary Reason for Location Importance	
		principal importance in England.	
Local	Water vole	Water vole are protected under the WCA1981 and are a Species of principal importance in England.	Widespread within the Order Limits on suitable surface water features.
Local	Eel	Eel are protected under the Eels Regulations 2009.	Potentially migrate along the River Welland and Haven.

21.6 Basis of Assessment

227. The Project design has been fixed for the purposes of this assessment using the information presented in Table 21.13 below. The approach taken has been to consider a "maximum design scenario" and therefore ensure that the assessment of impacts and proposed mitigation measures are precautionary, but proportionate to the proposed activities. In the event that the Project deviated substantially from the design parameters set out in Table 21.13below, a re-assessment may be required.

228. The scope of the assessment has been informed by both national and local planning policy and guidance, established best practice and experience, as well as via the consultation process with relevant consultees.

229. Following receipt of the Scoping Opinion from The Planning Inspectorate (The Planning Inspectorate, 2022), there were impacts agreed to be scoped out of the assessment, however others which required further consideration. The impacts scoped in and out of the assessment are detailed below, with further information or justification, where required.

21.6.1 Impacts Scoped In

230. During the scoping phase of the assessment, a range of potential impacts on Onshore Ecology were identified which could occur during the construction, operation and maintenance, and decommissioning phases. In line with the Scoping Opinion (The Planning Inspectorate, 2022), it was agreed that the majority of impacts would remain scoped into the assessment until further Project design details became available. These potential impacts remained unchanged at the PEIR stage, as baseline data collection was ongoing and the design detail was not sufficient to revise them.

231. However, now that the Order Limits are fixed, and the type and duration of construction and operational activities planned within it is more clearly defined, it has been possible to more accurately define the geographical extent over which impacts and associated effects arising from these activities will occur.

232. Additionally, impacts have been re-ordered to assist with ease of assessment and to avoid repetition and the risk of 'double-counting' impacts.

233. Following refinement to the Project design and collation of a robust ecological baseline, at the current stage of reporting the following potential impacts are relevant:

- Construction:
  - Impact 1: Indirect impacts on designated sites, including:
    - Water quality impacts affecting designated sites hydrologically connected to the Project;
    - Air quality impacts affecting designated sites;
  - Impact 2: Permanent loss of habitats, including irreplaceable and priority habitats, including:

- Any damage to / loss of irreplaceable habitats;
- Impacts on priority habitats within the Order Limits arising from vegetation clearance and site preparation works within permanent works areas;

- Impact 3: Temporary loss of, or damage to, priority habitats, such as:
  - Impacts arising primarily from vegetation clearance and site preparation works within temporary works areas;
  - Impacts arising from pollution or contamination arising from construction activity;
- Impact 4: Impacts on protected and priority species including populations of rare arable weeds, such as:
  - Killing, injury/damage and disturbance;
  - Damage to supporting habitat arising;
  - Isolation and fragmentation arising from habitat loss;
- Impact 5: Spread of INNS.

- Operation and maintenance:
  - Impact 6: Disturbance of protected and priority species during maintenance works.
- Decommissioning:
  - Impact 7: Impacts similar to construction, but more limited in geographical extent and timescale with no permanent habitat loss.

234. Details surrounding the decommissioning phase are yet to be fully clarified. In addition, it is also recognised that policy, legislation and local sensitivities evolve, which may limit the applicability of this assessment at that future time.

235. Decommissioning activities are not anticipated to exceed the construction phase worst case, as assessed, given that Landfall and cable infrastructure is expected to be left in situ.

236. The decommissioning methodology would be finalised nearer to the end of the lifetime of the Project, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Furthermore, the DCO will include requirements for the submission of decommissioning programmes.

21.6.2 Impacts Scoped Out

237. Impacts were scoped out of the assessment in line with feedback provided through the Scoping Opinion (The Planning Inspectorate, 2022), Section 42 responses and further consultation through the EPP. The assessment's scope was also based on the receiving environment and expected parameters of the Project (see Chapter 3 (Document Reference 6.1.3)), the expected scale of impact and the potential for a pathway for effect on the environment.

238. One potential impact included at the Scoping/ PEIR stage has been scoped out following confirmation of further project design details. This is a construction phase impact associated with direct loss of habitats within designated sites, local nature reserves, local wildlife sites, and other nature reserves within and surrounding the Order Limits. The onshore Order Limits has been designed to avoid designated sites. Where the boundary overlaps with these, the project has committed to avoid damage through the use of trenchless techniques.

21.6.3 Realistic Worst-Case Scenario

239. The Maximum Design Scenario (MDS) for Onshore Ecology identified in Table 21.13 has been selected as having the potential to result in the greatest effect on an identified receptor or receptor group. The MDS takes into consideration avoidance of impacts by design and the use of trenchless techniques.

240. The Maximum Design Envelope is outlined in Chapter 3 (Document Reference 6.1.3) and the following parameters are supported by Figure 3.4 Indicative Onshore Infrastructure (Document Reference 6.2.3.4).

241. This figure outlines the indicative infrastructure layers as well as associated IDs that have been assigned to each infrastructure element for reference throughout this chapter and the ES. Where an ID is relevant to this figure it is presented in square brackets e.g. [PCC-1].

Table 21.13 Maximum Design Scenario for Onshore Ecology

Potential effect	Maximum design scenario assessed	Justification
Construction		
Impact 1: Indirect impacts on designated sites	There is potential for the project to negatively impact air quality and some ecological receptors during cable installation, construction of temporary and permanent infrastructure and the final removal of plant form the site. Construction dust can smother species and lead to changes to the chemical composition or the receiving environment. Road traffic emissions generated during the construction phase have potential to negatively impact on sensitive ecological receptors. Decommissioning phase traffic movements and other works could also lead to impacts.	It has been assumed that there is potential for air quality impacts on important ecological sites due to the proximity of some sites to the Order Limits.
Impact 2: Permanent loss of habitats, including irreplaceable and Priority habitats	Trenchless techniques will be used to avoid direct impacts on all IDB (IDB) drains, Environment Agency Main Rivers and areas of Priority Habitat within the Order Limits. Permanent habitat loss associated with the Order Limits is limited to the OnSS, mitigation landscape planting, permanent access roads, and Link Boxes (manhole covers at the link box sites and TJBs) along the onshore ECC and 400kV cable corridor, with a maximum total of 36.48 ha loss (including all habitat types). Within the Landfall Compound [PCC-1] there will be up to six TJBs, (four planned allowing for two failures). Each active TJB site will have a maximum permanent footprint of 8m^2 (2x manhole covers (each 4m^2) per TJB). There will be 700 Joint Bays and associated link boxes along the onshore ECC and 400Kv cable corridor, each having a permanent footprint of up to 4m^2. This will lead to a maximum associated permanent habitat loss including those at the TJB sites of 2,824m^2 (0.28 ha). The locations are not fixed within the design at present. The loss of 0.28 ha is accounted for in the overall loss of 36.48 ha.	It has been assumed that there is potential for permanent loss of Priority habitats as these have been recorded within the Order Limits.

Potential effect	Maximum design scenario assessed	Justification
Impact 3: Temporary loss of, or damage to, habitats including Priority habitats	Temporary habitat loss associated with the onshore ECC and 400kV cable corridor during construction includes all land within the onshore Order Limits used for open trenching techniques, temporary compounds, construction haul roads. The onshore ECC comprises a typically 80m working width, albeit that the corridor widens at landfall, major crossing locations and at the OnSS. The 400kV cable corridor is typically 60m working width. All habitats temporarily lost will be reinstated on a like for like basis. Where those habitats have been identified as having important ecological functionality, they will be enhanced in line with the commitments presented within the Outline Landscape and Ecological Management Strategy (OLEMS) (document reference 8.10). For example, (e.g. a hedgerow may be replaced with greater species diversity, more standard trees, and an enhanced management regime). Areas where works are not due to take place will be left undisturbed until Year 2, rather than stripping the entire corridor in Year 1. Approximately 1/3 of the ECC will remain unstripped during the winter of construction year 1. To enable pre-construction works temporary access routes extending away from the onshore ECC and linking it to the existing road network will be installed. These enabling access routes will be utilised for a maximum duration of two months and their purpose is to enable machinery to be taken into the site for temporary compound construction and construction of the haul road sections. Once the construction of the haul road is finished, this will, in most instances, be the primary route for construction traffic and the enabling access routes will be taken out of use. With regard to the enabling access routes, no modification to the existing ground surface will be made, tractors being used to mobilise equipment on trailers will be able to cross the largely arable landscape without the need for new roads/ surfacing. Some vegetation clearance may be required. It is anticipated that routes will be micro-sited where practicable within the order limits where an ecological constraint exists, to avoid damage to important habitats and to minimise risk to protected species. For example, it will be possible for routes to avoid badger setts and bat roost trees (if present). These measures for avoidance are set out in the OLEMS (Document Reference 8.10).	It has been assumed that there is potential for temporary loss of Priority habitats as these have been recorded within the Order Limits.

Potential effect	Maximum design scenario assessed	Justification
	Minor vegetation clearance may be required for the enabling accesses which will be used to transport construction machinery onto site at the beginning of the construction phase. It is assumed that vegetation will be cleared and soil stripped from the areas proposed for open trenching works, temporary construction compounds, the onshore substation OnSS and the sections of haul road. The underground trenchless crossing sections (between the entry and exit pits) will not be subject to temporary habitat loss as there will be no physical impact to above ground habitats, except, in some instances, for the footprint of the haul road. Most of the onshore ECC & 400kV cable corridor will be installed using an open cut method. The cable ducts will be installed in separate trenches (typically up to four trenches, each containing one cable circuit[5]). Each trench will be 1.5m wide at the base, 5m wide at existing ground level.[6] The trenches will be excavated using a mechanical excavator, and the export cables will be installed into the open trench from a cable drum delivered to site. The remainder of the trench is then backfilled with the excavated material. The stored topsoil will then be replaced and the surrounding land reinstated back to its previous use. The haul road will typically be 6.8m wide (and up to 9m at passing places) including verges and drainage channels, and will run centrally, with a pair of cable trenches either side, and soil bunds comprising arisings from trench excavation constructed beyond and parallel to these. The soil bunds will be managed in line with the Soil Management Plan. The haul road will be culverted where it crosses ordinary watercourses and it is assumed that for each culvert an 8-10m stretch of watercourse/ bankside would be temporarily lost. The haul road will result in a maximum temporary loss of up to 41.45ha, directly affecting terrestrial and aquatic habitats.	

[5] At major trenchless crossings, more ducts may be required, and the cable circuits would be bundled accordingly (i.e. reducing the number of export cables per circuit)
[6] Within the trenches, cables buried at depths varying between 1.2m and 3m below ground level.

Potential effect	Maximum design scenario assessed	Justification
	A Temporary Construction Compound will be required to facilitate the HDD works, known as the Landfall Compound [PCC-1] with a maximum footprint of 70,000m^2 located to the west of Roman Bank. A temporary Duct Storage Compound [SCC-2] with a footprint of 27,000m^2, where in the event of a pushdown installation (Chapter 3 Project Description), the ducts for the landfall installation will be assembled and stored. A 4m high temporary noise bund will be constructed within the Landfall Compound between the TJB sites and Roman Bank to provide noise attenuation to mitigate potential disturbance to ornithological receptors at Anderby Marsh LNR (Chapter 22 Onshore Ornithology, Document Reference 6.1.22). The A52 Hogsthorpe PCC, Primary Construction Compounds and Secondary Construction Compounds are all temporary works areas; these are construction sites including hard standings, plant and equipment, lay down and storage areas for construction materials, plant and equipment, areas for spoil, areas for vehicular parking, bunded storage areas, areas for welfare facilities including offices and canteen and washroom facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure and areas for other facilities required for construction purposes. The A52 Hogsthorpe PCC will have a maximum footprint of 7,500m2 and be in use for a maximum duration of 51 months. There will be a maximum of 7 Primary Construction Compounds, with a combined maximum footprint of 110,000m2, which will be in use for a maximum duration of 36 months. There will be a maximum of 20 Secondary Construction Compounds , with a combined maximum footprint of 235,000m2, which will be in use for a maximum duration of 24 months. Cable installation compounds (to enable trenchless works) are required at the entry and exit point of all trenchless sections. Along the onshore ECC and 400kV cable corridor there are 324 Cable Installation Compounds (CICs), with a maximum combined footprint of 1,724,000m2, and which will be in use for a maximum duration of 6 months. It is assumed	

Potential effect	Maximum design scenario assessed	Justification
	that the whole CIC area will be stripped of vegetation. The locations are fixed within the design and are shown on Figure 3.5. There will be 700 Joint Bays along the onshore ECC and 400Kv cable corridor, with a maximum temporary habitat loss of 2.01ha. The locations are not fixed within the design at present. Main rivers, IDB and EA maintained assets will be crossed by trenchless techniques where technically practical. Trenched crossing will be undertaken on 52 ordinary watercourses. For the assessment presented, the Order Limits is assumed to be a maximum of 80m wide for open trench sections. In most instances, even where trenchless techniques will be used, culverts to enable the construction haul road to pass across the watercourse will be installed, leading to small areas of habitat loss at each crossing point.	
Impact 4: Impacts on protected and priority species including populations of rare arable weeds	The potential exists for protected and priority species to be killed or injured during construction, primarily during the vegetation clearance stage, but also during installation of culverts within watercourse as required for the construction haul road, and during general excavation and construction work. The potential exists for protected species and other light sensitive fauna to be disturbed by artificial light (if used during hours of darkness), noise and human presence. Lighting may also disrupt the prey availability for protected and priority species. With regards construction activity and when it is likely to be 'disturbing', except where otherwise agreed in the code of construction practice, construction of the onshore works and construction-related traffic movements to or from the site of the relevant work shall only take place between 0700 hours and 1900 hours Monday to Saturday with no activity	It has been assumed that in the absence of mitigation there is a risk of inadvertent killing or injury in all areas within the onshore Order Limits.

Potential effect	Maximum design scenario assessed	Justification
	on Sundays or bank holidays unless otherwise agreed with the local authority (as included in the Outline CoCP (Document Reference 8.1). Regarding construction noise, it is assumed that this will be generated during the entire working day. Regarding artificial lighting, it is assumed that this will be required at the beginning and end of the working day within the winter months to enable operatives to see for the entire working day. The methods of construction for the cable installation are described under Impact 3 above, enabling a high-level understanding of the likely associated disturbance. Regarding potential disturbance arising from the construction of the OnSS, vegetation clearance, grading, earthworks and drainage will be undertaken initially. Foundations may be piled, depending on the ground conditions. The proposed building substructures will be predominantly composed of steel and cladding materials although brick/ block-built structures are sometimes employed. The steelwork for buildings may be erected with the use of cranes, and the delivery of some elements (such as transformers for example) will, due to their size and weight, require specialist means of transportation, be classified as Abnormal Indivisible Loads, and be offloaded with the use of cranes, Self-Propelled Modular Transporters or skids. Most of the remaining equipment is anticipated to be erected with the use of small mobile plant and lifting apparatus. For major drill locations under rivers and main drains, vibratory sheet piling will be required within the associated compounds. The major drill locations are The River Haven, The River Welland, Hob Hole Drain, Slackholme Drain, The Wainfleet Relief Channel, and The River Steeping. The construction of these will take approximately 2 months. Potential damage to areas supporting populations of rare arable weeds (if present or where recently colonising during construction) could result in areas affected by temporary and permanent habitat loss, as described above.	

Potential effect	Maximum design scenario assessed	Justification
	During construction there is potential for the culverts to act as barriers to dispersal for aquatic species and species which use watercourses to commute through the landscape. There is also potential for cable trenches to act as physical barriers to dispersal for smaller species which could become trapped in them, and for construction activity in general to impede the movement of more disturbance sensitive species.	
Impact 5: Spread of INNS	The spread of invasive non-native species of plant could occur during construction if present in the area subject to works.	No records of INNS were returned in the desk study or during field surveys.
Operation and Maintenance		
Impact 6: Disturbance of protected and priority species during maintenance works	There is potential for unplanned maintenance work to lead to disturbance of protected species, if present in the vicinity of works. Maintenance works are assumed to be restricted to permanent infrastructure such as the OnSS, TJBs and Link boxes. Maintenance of created habitats will be required, but it is assumed that these types of works would be undertaken in line with the OLEMS (Document Reference 8.10) and any associated permits or licences and would not lead to negative impacts, being mitigated within the agreed/ consented maintenance methods.	It is assumed that impacts could occur as protected and priority species have been recorded within the Order Limits.
Decommissioning		
Impact 7: Impacts are likely to be similar to construction, but more limited in geographical extent and timescale and there would be no	Decommissioning could lead to negative impacts on ecological receptors as identified for the construction phase, although these are anticipated to be more isolated and infrequent, given most infrastructure will be left in-situ.	It is assumed that impacts could occur as protected and priority species have been recorded within the Order Limits.

Potential effect	Maximum design scenario assessed	Justification
permanent habitat loss.		

21.7 Embedded Mitigation

242. Mitigation measures that were identified and adopted as part of the development of the Project design and are therefore 'embedded' into the Project design; that are relevant to Onshore Ecology are listed in Table 21.14. General mitigation measures, which would apply to all parts of the Project, are set out first. Thereafter mitigation measures that would apply specifically to Onshore Ecology issues associated with the landfall, ECC and 400Kv cable corridor and OnSS, are described separately.

Table 21.14 Embedded Mitigation relating to Onshore Ecology

Project phase	Mitigation measures embedded into the project design
General	
Project design	Careful siting of the Order Limits to avoid direct impacts to designated sites and avoidance of direct impacts on key areas of sensitivity including Annex 1 and Priority Habitats (for example coastal sand dunes and reedbeds) which may support protected species, wherever possible. Where the Order Limits crosses LWS's and LWT reserves (such as Anderby Creek Sand Dunes LWS), trenchless techniques will be used. New habitats (primarily hedgerows and woodland planting) will be created around the OnSS. The Outline Landscape and Ecology Management Strategy (OLEMS) (document 8.10) sets out the key landscape and ecology principles to inform the future Landscape Management Plan (LMP) and EMP, which would then be conditioned as a requirement of the Development Consent Order (DCO) Application, post consent. The OLEMS presents embedded mitigation with regarding to habitat reinstatement, enhancement and creation. The future LMP and EMP would be based on the OLEMS principles and would set out the measures that the Undertaker and their contractors would be required to adopt. The future LMP and EMP will be prepared in consultation with Lincolnshire County Council and the Local Planning Authority (LPA).
Construction	
ECoW	Ecological Clerks of Works (ECoWs) will be employed to oversee construction work and minimise risks to IEFs, as described in the OLEMS. Checks for the presence of badger setts, reptiles, amphibians, hedgehogs and other protected or notable species will be carried out by the ECoW prior to vegetation clearance. Additional reasonable avoidance measures will be implemented, and mitigation licences will be applied for, as necessary.

Project phase	Mitigation measures embedded into the project design
Minimising disturbance to protected species beyond the construction footprint.	There will be a subsoil and topsoil bund within working areas of the Order Limits which will provide a degree of visual and acoustic screening between the works and the surrounding landscape. This is shown in Plate 22 of, Chapter 3 Project Description (Document Reference 6.1.3). The MDS includes for the use of silent piling technology (at landfall) and vibratory sheet piling, rather than impact piling along the onshore ECC and 400kV cable corridor, with impact piling limited to the OnSS Construction. See ES Chapter 26 Noise and Vibration (Document Reference 6.1.26). Artificial lighting during construction will be managed in line with the final CoCP to be drafted in line with the Outline CoCP (Document Reference 8.1). In response to comments from NE the Project has committed to the retention and protection of bat flight lines during construction using protective fencing (such as Heras) to protect retained hedgerows and trees (including their root structure) from damage during construction. These will further be retained and protected through sensitive lighting design, which will be outlined in the Artificial Light Emissions Construction Management Plan forming part of the final (CoCP).
Pollution prevention	As described in the Outline CoCP, detailed Construction Method Statements will be developed by the Principal Contractor for relevant construction operations. Relevant Construction Method Statements will be included as part of the final CoCP for each phase of the works. A final Construction Method Statement (CMS) will be drafted for agreement by local authorities, in consultation with the EA, as secured in the DCO. The crossing points would be specified to ensure that construction does not result in significant alteration to the hydrological regime or an increase in fluvial or tidal flood risk. The Outline CoCP includes the following, which are relied upon to varying degrees as embedded mitigation: ▪ Outline Noise and Vibration Management Plan; ▪ Outline Air Quality Management Plan; ▪ Outline Soil Management Plan; ▪ Outline Onshore Pollution Prevention and Emergency Incident Response Plan; and, Outline Surface Water and Drainage Strategy. The construction dust mitigation measures recommended as part of the construction dust assessment will form inclusion within the final CoCP, in agreement with the relevant Authority. All construction work will be undertaken in accordance with the Outline soil management plan (OSMP) Document Reference 8.1.3) as part of the

Project phase	Mitigation measures embedded into the project design
	Outline CoCP. All soil handling, placing, compaction and management will be undertaken in accordance with best practice (Defra, 2009). All construction work will be managed in line with the Pollution Prevention and Emergency Response Plan (PPREIRP) to be drafted in line with the Outline PPREIRP as included in the Outline CoCP (Document Reference 8.1.4). Construction will be managed in line with CIRIA – SuDS Manual (C753) (CIRIA, 2015) including the following measures: ▪ No discharge to main river watercourses will occur without permission from the Environment Agency (SuDS Manual); ▪ Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual); and, ▪ Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual). Construction will also be managed in line with Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532) (CIRIA, 2001). The standards that would be expected to meet any licence or environmental permit for works in relation to the water environment will be applied for all works (e.g. drilling, crossing, culverting, passing under or through) affecting the sea defence structures, Main Rivers, ordinary watercourses and IDB watercourses.
INNS	All construction work will be undertaken in accordance with the biosecurity measures outlined in section 3.4 of the OLEMS (Document ref 8.10).
Reinstatement	The Project has made a commitment to reinstate habitats as soon as practicable following construction. Hedgerows will be reinstated using a species-rich, locally appropriate native mixture. Where trees are lost these will be replaced with heavy standard trees at a 3:1 ratio. In response to comments from NE, the Project has committed to replace any trees to be removed for construction as soon as is practicably possible, within the Order Limits and at a greater number than have been removed. Older hedgerow saplings will be used to re-establish hedgerows more quickly, as well as gap-fill existing hedges. All saplings will be planted with appropriate protection from pests.
Operation and Maintenance	
General	Operational practices will incorporate measures to prevent pollution and increased flood risk, including emergency spill response procedures, clean

Project phase	Mitigation measures embedded into the project design
	up and control of any potentially contaminated surface water runoff. These measures will be included within an Environmental Management System (EnMS). The EnMS will include specific measures to avoid potential impact to protected or notable species or sensitive habitats. Where unplanned operational or maintenance works are required, appropriate mitigation measures would be developed and agreed with relevant consultees prior to works taking place.
Decommissioning	
General	Decommissioning practices will incorporate measure similar to the construction phase, to prevent impact to ecological features. Provision of a decommissioning plan in advance of decommissioning works is a requirement of the DCO, to include protection of ecological features, based on up-to-date survey information and relevant guidance in place at the time of decommissioning.

21.8 Assessment Methodology

243. The ecological impact assessment approach used in this report is based on CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland ('CIEEM Guidelines') (CIEEM, 2018, updated in April 2022), which are widely regarded as industry best practice.

21.8.1 Mitigation Hierarchy

244. Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied, residual effects are then identified along with any necessary compensation measures, and incorporation of proposals for biodiversity enhancement.

245. It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation, and enhancement. These terms are defined here as follows:

- **Avoidance** is used where an impact has been avoided e.g., through changes in the Project design;
- **Mitigation**, or minimisation, is used to refer to measures to reduce or remedy a specific negative impact in situ;

- **Compensation** describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and,
- **Enhancement** is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

21.8.2 Impact Assessment

246. The impact assessment process involved the following steps:

- Identifying and characterising potential impacts;
- Incorporating measures to avoid and mitigate (reduce) those impacts;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects (if required); and,
- Identifying opportunities for ecological enhancement.

247. When describing impacts, reference has been made to the following characteristics, as appropriate:

- Beneficial, negligible or adverse;
- Extent;
- Magnitude;
- Duration (short term <5 years, mid-term 5-10 years, long term >10 years);
- Timing;
- Frequency; and,
- Reversibility.

248. The impact assessment process considered both direct and indirect impacts:

- Direct ecological impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat occupied by an important bird species during the construction process.
- Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or features, e.g., the interruption of watercourses which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of downstream habitats used by important bird species.

21.8.3 Significant Effects

249. The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of the CIEEM Guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or

broad (e.g., national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

250. Paragraphs 5.29-5.34 of the CIEEM Guidelines cover how significant effects are determined. To summarise:

- For designated sites – effects may be significant if they are likely to undermine the conservation objectives of the site; or positively or negatively affect the conservation status of species or habitats for which the site is designated; or may affect the condition of the site or its interest/ qualifying features.
- For species – consideration of conservation status is important for evaluating the effects of impacts on individual species and assessing their significance. Conservation status is defined as the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

251. It is acknowledged that the wider project EIA has adopted a matrix-based approach to determining significance of effects, which differs from the approach set out in the CIEEM EcIA guidelines and followed by this chapter.

21.8.4 Assumptions and Limitations

252. To comply with the Precautionary Principle, it has been necessary to consider a worst-case scenario regarding both the design of the Project and the ecological baseline. Where there is uncertainty, ambiguity or a lack of information, a worst-case scenario has been assumed. For example, where the risk of a protected species cannot be assessed due to a lack of survey data, presence has been assumed.

253. Regarding potential impacts, within this assessment the construction footprint has been defined as all land within the Order Limits that is subject to vegetation clearance, cultivation, soil strip, excavation or construction activity for temporary and permanent infrastructure. The only areas that are considered to be free of potential direct impacts during construction are those that will be subject to trenchless technique, where it is assumed that no direct impacts to the ground surface (or habitats/ species occurring there) will occur (between the entry and exit pits).

254. Where a hedgerow runs parallel to an enabling access track or compound boundary it has been assumed that it will be retained. Where the enable access is perpendicular to a hedgerow, or runs through a compound area, then part of the hedgerow would most likely be lost.

255. For ease of reference, where zones of influence have been applied to assess the geographic extent of an effect, these are explained and justified in relation to individual ecological receptors.

256. Following NPPF and BNG principles, it is assumed that certain habitats are irreplaceable and are incapable of successful translocation or restoration, and as such, impacts to such habitats have been classed as ‘permanent loss’. Examples of irreplaceable habitats are veteran

trees and coastal sand dunes.

257. It is assumed that certain habitats are capable of successful translocation, restoration or reinstatement, and direct impacts to such habitats have been classed as 'temporary loss' where these occur in temporary works areas that will be reinstated following construction. It is considered appropriate to include reinstatement as embedded mitigation in this way, as the Project has made a commitment to reinstate habitats as soon as practicable following construction, as set out in Table 21.14.

21.9 Impact Assessment

21.9.1 Construction

258. This section presents the assessment of potential impacts arising from the construction phase of the Project.

21.9.1.1 Impact 1: Indirect Impacts on Designated Sites

Effects arising from Water Quality Impacts

259. Impacts in relation to water quality and the potential effects on water courses and ground water have been assessed in Chapter 24 Hydrology and Flood Risk Assessment (Document Reference 6.1.24) and are summarised below in relation to designated sites.

260. Chapter 24 identifies the potential for construction activities to generate turbid run-off, alter surface water runoff patterns which could affect flood risk, and pollute or disrupt flow to groundwater through excavations or piling. The assessment scopes out the risk of accidental spillages and leakages of oils, fuel and other polluting substances that could potentially enter the water environment.

261. The assessment concludes that due to embedded mitigation (Outline CoCP) any predicted effects on water quality are **not significant** in EIA terms.

Effects arising from Air Quality Impacts

262. Impacts in relation to air quality, including on designated sites, have been assessed in Chapter 19 Air Quality (Document Reference 6.1.19) and are summarised below in respect of ecological features. Of relevance to Important Ecological Receptors, the Air Quality Chapter assessed impacts arising from dust emissions, road traffic emissions and temporary construction non-road mobile machinery (NRMM).

Dust Emissions

263. The assessment found that the potential dust emission magnitude of the Project was large for earthworks, construction (permanent infrastructure) and trackout.

264. There are several designated ecological sites within 20m of construction working areas. These include Sea Bank Clay Pits SSSI, the Havenside LNR and several Local Wildlife Sites (LWS)/ Lincolnshire Wildlife Trust reserves (LWT) near the Landfall (i.e., route segment ECC1: Landfall to A52 – Hogsthorpe).

265. In relation to the Sea Bank Clay Pits SSSI, the aquatic plants and invertebrates may potentially be impacted by dust deposition due to smothering. However, impacts from

chemical changes are unlikely as the SSSI citation quotes the designation as already nutrient rich. Given this, as the SSSI is a national designation with potentially dust sensitive features/ species, it has been classified as a medium sensitivity receptor.

266. The Havenside LNR, and other LWS/ LWT are local designations and have been classified as low sensitivity due to the absence of dust sensitive features.

267. In terms of the identified trackout routes, there are only LWS/ LWT present within 20m or 50m. Given this and with use of the Institute of Air Quality Management (IAQM) assessment matrices , the sensitivity of the study area with respect to ecological impacts from trackout was assessed as low.

268. The sensitivity of the study area with respect to ecological impacts from earthworks and construction was assessed as being medium, given the presence of the Sea Bank Clay Pits SSSI within relevant screening distances.

269. Following the construction dust assessment, the risk of impacts from potential worst-case onshore construction works (in the absence of mitigation) was assessed as medium risk in relation designated sites.

270. The Outline CoCP includes an Outline Air Quality Management Plan (AQMP) (Document Reference 8.1.2) as part of the embedded mitigation for the Project, and the Air Quality Chapter concludes that this is sufficient to render effects **not significant** in EIA terms.

Road Traffic Emissions

271. The Air Quality chapter (Document Reference 6.1.19) presents the results of road traffic dispersion modelling involving conservative modelling of concentrations of nitrogen dioxide (NO_2), and particulate matter (PM_{10} and $PM_{2.5}$) on sensitive receptors.

272. To inform the spatial extent of the modelling, predicted changes in traffic volumes on the local road network were compared to ecological (and human) screening thresholds to identify the 'affected road network'.

273. All ecological designations with sensitive qualifying features which are located within 200m of the affected road network, were screened in for dispersion modelling.

274. With respect to sensitive qualifying features (habitats), consideration has been given to the relevant Critical Levels and Critical Loads using data provided by the Air Pollution Information System (APIS). In most cases a good match between the APIS habitat categories and the habitat descriptions within the ecological site description was possible, but where there was ambiguity in the habitat descriptions, the most sensitive habitat (those with the lowest critical thresholds) were selected for use in the assessment.

275. The impact of road traffic emissions were then modelled for ecological designations within 200m of the affected road network, with use of gridded and boundary receptors (to ensure maximum impacts are understood).

276. Where road traffic emissions were 1% or more of a Critical Level/ Load then effects were considered potentially significant and required detailed assessment. Only the Critical level for NOx was exceeded for some sites.

277. Further and more detailed modelling then plotted the spatial extent of NOx emissions. For three LWSs, false exceedances were generated by the model due to the boundary mapping of the LWS overlaying the highway. The exceedance points fell within highway and not within the habitat of the LWS and therefore no significant effect on the LWS is predicted.

278. For two remaining LWS, the A16 verges and Pinchbeck Marsh the modelling indicated exceedance points along the shared boundary of the LWSs and the adjacent highways, with exceedance points plotted in parallel to the highways and on the eastern/ north eastern side of the highways, likely due to prevailing wind from the south west. In both cases exceedance points occurred only along a narrow peripheral strip, extending no more than 2m into the LWS sites from the affected boundary, with data points further within the LWS indicating no exceedance of thresholds.

279. In both cases the affected strip contributed a very small proportion of the total LWS site area and as a consequence potential impacts from road traffic emissions on ecological receptors are therefore considered **not significant** in terms of the EIA Regulations.

Emissions from Temporary Construction Non-Road Mobile Machinery (NRMM)

280. Potential NRMM activity is predicted to occur within 50m of designated ecological sites, particularly around the Landfall, onshore ECC and 400Kv cable corridor and OnSS elements of the Project. Discrete construction activities are unlikely to occur concurrently in the same location. As outlined in Chapter 3 Project Description (document reference 6.1.3), these activities are temporary with a maximum construction window of up to 51-months for the landfall and OnSS and up to 42 months for the onshore ECC and 400kV cable corridor works

281. Several of the designated ecological sites are in proximity to potential Landfall activities and associated NRMM activity. Less than half (43.6%) of the Sea Bank Clay Pits SSSI is within 50m of such activity, and the affected area is likely to be further reduced once the locations of activities are finalised.

282. One designated ecological site is located near the OnSS construction area. This is the Risegate Eau LWS, however, only 5.7% of the designation is potentially impacted by NRMM activity.

283. The maximum annual mean background concentrations across the study area are well below the respective Critical Levels. Concentrations across the full extent of the Order Limits are expected to vary and be lower relative to the maximum reported.

284. The embedded mitigation, the short-term, transient, phased nature of the construction works, the background pollutant concentrations and the potential areas of the designations affected, suggest the likelihood of NRMM causing an exceedance or significant effect is low. Potential impacts from NRMM emissions on ecological receptors are therefore considered **not significant** in terms of the EIA Regulations.

21.9.1.2 Impact 2: Permanent loss of Habitats, including Irreplaceable and Priority Habitats.

Permanent Loss or Damage to Irreplaceable Habitats

Veteran Trees

285. No veteran trees were recorded within temporary or permanent works areas, although 12 trees were not subject to detailed assessment. Of these 12 trees 4007, 4009 and 4015 are located within or immediately adjacent to enabling access tracks, which will have no impact on the trees, as these will use existing farm tracks or track matting and can be micro-routed to avoid impacts.

286. Trees 5870, 5875, 5876, 5880, 5881, 5883, 5887, 5888 and 5890, are located within the segment ECCD 14, for which there is very limited design detail.

287. Given the location of the NGSS and therefore exact connection point for the Project is not yet known, the location of the 400kV cables within this area cannot be confirmed. Any tree that cannot be retained will be subject to pre-construction surveys to assess if ancient or veteran or not. Appropriate compensation for any losses of veteran or ancient trees will be agreed with the LPA in consultation with other relevant stakeholders and the EMP will be updated as necessary.

Permanent Loss of Priority Habitat

288. The maximum total area of Priority Habitats permanently lost totals 0.963 ha. Permanent habitat losses are limited to arable field margins (c1a) and are associated with offsite and onsite planting around the OnSS, the permanent access track and highways alterations. A total of 0.843 ha (87.5%) of the 0.963 ha permanently lost arable field margins will be replaced with new hedgerow and woodland planting around the OnSS. Table 21.16 Total Area of Priority Habitat below sets out the Priority Habitat types and the total areas that will be permanently lost. The spatial distribution of these habitats in relation to the permanent works footprint is shown in Figure 6.2.21.4.

Table 21.15 Total Area of Priority Habitat within the Permanent Works Footprint

Priority Habitat Type	Total area / length within Survey Area (ha /m)	Total area /length within the permanent works footprint (ha /m)
Arable field margins (UKHab c1a, c1a5)	c1a – 85.04ha c1a5 - 0.44ha	c1a – 0.963ha* c1a5 – 0 *(87.5% (*0.843ha) of the c1a permanently lost will be replaced with new hedgerow and woodland planting around the OnSS.)*
Coastal and floodplain grazing marsh / Grazing marsh (UKHab g3 25 and g4 25)	g3 25 – 3.95ha g4 25 – 19.37ha	g3 25 – 0 g4 25 – 0

Priority Habitat Type	Total area / length within Survey Area (ha /m)	Total area /length within the permanent works footprint (ha /m)
Coastal saltmarsh (UKHab t2a) including Estuaries (UKHab 30)	1.22ha	0
Coastal sand dunes (UKHab s3a5)	1.93ha	0
Hedgerows (including hedgerows with trees) (UKHab h2a)	12,620m	0
Intertidal Mudflats (UKHab t2d) including Estuaries (UKHab 30)	5.37ha	0
Lowland grassland (UK Hab g3)	3.95ha	0
Lowland mixed deciduous woodland (UK Hab w1f)	0.88ha	0
Priority ponds (and lakes) (UKhab r1 19)	0.7ha	0
Reedbeds (f2e)	1.99ha	0
Rivers (UK Hab r2)	12.76ha	0
Wet woodland (UK Hab w1d)	0.01ha	0

289. With regard to arable field margins, this habitat was recorded frequently within the Order Limits, being present in most arable fields and in every segment ECC 1 – ECC 14. Further, land use and habitats within the Order Limits are typical of those in the wider agricultural landscape, with arable field margins being widespread in the local area. The most recent LBAP (2011 – 2020) reported an increasing trend in this habitat at the county level at the time of writing. In the absence of mitigation, the predicted permanent loss equates to 1.13% of the total area of arable field margin habitat within the Order Limits and is considered to represent a minor negative effect at the site level only, which is **not significant** in EIA terms.

290. Proposed planting around the OnSS will work around existing hedgerows, reinforcing these habitats with belts of planting comprising woodland and hedgerow trees. The hedgerows as a habitat will be retained, albeit some ecological functionality will be altered. This is discussed in the relevant species sections.

21.9.1.3 Impact 3: Temporary Loss of, or Damage to, Priority Habitats.

Direct Loss Arising from Construction Activities in Temporary Works Areas

291. There are areas of Priority Habitat beyond the permanent works footprint, within the wider construction footprint, and without mitigation these could be temporarily lost or damaged (for habitats for which translocation/ reinstatement is possible). Table 21.16 Total Area of Priority Habitat below sets out the Priority Habitat types and the total areas within the construction footprint. The spatial distribution of these habitats in relation to the temporary works footprint is shown in Figure 6.2.21.3.

Table 21.16 Total Area of Priority Habitat within the Temporary Works Footprint

Priority Habitat Type	Total area/ length within Survey Area (ha/ m)	Total area/ length within the Temporary Works Footprint (ha/ m)
Arable field margins (UKHab c1a, c1a5)	c1a - 84.80ha c1a5 - 0.44ha	C1a – 5.13ha C1a5 - 0
Coastal and floodplain grazing marsh / Grazing marsh (UKHab g3 25 and g4 25))	g3 25 – 3.95ha g4 25 – 19.37ha	g3 25 – 0 g4 25 – 0
Coastal saltmarsh (UKHab t2a) including Estuaries (UKHab 30)	1.22ha	0
Coastal sand dunes (UKHab s3a5)	1.93ha	0
Hedgerow (including hedgerows with trees) (UKHab h2a)	12,620m	313m
Intertidal Mudflats (UKHab t2d) including Estuaries (UKHab 30)	5.37ha	0
Lowland grassland (UK Hab g3)	3.95ha	0
Lowland mixed deciduous woodland (UK Hab w1f)	0.88ha	0
Priority ponds (and lakes) (UKhab r1 19)	1.07ha	0
Reedbeds (f2e)	1.99ha	0.01ha
Rivers (UK Hab r2)	12.76ha	0
Wet woodland (UK Hab w1d)	0.01ha	0

292. All temporarily lost habitats will be reinstated at the earliest possible opportunity, ensuring any potential impacts are only in effect in the short term. It is acknowledged that reinstated hedgerows will take time to establish, however in the moderate and long-term no impacts are predicted.

293. With regard to arable field margins, all soils will be managed in line with the final Soil Management Plan (SMP) (which will be in accordance with the Outline SMP submitted alongside this ES (document reference 8.1.3), such that reinstatement of arable field margins will initially result in a seedbed where rare arable weeds potentially present in the seed bank (and protected by careful soil handling practices), could flourish. A positive effect for rare arable weeds (if present) could occur in at least the first year following reinstatement, during which competition from more dominant pants would be reduced. On balance effects on arable field margins are not considered to be significant because such as small proportion of the available resource will be impacted.

294. Hedgerows will be reinstated at the earliest opportunity and using a more diverse species-mixture than typically recorded within the Order Limits. A loss of such a small length of hedgerow is **not considered to be significant** in EIA terms.

295. As the reinstated hedgerows establish, this negative effect at the site level is predicted to become negligible in the medium term, with a positive effect at the site level in the long term as a result of increased biodiversity and ecological functionality.

296. On balance the temporary loss of 1.5% of reedbed habitat within the Order Limits is not considered to be significant because it is such a small proportion of the available resource. In addition, post-impacted areas are considered likely to become rapidly recolonised by species

comprising this habitat even without reinstatement.

297. Reinstatement of habitats is described within the OLEMS, which sets out specific measures for hedgerow planting, monitoring and management.

21.9.1.4 Impact 4: Impacts on Protected and Priority Species including Populations of Rare Arable Weeds

298. This section is ordered by species or species group, assessing each in turn for the risk of direct or indirect impacts.

Rare Arable Weeds

299. Although not subject to detailed impact assessment, due to the potential for rare arable weeds to have been dormant and not detected during field surveys, as a precautionary measure, mitigation measures are proposed including sympathetic top-soil management, avoidance of herbicide use during construction, and pre-construction surveys for any directly impacted suitable habitat.

300. Commitments around the handling and storage of topsoil are made within the Outline Soil Management Plan (SMP) as part of the Outline CoCP which is included as Embedded Mitigation. However, for the purposes of evidencing the applicability of this mitigation to minimising potential impacts on rare arable weeds, details are provided below.

301. All works will be carried out in accordance with BS5930: 1999 (The Code of Practice for Site Investigations) and BS10175:2001 (Investigation of Potentially Contaminated Sites) and include the following measures:

- All construction work will be undertaken in accordance with the Outline Soil Management Plan (SMP) (Document Reference 8.1.3), as part of the Outline CoCP submitted with this DCO Application;
- The SMP is intended to ensure that, following construction, agricultural land quality and productivity will be returned as quickly as possible to pre-construction levels;
- The SMP includes a commitment to the Project commissioning a Soil Clerk of Works and soil testing across the Order Limits;
- All soil handling, placing, compaction and management will be undertaken in accordance with good practice (DEFRA, 2009), and include for mitigations against the spread of weed and non-native species (see Biosecurity Measures outlined in Section 3.4 of the OLEMS (Document Reference 8.10)), and the spread of disease;
- Topsoil and subsoil will be stored in separate stockpiles in line with DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298 or the latest relevant available guidance; and,
- Re-instatement of topsoil.

302. To further minimise impacts, alternatives to herbicides will be used wherever possible during the construction phase.

303. Prior to works commencing, pre-construction surveys of habitat with suitability for rare arable weeds subject to direct impacts will be undertaken. Where additional mitigation, i.e.

outside those measures already committed too, this will be agreed in writing with the appropriate stakeholders and updates to the future EMP will be made, as necessary.

Invertebrates

304. Nineteen invertebrate species are listed on the LBAP as being of importance in the county some of which are associated with the priority habitats identified during the UK Hab survey, however these habitats will not be significantly affected by the Project and direct effects on these species are predicted to be unlikely.

305. Land parcels assessed as having medium or high habitat quality for invertebrates and within proximity of the Project are listed in **Table 4-1** below. Table 4-1 provides broad habitat types from Pantheon (Webb, J. *et al.*, 2018) (a database tool developed by Natural England and the Centre for Ecology & Hydrology to analyse invertebrate sample data) to evaluate associated habitats and resources, assemblage types (adapted from the Invertebrate Species-habitat Information System [ISIS]), and habitat fidelity scores.

306. Most parcels are assessed as having negligible adverse or no impact, and a neutral significance of effect. One parcel, 8487 in ECC 1, is assessed as having a moderate adverse effect. This is due to primary construction compound (PCC) 1 and access route passing through the habitat (see Figure 3.4.8 of Chapter 3 (document reference 6.2.3.4). The temporary nature of the works, with reinstatement following the works completion, and the limited area affected with identical habitat present adjacent to the parcel (parcel 9534) being unmodified, will limit any impacts on invertebrate populations with sufficient habitat remaining to preserve species presence and any loss of individuals is likely to be made up quickly. Therefore, predicted effects are not significant and a beneficial effect should be possible if enhancement opportunities for terrestrial invertebrates can be incorporated into the Project.

307. Overall, a **negligible effect** is predicted on habitats for invertebrates of **National** and **Local** which is **not significant** in EIA terms and therefore no invertebrate specific mitigation is proposed.

Table 21.17 Land Parcels with Habitat Quality, Pantheon habitats, Impacts and Significance of Effects

Section	Land Parcel ID	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Importance	Impacts	Significance of Effect
ECC 1: Landfall to A52 – Hogsthorpe	5093	M	F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	Local	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	5104	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	5116	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	7301	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	7390	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	7804	H	C24: Brackish pools & Ditches F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	National	14m from nearest work. Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	7941	M	C21: Saltmarsh	National	Area will be bypassed by directional drilling,	Not Significant

Section	Land Parcel ID	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Importance	Impacts	Significance of Effect
					buffered from development areas, negligible adverse	
ECC 1: Landfall to A52 – Hogsthorpe	8272	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8279	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8290	M	F21: Tall Sward & Scrub F23: Short Sward & Bare Ground	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8292	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8293	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8465	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8487	M	F21: Tall Sward & Scrub	Local	Temporary Access Trackway through habitat, moderate adverse.	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8496	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling,	Not Significant

Section	Land Parcel ID	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Importance	Impacts	Significance of Effect
					buffered from development areas, negligible adverse	
ECC 1: Landfall to A52 – Hogsthorpe	8499	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8501	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	8752	H	C24: Brackish pools & Ditches W24: Marshland	National	72m from nearest work. Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	9516	M	C23: Sandy Beach	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	9534	M	F21: Tall Sward & Scrub	Local	Adjacent to works, possible impacts on nearby meta populations, negligible adverse	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	12278	M	F21: Tall Sward & Scrub	Local	4km from closest section of works, no impact	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	12280	M	W22: Lake	Local	4km from closest section of works, no impact	Not Significant
ECC 1: Landfall to A52 – Hogsthorpe	18560	H	C24: Brackish pools & Ditches F21: Tall Sward & Scrub	National	350m from closest above ground work, not functionally linked to affected habitats, no impact	Not Significant

Section	Land Parcel ID	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Importance	Impacts	Significance of Effect
ECC 2: A52 - Hogsthorpe to Marsh Lane	7410	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub W22: Lake	National	74m from nearest work, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 4: A158 Skegness Road to Low Road	9748	M	F23: Short Sward & Bare Ground F21: Tall Sward & Scrub	National	45m from nearest work, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 5: Low Road to Steeping River	6154	M	F23: Short Sward & Bare Ground	National	15m from nearest work, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 5: Low Road to Steeping River	6290	M	F21: Tall Sward & Scrub	Local	Adjacent to enabling access track, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 5: Low Road to Steeping River	19097	M	W22: Lake W24: Marshland	Local	340m from nearest work, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 6: Steeping River to Fodder Dike Bank/Fen Bank	23854	M	F21: Tall Sward & Scrub	Local	50m from nearest work, isolated site with no functional link in direction of works., no impact	Not Significant
ECC 7: Fodder Dike Bank/Fen Bank to Broadgate	24727	H	F21: Tall Sward & Scrub	Local	350m from nearest work, isolated site with no functional link in direction of works, no impact	Not Significant
ECC 10: Church End Lane to The Haven	8720	M	F23: Short Sward & Bare Ground C24: Brackish pools & Ditches	National	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant

Section	Land Parcel ID	Assessed Habitat Quality for Invertebrates	Pantheon Habitats Present	Importance	Impacts	Significance of Effect
ECC 11: The Haven to Marsh Road	7100	M	F23: Short Sward & Bare Ground	Local	Area will be bypassed by directional drilling, buffered from development areas, negligible adverse	Not Significant
ECC 12: Marsh Road to Fosdyke Bridge	6885	M	C25: Saline Lagoon C21: Saltmarsh	National	30m from closest above ground work, not functionally linked to affected habitats, no impact	Not Significant
ECC 12: Marsh Road to Fosdyke Bridge	6890	M	C24: Brackish pools & Ditches C21: Saltmarsh	National	80m from closest above ground work, not functionally linked to affected habitats, no impact	Not Significant

Eels

Impacts

308. The potential for eels to migrate along the River Welland and the River Haven was identified in the baseline section.

309. Trenchless techniques will be used in install cables below these two rivers, therefore direct impacts, such as killing of fish, are unlikely. However, the launch and receptor pits will require the use of sheet piling to enable cable installation to take place, the major trenchless crossing works are expected to take approximately 2 months, with minor drills taking less time

310. Based on the expected geology being a mix of sands, clays and muds, the sheet piles would likely be installed using a (vehicle) mounted vibration hammer, although it is acknowledged that it may be necessary to use drop hammer to finish the installation of some sheets.

311. Piling is known to create impulsive noise, which can lead to killing, injury or behavioural disturbance of fish in extreme cases. The HDD compounds are located c.100m from both rivers and the majority of the work is likely to be completed with a vibration hammer, such that impacts of the magnitude required to cause mortality or injury are not predicted. Further, impacts are likely to be intermittent over a short duration, and therefore the risk of eels being present and disturbed during the works is considered to be low.

Assessment of Effects

312. Based on the outline detail available, **no significant effects** on the local population of eels are predicted.

Mitigation

313. It is acknowledged that the detailed design of the trenchless cable installation will be further refined at contract award, and therefore to mitigate impacts arising from any changes,

an update fish impact assessment will be undertaken (if required), and measures in the EMP updated (where required) and agreed with relevant stakeholders.

Amphibians

Impacts

314. None of the eight ponds (WM_P7; WM_P8; WM_P9; WM_P10; WM_P11; WM_P38; WM_P39 and WM_P40) identified within the Order Limits will directly impacted by the proposals. Some ditches with potential for GCN will be directly impacted and these are discussed in subsequent paragraphs.

315. Discrete populations of GCN are present around segment ECC 3 and ECC 6 within 500m of the Order Limits. Figure 21.5.6 shows the interaction of the proposals with GCN ponds and their supporting habitat.

316. The metapopulation in segment ECC 3 has been confirmed at pond WM_P42, located c.100m east of the Order Limits, by eDNA sampling, and other ponds to the west of the Order Limits by the desk study. There will be no direct impacts to these ponds.

317. Ditches 626 (leading into 625) and 627 (leading into 629 and 628) link pond WM_P42 to habitats, including the desk study ponds, to the west of the Order Limits, and could be used by GCN to move between them. These potentially connecting ditches will be subject to trenchless techniques during cable installation, although a culvert will likely be installed in each of ditches 625, 626 and 629 to enable the construction haul route to pass over them. The assessment has assumed a8-10m stretch of bank would be impacted at each culvert during installation.

318. The total area of temporary habitat loss that falls within 500m of WM_P42 and the nearest desk study record is shown in Table 21.18Table 21.18 Habitat loss near GCN Ponds, which compares habitat loss to thresholds used in Natural England's rapid risk assessment tool within their GCN Method Statement template[7]. The rapid risk assessment tool suggests that an offence, in respect of GCN would be highly unlikely, and this indicates that a significant impact on the metapopulation is unlikely.

319. The metapopulation in segment ECC 6 have been confirmed in three locations within/ around Decoy Wood from the desk study. Decoy wood is located c.30m to the west of Order Limits such that there will be no direct impacts on the woodland or pond(s) therein.

320. Ditch 202769 runs along the eastern edge of the woodland (nearest to Order Limits) and is connected to ditches 20273, 20262 and 20263, which perpendicularly cross the Order Limits. Therefore, GCN could use these ditches to move to and from the woodland, although the results of the HSI and eDNA surveys indicate the habitats are suboptimal and GCN are likely absent. These potentially connecting ditches will be subject to trenchless techniques during cable installation, although a culvert will likely be installed in each for the construction haul route.

321. The total area of temporary habitat loss that falls within a 500m buffer of the nearest GCN record at Decoy Wood is shown Table 21.18, and as works are proposed within 100m, this could

[7] https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence

trigger an offence. However, as breeding habitat will not be affected, and no isolation effects are predicted (see below), only a minor negative effect on the metapopulation is predicted.

Table 21.18 Habitat loss near GCN Ponds

GCN Pond Ref	Temporary habitat loss near to GCN ponds (Ha)			Likely effect
	Land within 100m	Land 100-250m	Land 250- 500m	
WM_P42	0	0	4.211	No significant effect - offence highly unlikely
ECC 3 Desk study record (nearest to Order Limits)	0	0	1.93	No significant effect - offence highly unlikely
ECC 6 Desk study record (nearest to Order Limits)	0	1.43	4.84	Significant effect – offence likely

322. As small areas of habitat within 500m of GCN ponds will be directly impacted, for example the sections of watercourse subject to culvert installation, in the absence of mitigation it is not possible to totally rule out impacts to individuals, and there is a risk of killing or injuring GCN.

323. Further, enabling access tracks have not been included as temporary habitat loss, as existing tracks will be used where available, and track matting laid where necessary, meaning that no habitat will be removed. However, track matting can be used by GCN as refugia and therefore unmitigated installation and removal can lead to killing and injury of individual GCN.

324. As detailed in Table 21.15 and Table 21.16, a very low proportion of surface water features and other suitable terrestrial habitat will be permanently or temporarily lost. However, small areas of such habitats will be directly impacted and therefore in the absence of mitigation, there is potential for killing or injury of individual amphibians.

325. All land affected by temporary works will be reinstated and therefore no effects arising from habitat loss are predicted in the medium or long term.

326. No isolation or fragmentation effects are predicted during construction for amphibians because most watercourses, and their associated marginal, vegetated areas, will be subject to trenchless cable installation resulting in the retention of multiple, regularly spaced strips of vegetation which will serve as shelter habitat and crossing routes across the Order Limits. Open trench techniques are predominantly only proposed for arable field interiors, which are less attractive to amphibians.

Assessment of Effects

327. Regarding effects on GCN, common toad and smooth newt, there is a risk of killing or injury of individuals. However, no direct impacts on GCN breeding habitat are predicted and the temporary loss of other habitats is not predicted to lead to significant negative effects on any amphibian populations, other than a significant effect on the GCN metapopulation at EEC 6. On balance, in the absence of mitigation, a **negligible effect** on the locally important amphibian populations within the Order Limits is predicted, and this predicted effect is **not significant** in EIA terms.

Mitigation

328. As there is a risk of killing or injuring GCN, a derogation licence is likely to be required for works within 250m of the two metapopulations identified. The detailed design will be reviewed, and GCN survey updated as necessary, to fully inform an assessment of whether a GCN mitigation licence is required. Where impacts on GCN cannot be avoided by other means, a licence will be obtained from NE in advance of works. There are three different licences that may be suitable, depending on the scale of the predicted impacts: a mitigation licence (NE A14), registration under the Low Impact Licence (NE WML-CL33) or district level licencing, which is not currently available in Lincolnshire. Depending on the licensable activities, mitigation measures would likely be limited to destructive searches, staged vegetation clearance and provision of artificial refugia. It is not predicted that amphibian exclusion fencing, and capture and translocation would be required because of the small areas of habitats and likely low numbers of individuals affected. The creation of new ponds in compensation for impacts is not predicted as no GCN-positive ponds are impacted by the proposed scheme. Compensation measures for impacts to terrestrial habitat can readily be accommodated within works activities and provided within the Order Limits.

329. Irrespective of the need for a licence, reasonable avoidance measures (RAMS) will be adopted to mitigate impacts to amphibians during vegetation clearance and site preparation works and supervised by the ECoW. Such measures would include destructive searches of potential refugia and staged vegetation clearance to persuade amphibians to move out of construction areas. Any refugia with hibernation potential would be taken apart during the active season, to avoid disturbing hibernating amphibians.

330. Opportunities for enhancement and creation of terrestrial habitats exist at both the OnSS and the surrounding proposed landscape screening in Segment 13, illustrated in Volume 2, Figure 28.15 (Document Reference 6.2.28.15). Subject to detailed design and agreement from landowners, this could include the management of habitats specifically for amphibians along with the creation of refugia, wider and more species rich field margins, and an increase in the network of wildlife corridors for amphibian movement.

331. Enhancement opportunities may also be available in segments ECC 3 and ECC 6, where the two GCN metapopulations exist. A considered approach to enhancement of habitats within these segments could also be of benefit to reptile. For example, at Pond WM_P42, which has been confirmed to support GCN and is functionally linked (via Ditch 626) to Reptile Area 11, a small area grassland evaluated to be of 'poor' quality for reptile (Figure 21.8.1.5). Also at Decoy Woods, an area of 'good' quality habitat for reptile (Reptile Area 22 in Figure 21.8.1.10) is also thought to support the metapopulation of GCN within ECC 6.

Reptiles

Impacts

332. In the absence of mitigation, where vegetation clearance, soil strip and other site preparation works affect habitat suitable for reptiles, there is a risk of killing or injuring individuals. There is also potential for the construction infrastructure to create barriers to

dispersal, leading to isolation of populations and fragmentation of habitat.

333. The areas of exceptional and good habitat impacted during the construction phase are presented in Table 21.19 below and shown in Figure 21.6.1. Impacts upon poor quality habitat are not considered as such areas are not likely to support significant populations of reptiles.

334. No temporary or permanent impacts are predicted for the good or exceptional reptile habitat in Areas 1, 5, 6, 7, 8, 9, 12, 14, 15, 17, 18, 21, 22, 23, 24, 25, 28, 31, 33, 34, 35, 36, 38, 43 and 44.

335. No permanent impacts are predicted for any area identified as having good or exceptional reptile habitat quality.

Table 21.19 Areas of Good or Exceptional Reptile Habitat Impacted during Construction

Segment	Reptile Habitat Area	Quality of habitat	Total Area (Ha)	Temporary loss (Ha)	Permanent loss (Ha)	Temporary loss as % of total Area
ECC 1	Area 4	Good	5.45	0.38	0	6.97
ECC 3	Area 13	Good	15.55	0.44	0	2.83
ECC 5	Area 16	Exceptional	5.74	0.15	0	2.61
	Area 19	Good	3.21	0.01	0	0.31
	Area 20	Good	1.86	0.01	0	0.54
ECC 6	Area 26	Exceptional	1.15	0.003	0	0.26
ECC 7	Area 27	Good	1.60	0.001	0	0.06
ECC 8	Area 32	Exceptional	2.81	0.02	0	0.71
ECC 11	Area 37	Exceptional	7.09	0.09	0	1.27
ECC 13/14	Area 39	Exceptional	35.00	2.39	0	6.81

336. The central part of Area 4 will be temporarily impacted by a CIC 15 and the haul road, which dissects this area into two parts. Although the temporary habitat loss is not considered to be significant, there are no culverts under the haul road to allow reptile movement and therefore without additional mitigation, the (assumed) reptile population could be subject to isolation effects.

337. Area 13 is impacted by CIC 65 and the haul road, which dissects this area, although only a small part is isolated. There are no culverts under the haul road to allow reptile movement. Temporary habitat loss is not considered to be significant and although there are no culverts, the (assumed) reptile population is unlikely to suffer isolation effects as it is likely that most would be present in the larger unaffected area.

338. Area 16 will be temporarily impacted by CIC 91 and 92 and the haul road. The area lost represents a very small percentage of the total area and is not considered significant in terms of habitat loss. Area 16 is dissected by the haul road, however it passes over watercourse 20004, and therefore it is assumed that a culvert will be installed.

339. Area 19 may be temporarily impacted by works to reinforce an existing bridge across the Wainfleet Relief Channel, although it is anticipated that temporary habitat loss would be minimal and that no isolation effects would occur, as the channel and riparian areas beneath the bridge would remain as continuous habitat throughout the works.

340. Area 20 will be temporarily impacted by the haul road, but the area of habitat loss is so small it is considered insignificant. No isolation effects are predicted for Area 20.

341. Area 26, which is part of Decoy Wood and extends beyond the Study Area to the west, includes a ditch and associated bankside habitat, which will be subject to culvert installation for the haul road to pass over. The habitat loss is considered to be insignificant, and the culvert will mitigate isolation impacts somewhat.

342. A very small area on the periphery of Area 27 will be temporarily impacted by CIC 145, however this is not considered significant. No isolation effects are predicted.

343. A small part of Area 32 will be isolated from the main by the haul road, however the haul road passes over two filed drains (20604 and 20597) and therefore culverts will likely be installed. As the isolated part represents a small proportion of the wider reptile area and the culverts will reduce the barrier effect of the haul road, no significant effect is predicted.

344. A very small area of habitat will be temporarily impacted by the haul road in Area 37. The area is so small that it is considered insignificant. No isolation effects are predicted.

345. A large area of (2.39ha) will be temporarily impacted within Area 39, although this represents a small percentage of the total reptile habitat. Area 39 has been identified as having particular importance for grass snake. Temporary losses are largely due to a variety of access tracks, which for the majority of their length follow existing farm tracks. Some habitat loss may occur during the upgrade of existing tracks and construction of new sections on both sides of the River Welland. However, the riparian habitat immediately adjacent to the River Welland will not be impacted and habitat linkages to its tributaries will be retained. Therefore no significant effects arising from habitat loss or isolation effects are predicted.

Assessment of Effects

346. On balance, with regard to effects on grass snake, it is considered that, in the absence of mitigation, during construction there is a risk of killing or injury of individuals, but that due to high mobility and large ranges of this species, small areas of temporary habitat loss are unlikely to have a significant effect on the local population, and isolation or fragmentation effects are similarly unlikely. Therefore, a **negligible effect** on the locally important grass snake population(s) with the Order Limits is predicted, and this predicted effect is **not significant** in EIA terms.

347. Regarding effects on common lizard and slow worm, in the absence of mitigation, there is a risk of killing and injury of individuals during vegetation clearance and site preparation works. However, unlike grass snake, these species have small ranges and are not frequently recorded in the local area. The lack of desk study records, albeit likely a result of under-recording, could also be an indicator of infrequent and scattered populations. Therefore, temporary loss of habitat and isolation effects (such as those predicted for Area 4), in addition to potential killing and injury impacts, could have a significant negative effect on populations of these species if present in affected habitats. Therefore, in the absence of mitigation, an **adverse effect** is predicted at the **county level**. Mitigation is therefore proposed to ensure that impacts to these species can be reduced.

Mitigation

348. Regarding mitigation, RAMS will be adopted to mitigate impacts to reptiles during vegetation clearance and site preparation works in areas identified as having good or exceptional reptile habitat, for example CIC 91 and 92 in Area 16. Measures would be similar to those employed for GCN, and would include destructive searches of potential refugia, staged vegetation clearance to persuade reptiles to move out of areas to be affected by construction activities and supervised topsoil strip as appropriate. Any refugia with hibernation potential would be taken apart during the active season, to avoid disturbing hibernating reptiles.

349. Where the haul road results in isolation effects, as predicted for Area 4, routes to enable the safe passage of reptiles (particularly common lizards and slow worm) across the road will be incorporated. Such measures could include pipes or 'Newt Grids' that pass beneath the haul road, connecting habitats on either side.

350. Temporary compensation for the loss of shelter habitat will be provided by the creation of artificial refugia located within the order limits in area that are well connected to reptile habitat in the wider area and that are undisturbed by construction activity. Artificial refugia will be created before vegetation clearance and destructive searches begin in any given area.

351. Pre-construction surveys will be undertaken to refine the mitigation measures set out above. Any additional measures required to minimise impacts to reptiles and their habitats, will be agree with statutory consultees and detailed in the EMP.

352. Habitat re-instatement, which is committed to in the OLEMS (Document Reference 8.10), will ensure that there is no medium or long-term loss of suitable habitat.

353. It is considered that the short-term significant adverse effect predicted, would be reduced through the implementation of these mitigation measures and that the medium and long-term impacts to reptile populations are **not significant** in EIA terms.

354. Opportunities for enhancement and creation of reptile habitats are similar to those outlined for GCN in Section 9.1.4.5 of this chapter. They include the enhancement and creation of habitats at the OnSS and surrounding landscape planting in ECC 13, as well as at Reptile Areas 11 and 22 (where GCN metapopulations are considered to exist).

Bats

Impacts – Direct Impacts to Roosts inside Order Limits

355. There are no buildings within the Order Limits to support roosting bats, however one low conservation status bat roost (day roost used by a single common pipistrelle bat) was identified within Tree 1095. Tree 1095 is located within a trenchless zone, between two roads; no significant direct or indirect impacts are predicted.

356. A total of 14 trees with low or above roosting potential are located within the Order Limits. Of these, only four trees (low potential trees 1558 and 1559 and high potential Trees 3767 and 4954) potentially interact with the proposed infrastructure, the remainder being located in areas where impacts are not predicted (where trenchless techniques are proposed).

357. High potential Tree 3767 is located approximately 9m from a haul road, within a trenchless

zone and therefore no significant direct impacts are predicted, although some peripheral parts of the tree's roost system may be impacted. This is not considered likely to damage the tree significantly.

358. High potential Tree 4954 is located adjacent to a proposed Enabling Access Track. As this track does not require any excavation work and will follow the existing farm track in that location, the tree is predicted to be retained with no direct impacts.

359. Low potential Trees 1558 and 1559 are both lie within CIC115, along a former hedge line. It is possible that these trees will require removal.

Impacts –Impacts to Roosts inside 25 m Buffer

360. Moderate potential Tree 4217 is located outside the Order Limits, between, and approximately 5m from, a Secondary Construction Compound and a temporary access track. There is potential for impacts to the tree's roots which could damage the tree, although there is likely to be sufficient flexibility in the layout of the construction compound to avoid the tree rooting zone.

361. There are a total of seven buildings with Low potential and three buildings with Moderate potential within 25 metres of the Order Limits. There are also a total of 43 trees with Low or above Potential. However, due to the distance between working areas and these potential roosts, no negative effects are predicted to arise.

362. It is therefore considered that there will be **no significant effect** on the bat roosting resource either within the Order Limits, or within the 25m buffer beyond it.

Impacts to Foraging Areas and Flight Lines

363. The habitats to be temporarily or permanently impacted within the Order Limits are predominantly of low value as a foraging resource and are well represented in the wider area. Therefore, the Project is not predicted to lead to any significant negatively effects on the core foraging habitat of any bat species.

364. With regard to flight lines however, the removal of linear habitats could lead to severance of flight lines which in turn could jeopardise the viability of roosts by, at least partially, isolating them from core foraging areas (outside the Order Limits) and other roost sites.

365. Brown long-eared is particularly susceptible to severance of flight lines due to its habit of flying close to vegetation and dependency on linear habitats to navigate through the landscape. Further, the loss of sections of hedgerow has potential to impact on other bats that utilise hedgerows as flight lines such as Pipistrelle and Myotis bats.

366. In total there are 93 sections of hedgerow that occur within the Order Limits, or within 5m of it, equating to 7.629km.

367. During construction 372m of hedgerow will be temporarily impacted, for example to make way for the construction haul road and compounds. In most instances only short (<10m) lengths of hedgerow will be temporarily removed and such small gaps would be unlikely to create a barrier to dispersal for the species of bats recorded during baseline surveys.

368. Where longer sections are to be removed, these hedges have been assessed for likely use

by bats and are considered unlikely to be functionally linked to any known potential or confirmed roosts, due to an absence of habitat connections to potential roosts in the wider area.

369. Temporarily impacted hedgerows will be reinstated following completion of works.

370. Although initially the loss of small sections of hedgerow may lead to low level disturbance of some commuting bats, the temporary loss of discrete sections of hedgerow totalling 372m within the Order Limits will have **a negligible negative effect** on the ability of the local bat population to move between roots and foraging areas.

Nathusius' Pipistrelle Migration

371. Low levels of Nathusius' pipistrelle activity were recorded across all segments within the Order Limits, with less than 100 bat passes recorded for this species per month. However, in October there was a peak of 821 recorded by the static at location 43 in ECC 10. It is possible that this peak is due to migratory behaviour by this species, although further and more specialist survey (such as netting to search for individual tagged in Europe or radio-tracking) would be required to establish this with a high level of confidence.

372. As no Nathusius' pipistrelle roosts were recorded within the Order Limits, the assessment of impacts focuses on potential impacts to flight lines, which have been discussed above.

Assessment of Effects

373. No significant effects are predicted for bat roost or foraging resources.

374. A detailed assessment of whether the Project is likely to result in licensable disturbance impacts on bats using habitats functionally linked to roosts is presented in OLEMS Annex A.3, section A.3.5, and should be read in conjunction with the following paragraphs. Taking into account the embedded mitigation committed to within the OLEMS, Annex A.3 concludes that no licensable disturbance effects are predicted to arise.

375. Temporary impacts to hedgerows during construction are not predicted to result in barriers to dispersal or isolation effects and impacts to migrating Nathusius' pipistrelle are not considered likely to be significant, as if these bats are able to cross The Channel, small gaps in hedgerows are considered unlikely to present a barrier to dispersal.

376. Planting around some hedgerows will lead to their loss as narrow linear habitats, but the edge of the planting blocks will become flight lines over time, and the increase in structural diversity will increase the value of these areas for foraging. Therefore, planting will lead to a **minor positive effect** on the local bat population.

Mitigation

377. Temporary hedgerow removal to accommodate the haul road and cable route will be minimised as much as practical at the detailed design stage to help avoid impacts.

378. During construction, where flight lines are temporarily lost, they will be replaced over the night-time period by artificial 'dead hedges' or similar. Pre-construction survey and assessment will be undertaken by a suitably experienced bat licenced ecologist to help identify where any artificial flight lines will be required. These will be designed to enable bat passage and be

installed prior to dusk and be left in-situ until after dawn.

379. Buildings located within 25 metres of the Order Limits were not subject to presence/ absence surveys and therefore it is not known if bat roost are present. It is unlikely that activities within the Order Limits would lead to disturbance effects on roosts outside the Order Limits, however the detailed design of the compounds is not available at the time of writing, and the exact nature of activities and equipment or plant to be used is not known. However, it is understood that there is some flexibility in terms of the internal layout, therefore the layout will be designed to accommodate an exclusion zone appropriate to avoid disturbance impacts on any potential bat roosts. This may include the use of measures such as acoustic fencing and restricted timings of any works will be implemented to ensure there are no indirect impacts on bat roosts in proximity to the Order Limits.

380. Taking the above mitigation measures into account **no significant effects** are predicted to arise on the local bat population as a result of the Project.

Badger

Impacts

381. For the purposes of assessing whether the Project would lead to impact on badgers, a buffer of 20m was applied to all setts confirmed in 2024. The rationale being that construction works within 20m of a sett carry a risk of disturbing badgers in residence.

382. Regarding potential impacts arising from enabling access tracks, it is understood that these routes will be used by at the very beginning of works, by tractors and trailers to transport construction machinery into the Order Limits, and that no modifications to the ground surface will be made, albeit that some vegetation removal will be undertaken. It is understood that such routes will be micro-sited to avoid ecological receptors and therefore can be routed to avoid land within 10m of all setts. Given the predominantly arable nature of the landscape, the disturbance baseline includes intermittent movements of large farm machinery. Therefore, where an enabling access track passes within 20m of a sett, the temporary use of such a track would be unlikely to lead to disturbance of badgers in residence.

383. As a result, enabling access tracks have been screened out of the impact assessment presented below.

384. Badger mitigation measures are set out below and committed to within the OLEMS.

385. Three setts were identified as being at risk of impacts and are discussed in the sections below. The locations of these setts in relation to the Order Limits and construction design are shown in Figure 21.7.

386. Sett 21 was confirmed as an active main sett in August 2024 and was recorded partly within the Order Limits, on the periphery of an area where the cable will be installed using trenchless techniques (directional drilling). Given the likely distance from the drilling route, which follows the centre line of the Order Limits), direct impacts to the sett are very unlikely.

387. However, c.10m to the northeast of the sett there is a cable installation compound (CIC253) which, in the absence of mitigation, could lead to noise and visual disturbance of badgers within the sett arising from construction activities.

388. Sett 23 was confirmed as an active main sett in August 2024, and was recorded wholly inside the National Grid Substation Search Area, within which, given the large area, it will be possible to microsite infrastructure in such a way as to avoid direct impacts. However, given the scale of the works in this area it has been assumed that, in the absence of mitigation, badgers would likely be subject to noise and visual disturbance arising from construction activity.

389. Sett 51 was confirmed as an active single-hole outlier sett and was located within the Order Limits, in an area where the cable will be installed using trenchless techniques (directional drilling) in order to avoid impacts upon the ditch. Given the likely distance from the drilling route, which follows the centre line of the Order Limits), direct impacts to the sett are very unlikely.

390. In the absence of mitigation, works within cable installation compounds (CIC271 and CIC272) located within 30m of Sett 51 have the potential to lead to noise and visual disturb impacts during construction activities.

391. The habitats impacted by the works are generally widespread and representative of those in the wider landscape and are not considered to be particularly unique or important as a foraging resource for badgers. The temporary loss of habitat during construction is unlikely to impact on the ability of badgers to forage successfully, as abundant alternative and similar habitat will be available.

392. No significant isolation or fragmentation effects are predicted to occur as badgers will be able to cross the Order Limits via strips of vegetation retained on land where trenchless techniques are employed. It is also considered unlikely that the open cut trench would prevent badger movement across the Order Limits as trenches will be a maximum depth of 3m with sloped sides which badgers would be able to climb.

Assessment of Effects

393. In summary, in the absence of mitigation, construction activities within HDD compounds occurring within 20m of setts could lead to disturbance of badgers occupying retained setts beyond the Order Limits. Badgers were valued as important at the site level only and so the predicted effect in not significant at the local level and is **not significant** in EIA terms. However, mitigation is included to ensure legal compliance.

Mitigation

394. No significant impacts are currently predicted on badger setts. However, pre-commencement surveys will be undertaken to search for new evidence of badger presence prior to the start of construction activities. Where pre-commencement surveys reveal new evidence of active setts that require closure, or where disturbance to setts is above the threshold stated in the governing legislation and associated good practice guidance, these activities will be completed under licence from NE, issued to an appropriately qualified

ecologist.

395. High visibility fencing will be erected within the Order limits to create exclusion zones at a minimum offset of 20m from all setts, within which no heavy vehicles or excavation by plant machinery would be permitted.

396. Acoustic and visual screening will be installed at a minimum distance of 20m from retained setts (Setts 21 and 51) along boundaries between the compounds (CIC253, 271 and 272), and the retained setts.

397. With regard to Sett 23, acoustic and visual screening would also be installed at the same minimum distance, to prevent disturbance impacts as required.

398. The exact layout of the screening will be reviewed at detailed design and determined in agreement with the ECoW. The acoustic/ visual screen could comprise off-the-shelf barriers, or a soil bund constructed using topsoil from the compound, or a combination of both.

399. During the construction phase, open-ended pipes and deep pits would be capped or have 'escape planking' fitted overnight to prevent badgers getting trapped. Potential toxic substances, such as chemical toilets and fuel/oils, would be secured to avoid accidental poisoning.

400. Based on the current baseline there is no requirement to prepare a draft badger licence at this stage, as no licensable impacts are predicted. However, works would adopt reasonable avoidance measures (RAMS) which would include the above mitigation measures and which would be further developed and informed by pre-commencement surveys.

Otter

Impacts

401. For the purposes of assessing impacts upon otter, a 30m disturbance buffer was used for individual commuting or foraging otters, and a precautionary 150m buffer was used for holts. Disturbance impacts to commuting otters, or otter occupying holts beyond these buffers are considered unlikely to occur.

402. There is a low resolution (hectare) desk study field observations located in ECC 1 which could have originated from within the Order Limits. The record location is in the same hectare square as Sea Banks Clay Pitts SSSI, and Anderby Creek, either of which, or both, likely provide a foraging resource for this species. No direct observations or evidence of otter were recorded during surveys in these areas and so intermittent foraging or commuting use is assumed.

403. The coastal habitats and watercourse 128 which connect Sea Bank Clay Pits and Anderby Creek in a north-south orientation will be retained, with PCC-1 set inland from these. The construction of PCC-1 will likely require redirection or culverting of several sections of watercourse (64, 73 and 84), however as the coastal habitat is being retained and not impacted, no significant isolation impacts are predicted at this location.

404. There is a desk study record from ECC 2 near to watercourse 442 (Willoughby High Drain), between Loft's Bridge (where Sloothyby High Lane crosses previously mentioned drain) and a

small lake. Feeding remains were also recorded during surveys on watercourse 443, a tributary of 442.

405. No direct impacts on either watercourse are predicted as trenchless techniques will be used to install cables beneath them. The standoff between the CIC compounds (CIC24/ CIC25 for watercourse 442 and CIC25/26 for watercourse 443) either side of the watercourses, and the edge of the watercourses is approximately 30m, which should be sufficient to prevent disturbance effects arising from construction activity within the compounds on any passing otter.

406. A potential couch was recorded at ECC 3: Marsh Lane to A158 - Skegness Road next to watercourse 624. It was recorded approximately 130m east of the Order Limits and therefore no direct impacts or disturbance effects are predicted. There are several lakes to the east and west, with habitat linkages this watercourse, and so it is likely that it is used by otters to commute to and from foraging areas. Trenchless techniques will be used for watercourse 624, with CIC compounds (CIC62/63) set back from the bank by approximately 30m. No significant disturbance effects are predicted at this location.

407. There are two desk study records in ECC 5 and a field survey record of an otter slide near to a bridge over the Wainfleet Relief Channel. No holts or couches were recorded in the vicinity.

408. No disturbance effects on commuting or foraging otter are predicted to arise as a result of the CIC compounds (CIC111 / 112) due to the large standoff (>50m), however the secondary construction compound (SCC-10) and the primary construction compound PCC-9 are located either side and within 20m of the watercourse. Further, work to reinforce the bridge between these two compounds is likely to affect the riverbanks and create noise and visual impacts directly above the river. In the absence of mitigation, there is potential for this work to lead to disturbance of commuting otter and isolation effects at this location.

409. A holt and feeding remains were recorded during surveys of Hobhole Drain in segment ECC 10. There is also a desk study result of otter for this watercourse, immediately north of the field survey record.

410. No direct impacts on Hobhole Drain are predicted as trenchless techniques will be employed. However, CIC246 is within 150m of the holt, and therefore, in the absence of mitigation, if this were a natal holt, construction activity within the compound could lead to significant disturbance effects (potentially sufficient to trigger an offence).

411. The two desk study records in ECC 13 originated from the River Welland and watercourse 1636, which is a tributary of the river. Otter footprints were also recorded during field surveys on a watercourse which contiguous with watercourse 1626.

412. Secondary compound SCC-28 is located at the convergence of the tributary and the River Welland, and is located in very close proximity (within 2m) to watercourse 1626 and watercourse 1621 which run in parallel and either directly into the River Welland, or indirectly via the Five Towns Drain. The construction haul road runs from CIC300, east following an existing farm track that runs parallel to, and approximately 15m from watercourse 1621. The construction haul road then crosses this watercourse, which will likely require the installation of

a culvert, to join the metalled road that runs parallel to the sea bank and the River Welland between the Five Towns pumping station and the Risegate Eau pumping station. In the wider area, much of the installation of cable with be via open trench, further increasing noise and visual disturbance in the area.

413. In the absence of mitigation, the close proximity of SCC-28 and the haul road to watercourses used by otter, and the location of it at a prominent confluence of watercourses, could lead to significant disturbance of otter commuting along these features and isolation effects are predicted at this location.

Assessment of Effects

414. In the absence of mitigation, the construction of the project is predicted to lead to disturbance and isolation effects on otters commuting along the Wainfleet Relief Channel, watercourses 1621 and 1623 and the River Welland. If the holt in ECC 10 associated with the Hobhole drain is a natal holt, disturbance could be sufficient to trigger an offence.

415. Otters have large ranges (around 10km, but some over 20km) such that those stretches of watercourse subject to disturbance likely represent only a very small proportion of their territory / available habitat. Abundant alternative watercourses are available to enable otters to continue to pass through the landscape, avoiding disturbed areas.

416. In addition, a large number of otter records were returned from within 2km of the Order Limits, and the most recent EA National Otter Survey (2010) indicates the population in the county is expanding. This indicates that the local population is likely strong, and resilient enough to overcome minor and localised disturbance events.

417. On balance, without mitigation, negative effects are predicted, however, due to the large range this species exhibits, the strength of the local population and the abundance of alternative commuting routes, **significant negative effects are predicted at the site level** only which is **not significant** in EIA terms. However, to ensure legal compliance, mitigation is presented below.

Mitigation

418. An assessment of whether the project would lead to any licensable impacts is presented in Annex A.4 of the OLEMS. Mitigation to avoid impacts on otter is committed to within the OLEMS.

419. In relation to the otter holt located on Hobhole Drain, which is situated 150 m from CIC246, acoustic and visual screening will be installed along the eastern perimeter of CIC246. This measure aims to minimise disturbance to any otters in residence and the wider otter population commuting along the Hobhole Drain.

420. Visual and acoustic screening will also be deployed along the perimeter of SCC-28, CIC300 and CIC301. The screening will be extended along the temporary access tracks as deemed necessary to ensure effectiveness. The inclusion of visual and acoustic screening at this location also serves to reduce disturbance impacts to a potential bat roost within T4954.

421. The precise configuration and layout of the screening will be subject to evaluation at the detailed design phase in consultation with the ECoW. The proposed acoustic/ visual mitigation measures may include the installation of commercially available barriers, as well as the construction of a soil bund utilizing topsoil sourced from within the compound. A hybrid approach, integrating both mitigation techniques, may be employed to optimize effectiveness and ensure disturbance is minimised.

422. In cases where the Project temporarily crosses a ditch that is likely to be used by otter, appropriate mitigation measures to encourage the continued use of that ditch by otter will be provided.

423. In summary, the mitigation measures for otter include employment of an ECoW, pre-commencement surveys, sensitive scheduling of work, minimising noise and control of lighting, reduced traffic speeds to 10mph, and the immediate re-instatement of habitats, as well as the securement of visual and acoustic screening in two sensitive areas of the Project. With this collective mitigation in place, disturbance levels are considered to be effectively minimised, with residual levels too low to consider it necessary to apply for an A45 licence to disturb otter.

Water vole

Impacts

424. In order to identify potential direct impacts on water vole and their burrows a 5m buffer has been applied. Impacts on watercourses where this species has been recorded within the Order Limits and the wider Study Area, have also been considered to assess whether isolation effects are likely or not.

425. A desk study record dating from 2009 was received, located within ECC 2 at CIC45, approximately 70m south of watercourse 558. It is likely the record originated from the watercourse, as this species is typically found within safe and sheltered riparian areas. Watercourse 558, and 555 and 562 which connect to it, were assessed as having moderate potential for water vole, but no evidence of this species was recorded during surveys in 2023. On the basis of the most recent survey data, it is likely that water vole / burrows are not resident on the impacted stretch of watercourse and no direct impacts are predicted at this location.

426. A single desk study record dating from 2009 was received in ECC 3, associated with either watercourse 628 or 630 (likely both), immediately adjacent to proposed enabling access track and approximately 150m due west of cable installation compound CIC68. Watercourse 628 and 630 were assessed as having low potential to support water vole and no evidence was recorded in 2023. On the basis of the most recent survey data, it is likely that water vole / burrows are not resident on the impacted stretch of watercourse and no direct impacts are predicted at this location.

427. Three desk study records were received in association with watercourse 641, in ECC 4, dating from 2012, 2013 and 2016. The exact record locations fall within proposed

infrastructure (CIC 71, SCC-7 and an enabling access track), although it is considered likely that water vole would remain within the riparian areas and avoid open arable fields. Watercourses 641 and adjoining 643 and 647, were assessed as having low potential for water vole, with no evidence of water vole recorded in 2023. On the basis of the most recent survey data, it is likely that water vole / burrows are not resident on the impacted stretch of watercourse and no direct impacts are predicted at this location.

428. A desk study record dating from 2017 was received within ECC 4, within an area proposed for CIC81, and approximately 28m north of watercourse 683 from which it likely originated. Watercourse 683 was assessed as having low potential for water vole and no evidence of this species was recorded in 2023. On the basis of the most recent survey data, it is likely that water vole / burrows are not resident in the impacted stretch of watercourse and no direct impacts are predicted at this location.

429. In ECC 5, there are a cluster of desk study records and a 2023 survey record of water vole burrow between cable installation compounds CIC89 and CIC93. It is likely that the desk study records are mainly associated with watercourse 750, although at least one, and the survey records of a water vole burrow are associated with watercourse 20004. The haul road crosses both watercourses and therefore, in the absence of mitigation, direct impacts such as killing or injury / obstruction, damage or destruction of water vole / their burrows could occur.

430. Further south in ECC 5 a single desk study record, dating from 2012 was received, located in an arable field, but likely associated with watercourse 20141 or 20142, which runs adjacent and immediately parallel to it. Both watercourses were assessed as having low potential to support water vole and no evidence was recorded in 2023. On the basis of the most recent survey data, it is likely that water vole / burrows are not resident in the impacted stretch of watercourse and no direct impacts are predicted at this location.

431. In ECC 6, 2023 field surveys recorded two water vole burrows on watercourse 20273, within the footprint of the proposed construction haul road, but otherwise in an area subject to trenchless techniques between CIC131/132. In the absence of mitigation, direct impacts such as killing or injury / obstruction, damage or destruction of water vole / their burrows could occur.

432. In ECC 12, 2023 field surveys recorded a water vole burrow associated with watercourse 1571, which runs parallel to a country lane. The proposed construction haul road is located less than 5m from the burrow record and therefore in the absence of mitigation, direct impacts such as killing or injury / obstruction, damage or destruction of water vole / their burrows could occur.

433. A review of the desk study records has identified the historic use of the following watercourses by water vole:

- ECC 1 (169, 163, 261 and 313),
- ECC2 (390, 402, 465, and 558);
- ECC 3 (584,596, 606, 611, 624 and 629);

- ECC 4 (641, 655, 678 and 682);
- ECC 5 (725, 734, 750, 20004, 20098, 20105, 20134, 20127 and 20150);
- ECC 6 (20149); and
- ECC 12 (1531 and 1547).

434. These watercourses are intersected by the construction haul road which will require the installation of culverts. Without sensitive design, these culverts could create barriers to dispersal, isolating water voles on either side of the culvert from each other.

Assessment of Effects

435. In the absence of mitigation, direct impacts on water vole / their burrows could occur at three discrete locations within ECC 6, 6 and 12.

436. For each watercourse, the area affected by culvert installation would be less than 10m, much less than a typical (female) water vole territory (that being between 30-150m depending on habitat quality). Therefore, it is likely that only one burrow / territory (and a maximum of two) would be impacted at each location. In the absence of mitigation, individual water voles could be killed or injured, which would be an offence, but the loss of individual or low numbers of water voles would be unlikely to lead to the extinction of the associated colony.

437. In addition to potential direct impacts, the installation of culverts could lead to isolation effects on water voles. Individual female water voles have small discrete territories such that it may not be easy for them to navigate around a barrier to dispersal, and the loss of access to part of their territory could lead to significant impacts on individuals. Males have larger territories which overlap those of several females, therefore barrier effects could affect breeding success and lead to impacts on the whole colony. Significant impacts to colonies within the Order Limits / at the site level could occur.

438. The high number of desk study records from land within 2km of the Order Limits suggest that the overall local population (that being comprised of multiple colonies) of water vole is large. Further, the LBAP (2011-2020 3rd Edition, Lincolnshire Biodiversity Partnership) states that '*The Lincolnshire water vole population appears to be stable, with a widespread distribution'.* Therefore, is unlikely that a significant effect would occur at the local level or above and any **effects are not significant in EIA terms.** However, mitigation is presented in order to ensure legal compliance and to ensure expansion of water vole populations from strongholds within the local area (for example Middlemarsh Farm LWS in ECC 3) is not inhibited during the construction of the Project.

Mitigation

439. Pre-construction surveys will be undertaken to confirm the location of known records and to identify the location of any new burrows.

440. The detailed design of the haul road and associated culverts will seek to avoid works within 5m of any water vole burrow.

441. Where impacts to burrows cannot be avoided, works will be progressed under a CL31

licence involving the displacement of individuals to suitable adjacent habitat. A CL31 licence can / will only be used in the (three) months March - April and September.

442. Where the haul road crosses watercourses which are utilised by water voles beyond the Order Limits, mitigation measures will be tailored to suit the size, water levels and flow rates of each ditch crossed, with details to be provided in a riparian crossing schedule in the EMP.

443. Removal of vegetation along watercourses which have been used by water voles will be undertaken carefully under supervision of a suitably experienced ECoW to ensure no individuals are injured or killed.

21.9.1.5 Impact 5: Spread of INNS

444. Baseline surveys did not identify any INNS as present within the Order Limits, but there remains potential for the construction phase of the project to cause the spread of INNS in the absence of mitigation. Embedded mitigation to reduce the risk of spread of INNS is included in the scheme (See Table 2116 above). With these measures in place, effects resulting from the spread of INNS is considered to be **not significant** in EIA terms.

21.9.2 Operations and Maintenance

21.9.2.1 Impact 6: Disturbance of protected and priority species during planned and unplanned maintenance works when the Project is operational.

445. During the operational period (anticipated to be approximately 35 years), scheduled and unscheduled monitoring and maintenance activities will be required. Preventive maintenance will be undertaken according to a service schedule, whereas corrective maintenance will be needed to cover unexpected repairs.

446. Onshore, the O&M requirements will be largely corrective, accompanied by infrequent on-site inspections of the Order Limits. Periodic access to TJBs may be required for inspection.

447. The OnSS will be an ordinarily unoccupied installation with no permanent on-site presence. Regular access will be required for routine maintenance activities and emergency repairs.

448. There may be O&M staff visiting the OnSS to undertake works when necessary. This would be highly localised within the OnSS with a minimal likelihood of disturbance expected to the adjacent habitats and species.

449. Maintenance activities will be subject to an EnMS which will include specific measures to avoid potential impacts to protected/ notable species. The EnMS would also include measures to minimise the risk of a pollution event. Following the implementation of an agreed EnMS, **no significant adverse effects** are anticipated for any important ecological features as a result of operation and maintenance activities.

21.9.3 Decommissioning

21.9.3.1 Impact 7: Impacts similar to construction, but more limited in geographical extent and timescale and there would be no permanent habitat loss.

450. At the end of the operational lifetime of the windfarm, it is expected that the onshore cable would be left in-situ to avoid adverse effects on the environment and communities. Any final decommissioning methodology will adhere to industry best practice, rules and regulations

at the time of decommissioning.

451. A Decommissioning Plan will be developed providing further details on the decommissioning of the Project in accordance with the Outline Decommissioning Plan submitted with the DCO application. Mitigation for any impacts, likely to be limited to potential disturbance to birds, would be in-line with that described for the construction phase impacts.

452. With most infrastructure expected to be left in situ and following the implementation of embedded mitigation measures, **no significant adverse effects** on ecological receptors are anticipated.

453. However, should the onshore infrastructure be removed, for the purposes of a worst-case scenario, it is considered that impacts associated with the decommissioning phase would be no greater than those identified for the construction phase.

21.9.4 Summary of Non-Embedded Mitigation Measures

454. Table 21.20 summarises those measures identified through the impact assessment process as required to address potentially significant effects in relation to IEFs.

Table 21.20 Non-Embedded Mitigation for Ecological Receptors

Ecological Receptor	Predicted impact pre mitigation	Mitigation Measures	Predicted impact post-mitigation	Significant in EIA terms?
Veteran Trees	Not assessed, not recorded in Order Limits	In order to mitigate the risk of loss of, or damage to veteran trees, final project design will seek to avoid boundary features wherever possible. Any tree that cannot be retained will be subject to pre-construction surveys to assess if ancient or veteran or not. Appropriate mitigation and compensation for any losses of veteran or ancient trees will be agreed with relevant stakeholders.	No significant effects	No
Rare arable weeds	Not assessed, not recorded in Order Limits	Alternatives to herbicides will be used wherever possible during the construction phase. Pre-construction surveys of suitable and impacted habitat will be undertaken where necessary.	No significant effects	No
Eels	No significant effect	The detailed design of the trenchless cable installation will be further refined at contract award, and therefore to mitigate impacts arising from any changes, an updated fish survey will be undertaken (if required), and specific mitigation measures in the EMP updated (where required) and agreed with relevant stakeholders. The fish impact assessment will be updated on receipt of detailed design for Cable Installation Compounds (CICs) and other infrastructure within close proximity to major watercourses.	No significant effects	No
GCN	Significant effect on metapopulation at ECC 6 (but negligible for amphibians as a group)	EPSL to cover works, RAMS for track matting installation/ removal.	No significant effects	No

Ecological Receptor	Predicted impact pre mitigation	Mitigation Measures	Predicted impact post-mitigation	Significant in EIA terms?
Reptiles	Negligible negative effect	Pre-construction surveys to tailor the siting of mitigation measures to the final project design including: RAMS covering sensitive vegetation clearance and destructive search, temporary artificial refugia provided during construction, safe underpasses where haul road leads to isolation effects, and where culverts are absent – Reptile Area 4.	No significant effects	No
Bats	Negligible negative effect (flight lines)	Use of artificial flight lines during construction, sensitive layout of compounds to avoid disturbance impacts on potential roosts (within and outwith the Order Limits), and use of acoustic fencing or hoarding where such impacts cannot be designed out.	No significant effects	No
Badger	No significant effect	Pre-construction surveys to tailor the siting of mitigation measures to the final project design, NE licence where impacts cannot be avoided, RAMS to guide works where setts retained.	No significant effects	No
Otter	Significant effect at site level only	Pre-construction surveys along all water courses which may be directly affected within or immediately adjacent to the Order Limits (250 m upstream/downstream of Order Limits). Camera trapping if otter holts are recorded. Use of acoustic and visual screening within sensitive locations prevent disturbance to adjacent watercourses, culverts installed in watercourses where otter have been recorded to incorporate crossing opportunities. NE licence where impacts cannot be avoided,	No significant effects	No
Water vole	Significant effect at site level only	Pre-construction surveys to inform detailed design, and NE licence if impacts cannot be avoided. Culverts installed in watercourses where water vole have been recorded to incorporate mammal ledges. Sensitive vegetation clearance along watercourses where water vole have been recorded.	No significant effects	No

21.10 Cumulative Impact Assessment

455. This cumulative impact assessment for Onshore Ecology has been undertaken in accordance with the methodology provided in Volume 1, Annex 5.1: Cumulative Impact Assessment Methodology. Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered cumulatively with impact of other proposed or permitted plans and projects, can result in significant effects.

456. The projects and plans selected as relevant to the assessment of impacts to Onshore Ecology are based upon an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved. Where no hydrological or ecological connection exists, the project or plan is located more than 1km from any part of the onshore ECC, or 5km from the centre of the OnSS area, or the plan or project has been considered for planning after 24/02/2025 (the cut off for identification of projects), these have been scoped out.

457. For the purposes of assessing the impact of the Project on Onshore Ecology in the region, the cumulative effect assessment technical note submitted through the EIA Evidence Plan and forming Volume 1, Annex 5.1 [cumulative effect methodology annex] of this ES, screened in a number of projects and plans as presented in Table 21.21.

Table 21.21 Projects considered within the Cumulative Ecological Impact Assessment

Development type	Project	Status	Data confidence assessment/phase	Tier
Housing 680m NW of Order Limits at ECC 10	B/20/0488 – 46 dwellings. Land adjacent to Fishtoft Scouts.	Outline planning decision – Favourable with conditions.	High – Biodiversity assessment (BNG) available. Ecological report is a two-page report scoping out ecological impacts.	Tier 1
Housing 800m NW of Order Limits at ECC 10	B/20/0489 – 20 dwellings. Land adjacent to Fishtoft Scouts.	Planning decision – Favourable with conditions.	High – Biodiversity assessment (BNG) available.	Tier 1
Housing 1.1km SE of Order Limits at ECC 9	B/21/0196 – 42 dwellings. Land to the rear of 1a - 15 Watery Lane. Original application ref. B/16/0465.	Approval of reserved matters – Favourable with conditions.	High. No ecological report with reserved matters application or original outline application. Not deemed necessary.	Tier 1
Housing 160m SW of Order Limits at ECC 12	B/21/0419 – 11 dwellings - Land off Puttock Gate	Outline planning – Favourable with conditions.	High. Ecology survey report available.	Tier 1

Development type	Project	Status	Data confidence assessment/phase	Tier
Housing 420m E of Order Limits at ECC 2	N/084/01712/22 – 89 dwellings. West End, Hogsthorpe. Original outline application - N/084/00809/19.	Reserved matters application – Registered.	High. No ecological report with reserved matters application. Ecology report available with original outline application.	Tier 1
Power Station 2.1km NW of Order Limits at ECC11	Boston Alternative Energy Facility (BAEF)	DCO application – consent granted July 2023.	High. DCO documents available.	Tier 1
Solar Farm 900m W of Order Limits at ECC 6	S/195/02340/20 - Low Farm 49.9MW Solar Farm.	Planning permission – Approved.	High – Ecological report available.	Tier 1
Substation Within RLB at ECC 14.	National Grid Substation at Weston Marsh	Pre-scoping.	Medium – ecological data for the area and basic design parameters available.	Tier 3
Plant based protein extraction facility and anaerobic digestor plant adjacent to OnSS	H17-1097-23 Naylor Farms, Land East of Surfleet Bank	Undecided	Medium – Design plans and statement available; biodiversity assessment not available.	Tier 2

458. The cumulative MDS for the Project is outlined in Table 21.22.

Table 21.22 Cumulative MDS

Impact	Scenario	Justification
Cumulative indirect impacts on protected sites	With the mitigation measures in place, it is considered that the Project would not materially contribute to cumulative air quality impacts (as detailed in Volume 1, Chapter 19 Onshore Air Quality) or water quality impacts (as detailed in Volume 1, Chapter 24: Onshore Hydrology, Hydrogeology and Flood Risk).	
Cumulative loss (permanent or temporary) of priority habitats	Whilst the impact from loss of habitat as a result of the Project will predominantly be a temporary impact during the construction phase only, with habitats reinstated on completion of works, permanent infrastructure will occupy an area of approximately 18.2 Ha plus 0.34 km of linear infrastructure. The impact from the eight cumulative projects will predominantly be permanent loss.	Four of the housing schemes will each result in the permanent loss of a small area of arable land, either part of an arable field or up to a single arable field. The fifth housing scheme will result in the loss of hardstanding, buildings and a paddock. Low Farm Solar Farm would result in the permanent loss of approximately 70ha of arable land. The net impact was assessed as minor positive, through provision of grassland habitat. BAEF would result in the permanent loss of 810m hedgerow, 0.14ha semi-natural broadleaved woodland, 2.7ha of semi-improved neutral grassland, 1.54ha of mudflat and 0.99ha of saltmarsh. Eight hectares of arable will also be lost and not directly compensated. A landscape mitigation planting scheme will be delivered, including enhancement of retained hedgerows and replacement of lost hedgerows. The National Grid Substation NGSS will be located within the onshore ES boundary at Weston Marsh South (the western terminus of the 400kv route). Design details are not available at this stage, but the assumptions include a footprint of approximately 800m by 200m plus temporary working area.

Impact	Scenario	Justification
		The habitats in this area are predominantly arable habitats of low ecological value. The Naylor Farms Protein Plant will be located at Surfleet Marsh and is a 14.3ha site currently managed as a cabbage field, which is habitat of low ecological value.
Cumulative impacts on protected species	In the absence of mitigation the Project could lead to significant effects on GCN, otter and water vole at the site level, and lead to negligible effects on commuting bats. The impact from the eight cumulative projects will predominantly be on bat commuting and foraging habitat, although impacts on otter are also possible within the NGSS area.	The Ecology reports for two of the housing schemes identified potential for impacts to habitats likely used by commuting bats. No potential impacts to GCN, otter or water vole were reported. The Ecology Chapter for the BAEF project identified impacts on bat commuting and foraging habitat, but no negative effects were predicted for GCN, otter or water vole. The Ecological Impact Assessment for Low Farm Solar Farm predicted positive effects for bats. No negative effects were predicted for GCN, otter or water vole. Surveys undertaken for the Project partially covered the NGSS and recorded an otter holt in the centre of the study area.
Cumulative operational impacts	Given that operational phase impacts arising from the Project are expected to be very minor, they would not materially contribute to cumulative disturbance impacts which could adversely affect important bird populations.	
Cumulative decommissioning impacts	It is assumed that the onshore cables will be left in situ once the Project ceases operation and, therefore, onshore decommissioning impacts would be largely restricted to the OnSS and, therefore, the potential for impacts to important ecological features would be of very limited spatial extent.	The five housing schemes do not have restricted operational lifespans and are expected to remain in place beyond the 35-year minimum operational life of the Project. It is expected that the operational life of the Low Farm Solar Farm and BAEF project would be 25 years and, therefore, do not overlap temporally with decommissioning for the Project.

Impact	Scenario	Justification
		The National Grid OnSS may be decommissioned once the Project ceases operation, although is more likely to be retained as part of the national electricity transmission network since it will support other connections in the area beyond the Project.

459. On balance, the mitigation proposed for each project should ensure that there are no residual effects in the medium to long term and therefore no cumulative effects are predicted to arise.

21.11 Inter-Relationships

460. Table 21.23 sets out the inter-relationships between this chapter and others within the ES. Inter-relationships are also discussed in Sections 9 and 10 in relation to Impact 1.

Table 21.23 Inter-relationships between Onshore Ecology and other chapters within the ES

Chapter	Details of inter-relationship
Chapter 12: Intertidal and Offshore Ornithology	This chapter assesses impacts on birds in the intertidal and offshore environments resulting from development activities occurring below MHWS.
Chapter 19: Onshore Air Quality	This chapter considers air quality impacts during construction to sensitive ecological features, including sites designated for their bird populations, as a result of dust and increased road traffic.
Chapter 22: Onshore Ecology	This chapter addresses impacts on onshore ornithological features and sites designated for biodiversity.
Chapter 24: Hydrology, Hydrogeology and Flood Risk	This chapter provides a description of the hydrological setting of water courses and water bodies within the survey area, including those used by important bird populations, and assesses impacts upon them.

21.12 Interactions

461. An assessment of whether the impacts identified and assessed in this chapter have the potential to interact with each other is detailed below. Inter-related effects consider impacts from the construction, operation or decommissioning of the Project on the same receptor (or group).

462. Such inter-related effects include both:

- Project lifetime effects: i.e., those arising throughout more than one phase of the project (construction, operation, and decommissioning) to interact to potentially create a more significant effect on a receptor than if just one phase were assessed in isolation; and,
- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor (or group). Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

463. A description of the process to identify and assess these effects is presented in Part 6, Volume 1 Chapter 5: EIA Methodology, with a summary of assessed inter-relationships provided in Table 21.24 below.

Table 21.24 Summary of Assessed Inter-Relationships

Project phase(s)	Nature of inter-related effect	Assessment alone	Inter-related effects assessment
Project-lifetime effects			
Construction, operation and decommissioning	Loss of priority habitat	No significant adverse effect. Most temporary loss would occur during the construction phase, with no loss during operation and only temporary loss during the decommissioning phases.	Temporary loss of priority habitat would be very minor during decommissioning phase, and therefore not interact substantively with the main impact arising during the construction phase.
Construction, operation and decommissioning	Disturbance to IEFs occurring during the three phases.	No significant adverse effect. Most disturbance would occur during the construction phase and it is expected that the disturbance impact would be much lower during the operation and decommissioning phases.	Disturbance impacts to IEFs would be very minor during the operation and decommissioning phases, and therefore not interact substantively with the main impact arising during the construction phase.
Receptor led effects			
All of the identified impacts could interact, however the two main sources of potential impact to IEFs are habitat loss and disturbance during the construction phase. These two impacts combined could lead to the displacement of IEFs from the Order Limits, and beyond. However, with the embedded and non-embedded mitigation implemented, impacts would be much reduced and would not result in significant effects.			

21.13 Transboundary Effects

464. The potential for transboundary effects on onshore IEFs to occur is limited to potential impacts to Nathusius' pipistrelle bat which was recorded as potentially migrating. Taking into account the embedded and additional mitigation and the enhancement measures to be implemented, it is concluded that the Project would not result in transboundary effects on any bat populations.

21.14 Conclusions

465. A summary of effects on important ecological features and measures to ensure compliance with relevant legislation is presented in Table 21.25 below.

Table 21.25 Summary of Potential Impacts on Onshore Ecology

Description of Effect	Effect	Additional Mitigation Measures	Residual Impact
Construction			
Impact 1: Indirect impacts on designated sites			
Impacts to air and water quality	With embedded mitigation no effects predicted	Not Applicable – no additional mitigation identified.	No residual effect
Impact 2: Permanent loss of priority habitat			
Loss of habitat	Minimal loss of priority habitat predicted	In order to mitigate the risk of loss of, or damage to veteran trees, any tree that cannot be retained will be subject to pre-construction surveys to assess if ancient or veteran or not. Appropriate mitigation and compensation for any losses of veteran or ancient trees will be agreed with relevant stakeholders.	No residual effect
Impact 3: Temporary loss of priority habitat			
Loss of habitat	Minimal temporary loss of priority habitat predicted	None proposed	No residual effect
Impact 4: Impacts on protected and priority species			
Rare arable weeds	Not recorded	Alternatives to herbicides will be used wherever possible during the construction phase. Pre-construction surveys of suitable and impacted habitat will be undertaken where necessary.	No residual effect
Invertebrates	No significant effect	None proposed	No residual effect
Eels	No significant effect	EPSL to cover works, RAMS for track matting installation / removal.	No residual effect
Amphibians	Significant effect on metapopulation at ECC 6 (but negligible for amphibians as a group)	NE licence	No residual effect
Reptiles	Negligible negative effect	Pre-construction surveys to inform assessment of impacts of detailed design, RAMS covering sensitive vegetation clearance and destructive search, temporary artificial refugia provided	No residual effect

Description of Effect	Effect	Additional Mitigation Measures	Residual Impact
		during construction, safe underpasses where haul road leads to isolation effects, and where culverts are absent – Reptile Area 4.	
Bats	Negligible negative effect	Use of artificial flight lines during construction, sensitive layout of compounds to avoid disturbance impacts on potential roosts (within and outwith the Order Limits), and use of acoustic fencing or hoarding where such impacts cannot be designed out.	No residual effect
Badger	No significant effect	Pre-construction surveys to inform assessment of impacts of detailed design, NE licence where impacts cannot be avoided, RAMS to guide works where setts retained.	No residual effect
Otter	Significant effect at site level only	Pre-construction surveys along all water courses which may be directly affected. Camera trapping if otter holts are recorded. Use of acoustic and visual screening within sensitive locations prevent disturbance to adjacent watercourses, culverts installed in watercourses where otter have been recorded to incorporate crossing opportunities. NE licence where impacts cannot be avoided,	No residual effect
Water vole	Significant effect at site level only	Pre-construction surveys to inform detailed design, and NE licence if impacts cannot be avoided. Culverts installed in watercourses where water vole have been recorded to incorporate mammal ledges. Sensitive vegetation clearance along watercourses where water vole have been recorded.	No residual effect
Impact 5: Spread of INNS			
Habitat and species	No significant effect; no INNS identified within Order Limits.	Biosecurity measures provided in the OLEMS (Document Reference 8.10) as a precaution.	No residual effect
Operation and Maintenance			
Impact 6: Disturbance of protected and priority species			
All IEFs	No significant effect	Maintenance activities will be subject to an EnMS which will include specific measures to avoid potential impacts to protected/	No residual effect

Description of Effect	Effect	Additional Mitigation Measures	Residual Impact
		notable species. The EnMS would also include measures to minimise the risk of a pollution event. Following the implementation of an agreed EnMS, no significant adverse effects are anticipated for any important ecological features as a result of operation and maintenance activities.	
Decommissioning			
Impact 7: Decommissioning Impacts			
All IEFs	Impacts predicted to be similar to construction phase.	Predicted to be similar to that required for construction phase.	No residual effect
Cumulative			
All IEFs		No additional mitigation identified	No residual effect

References

Baker, S., Barnes, C., Bouic, A. and Smith, F. (2016) Scarce arable plants: An assessment of current status in Greater Lincolnshire Greater; Greater Lincolnshire Nature Partnership, Lincolnshire

Bat Conservation Trust (2018) Guidance Note 08/18 Bats and artificial lighting in the UK at https://www.bats.org.uk/our-work/buildings-planning-and-development/lighting (bats.org.uk)

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

British Dragonfly Society Website [redacted] [Accessed 24th November 2023].

Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020). 'The UK Habitat Classification User Manual Version 1.1' at [redacted]

Butterfly Conservation Trust Website. [redacted] Accessed 21st November 2023].

Chartered Institute of Ecology and Environmental Management, (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.2 Updated April 2022.

Cheffings, C.M. & Farrell, L., Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J. and Taylor, I. (2005) The Vascular Plant Red Data List for Great Britain. Species Status No. 7. JNCC, Peterborough.

CIRIA (2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532).

CIRIA (2015) SuDS Manual (C753).

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists. Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London.

Department for Energy Security and Net Zero (2023) Overarching National Policy Statement for Energy (EN-1) EN-1 Overarching National Policy Statement for Energy (publishing.service.gov.uk) [Accessed February 2024].

Department for Energy Security and Net Zero (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3) National Policy Statement for renewable energy infrastructure (EN-3) - GOV.UK (www.gov.uk) [Accessed February 2024].

Department for Energy Security and Net Zero (2023) National Policy Statement for Electricity Networks Infrastructure (EN-5) National Policy Statement for electricity networks infrastructure (EN-5) - GOV.UK (www.gov.uk) [Accessed February 2024].

Department for Environment, Food and Rural Affairs (2020) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf [Accessed 13th November 2023].

Department for Environment, Food and Rural Affairs (2011) Natural Environment White Paper. https://www.gov.uk/government/publications/natural-environment-white-paper-implementation-updates [Accessed 13th November 2023].

Department for Environment, Food and Rural Affairs (2014) Request for Information: Badger Population Size and bTB Incidence. https://assets.publishing.service.gov.uk/media/5a7df85540f0b6230268850f/6488.pdf [Accessed 20th November 2023].

Department for Environment, Food and Rural Affairs (2009) Safeguarding our Soils. A Strategy for England. Available at https://assets.publishing.service.gov.uk/media/5a795b71ed915d0422067beb/pb13297-soil-strategy-090910.pdf [Accessed 20th February 2024].

Eaton, M. Aebischer, N. Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregor, R. (2015) Birds of conservation concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708-74.

East Lindsey District Council (2018) East Lindsey Core Strategy https://www.e-lindsey.gov.uk/media/9791/Core-Strategy/pdf/Core_Strategy_adopted_version_for_web.pdf [Accessed 20th November 2023].

English Nature, (2001) Great Crested Newt Mitigation Guidelines. English Nature.

Environment Agency Website. Catchment Data Explorer Anderby Main Drain | Catchment Data Explorer | Catchment Data Explorer [Accessed 9th November 2023].

Environment Agency (2010) Fifth Otter Survey of England: 2009-2010. Available at [redacted] [Accessed 20th February 2024].

Schofield, C. (2013). Newts: An assessment of current status in Greater Lincolnshire. GLNP, Lincolnshire.

Harris, S., Cresswell, P. & Jefferies, D.J. (1989). Surveying Badgers. The Mammal Society.

Institute of Environmental Assessment, (1995) Guidelines for Baseline Ecological Assessment.

IUCN (2012) Guidelines for Application of IUCN Red List Criteria at Regional and National Levels. Version 4.0. IUCN, Gland.

IUCN (2012) Red List Categories and Criteria. Version 3.1. Second editions. IUCN, Gland.

IUCN (2016) Guidelines for Appropriate Uses of IUCN Red List Data. Version 3.0. Adopted by the IUCN Red List Committee.

IUCN (2019) Guidelines for Using the IUCN Red List Categories and Criteria. Version 14. Prepared by the Standards and Petitions Subcommittee.

Joint Nature Conservation Council Website https://data.jncc.gov.uk/data/ [Accessed 5th November 2022].

Joint Nature Conservation Council Website. UK BAP Priority Habitats. UK BAP Priority Habitats | JNCC - Adviser to Government on Nature Conservation [Accessed 13th November 2023].

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

Johnson, M. (1982) Atlas of Mammals, Reptiles and Amphibians of Lincolnshire and South Humberside. Lincolnshire Naturalists' Union.

Joint Nature Conservation Council (2019), UK BAP Priority Habitats. UK BAP Priority Habitats | JNCC - Adviser to Government on Nature Conservation [Accessed 13th November 2023].

Judge, J., Wilson, G., Macarthur, R., McDonald, R. and Delahay, R. (2017) Abundance of badgers (*Meles meles*) in England and Wales. [redacted] [Accessed 20th November 2023].

Lincolnshire Biodiversity Partnership (2011) Lincolnshire Biodiversity Action Plan 2011-2020 (3rd Edition) Available at: 201110-LincolnshireBAP-3rd-edition.pdf (nelincs.gov.uk) [Accessed 20th November 2023].

Mammal Society – Species Hub – Common Shrew (undated) [redacted] [Accessed 20th February 2024]

National Planning Policy Framework (March 2012) https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed 19th November 2023].

Natural England, (2015) Great crested newts: surveys and mitigation for development projects. Natural England Standing Advice. Oldham R.S., Keeble J., Swan M.J.S. and Jeffcote M. (2000) Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143-155.

Natural England Standing Advice available at https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects

Natural England (undated) General descriptions for Special Area of Conservation features and Special Protection Area supporting habitats (https://assets.publishing.service.gov.uk/media/5a80008440f0b62305b88943/SAC-feature-descriptions.pdf)

Natural England (2020) 23. Coastal floodplain and grazing marsh. Climate Sensitivity Adaptation Manual (Second Edition)

Neal, E. G. & Cheeseman, C. (1996) *Badgers*. Poyser Natural History, London

Oldham, R.S., Keeble, J., Swan, M.J.S and Jeffcote, M (2000). Evaluating the suitability of habitat for the great crested newt (Triturus cristatus). Herpetological Journal, 10, 143-155.

Outer Dowsing Ltd. (2022a) Outer Dowsing Offshore Wind Farm Environmental Impact Assessment Scoping Report.

Outer Dowsing Ltd. (2022b) Outer Dowsing Offshore Wind Farm Habitats Regulations Assessment Screening Report.

Plantlife Website. [redacted] [Accessed 20th February 2024].

Reading, Chris & Jofré, Gabriela. (2009). Habitat selection and range size of grass snakes *Natrix natrix* in an agricultural landscape in southern England. Amphibia-Reptilia. 30. 379-388.

Rumsey, F.J. and Spencer, M. (2012) Is Equisetum Ramosissimum (Equisetaceae: Equisetophyta) Native to the British Isle? Fern Gax. 19(2):37-46. Available at [redacted] [Accessed 20th February 2024].

South East Lincolnshire Joint Strategic Planning Committee (2019) South East Lincolnshire Local Plan 2011-2036. [redacted] [Accessed 17th November 2023].

Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. 2014. A Vascular Plant Red List for England. Bristol: Botanical Society of Britain and Ireland.

The Planning Inspectorate (2022) Scoping Opinion: Proposed Outer Dowsing Offshore Wind. Case Reference: EN010130.

UKHab Ltd. [redacted] [Accessed 9th May 2023] and UKHab v2.0 (31st July 2023)

Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M.C., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. and Foster, G. (2018). Pantheon - database version 3.7.6 at: [redacted] [Accessed 03/10/2023].

Wembridge, D., Johnson, G., Al-Fulaij, N and Langton, S. (2002) The State of Britain's Hedgehogs 2022. Available at [redacted] [Accessed 22nd November 2023].