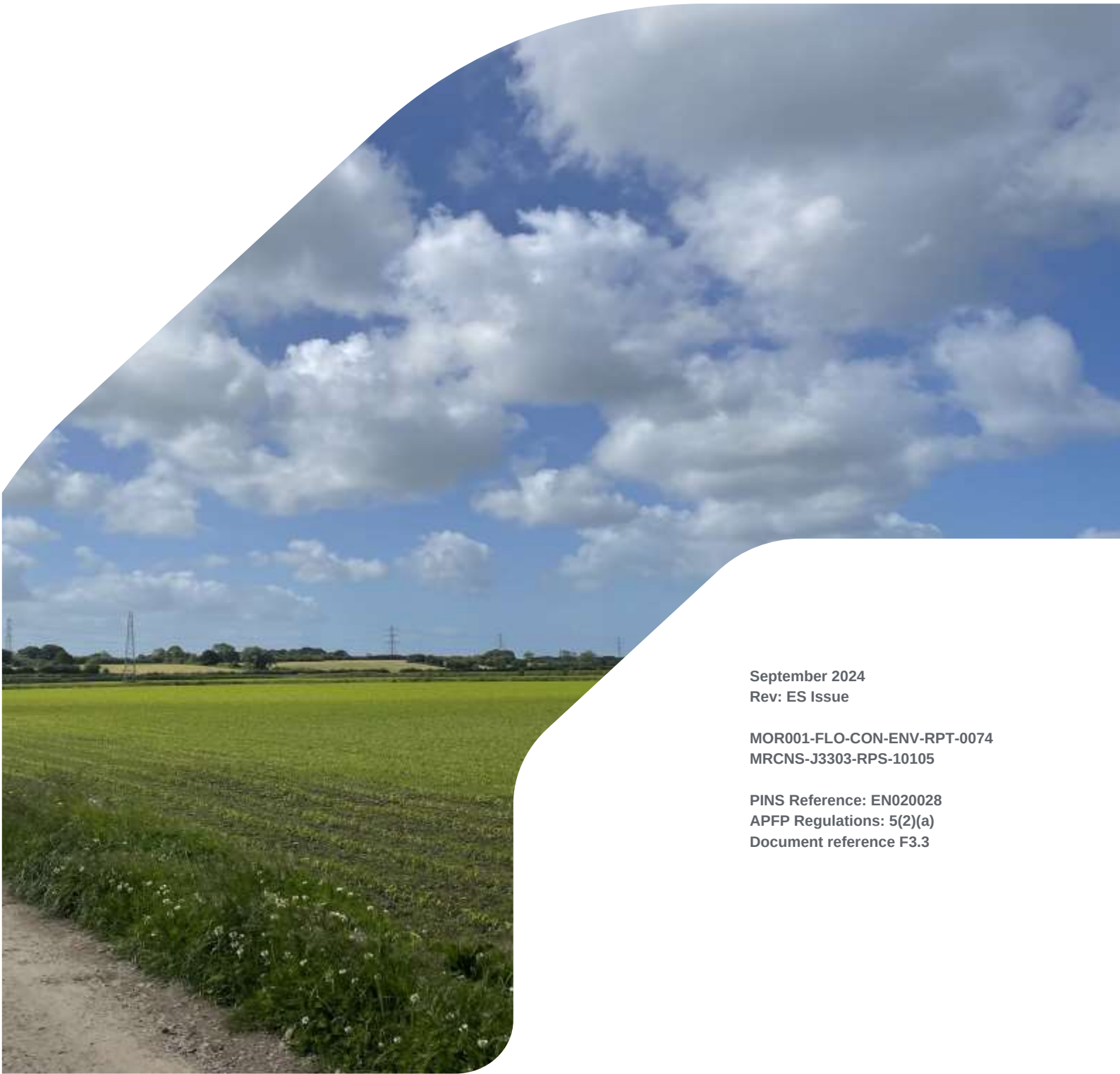
MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 3, Chapter 3: Onshore ecology and nature conservation



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Glossary

Term	Meaning
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Baseline	The status of the environment without the Transmission Assets in place.
Biodiversity benefit	An approach to development that leaves biodiversity in a better state than before. 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. For the Transmission Assets, biodiversity benefit will be delivered within identified biodiversity benefit areas within the Onshore Order Limits. Further qualitative benefits to biodiversity are proposed via potential collaboration with stakeholders and local groups, contributing to existing plans and programmes, both within and outside the Order Limits.
Candidate Special Areas of Conservation	Areas that were submitted to the European Commission as candidates for designation as a Special Area of Conservation before the end of the Transition Period following the UK's exit from the European Union, but not yet formally designated. See also Special Areas of Conservation.
Climate change	A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.
Code of Construction Practice	A document detailing the overarching principles of construction, contractor protocols, construction-related environmental management measures, pollution prevention measures, the selection of appropriate construction techniques and monitoring processes.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in this Environmental Statement. Secondary commitments are incorporated to reduce effects to environmentally acceptable levels following initial assessment.
Cumulative Effects	The combined effect of the Transmission Assets in combination with the effects from other proposed developments, on the same receptor or resource.
Design envelope	A description of the range of possible elements and parameters that make up the Transmission Assets options under consideration, as set out in detail in Volume 1, Chapter 3: Project Description. This envelope is used to define the Transmission Assets for EIA purposes when the exact engineering parameters are not yet known. This is also referred to as the Maximum Design Scenario or Rochdale Envelope approach.

Term	Meaning
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Duration (of impact)	The time over which an impact occurs. An impact may be described as short, medium or long-term and permanent or temporary.
Effect	The term used to express the consequence of an impact. The significance of effect is determined by correlating magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
EIA Scoping Report	A report setting out the proposed scope of the Environmental Impact Assessment process. The Transmission Assets Scoping Report was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan and Morecambe Offshore Windfarms Transmission Assets in October 2022.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
European Protected Species	Species (such as bats, GCN, otters and dormice) which receive full protection under The Conservation of Habitats and Species Regulations 2017 and Conservation of Offshore Marine Habitats and Species Regulations 2017.
European sites	Designated nature conservation sites which include the National Site Network (designated within the UK) and Natura 2000 sites (designated in any European Union country). This includes Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the EIA and Habitats Regulations Assessment processes for certain topics.
Expert Working Group	A forum for targeted engagement with regulators and interested stakeholders through the Evidence Plan Process.
Favourable Conservation Status	The situation in which a habitat or species is thriving throughout its natural range and is expected to continue to thrive into the future.
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines, inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).
Impact	Change that is caused by an action/proposed development, e.g., land clearing (action) during construction which results in habitat loss (impact).

Term	Meaning
Important Ecological Feature	Those features that are important and should be subject to detailed assessment, as explained in the Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).
Inter-related Effects	Inter-related effects arise where an impact acts on a receptor repeatedly over time to produce a potential additive effect or where a number of separate impacts, such as noise and habitat loss, affect a single receptor.
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bays inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Littoral sediment	Habitats of shingle (mobile cobbles and pebbles), gravel, sand and mud or any combination of these which occur in the intertidal zone.
Maximum design scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Mitigation measures	This term is used interchangeably with Commitments. The purpose of such measures is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects.
Morecambe OWL	Morecambe Offshore Windfarm Ltd is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan OWL	Morgan Offshore Wind Limited is a joint venture between bp Alternative Energy investments Ltd. and Energie Baden-Württemberg AG (EnBW).
National Policy Statement(s)	The current national policy statements published by the Department for Energy Security and Net Zero in 2023 and adopted in 2024.
National Site Network	The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 have created a National Site Network on land and at sea, including both the inshore and offshore marine areas in the UK. The National Site Network includes existing Special Areas of Conservation and Special Protection Areas alongside new Special Areas of Conservation and Special Protection Areas designated under these Regulations.

Term	Meaning
Offshore Order Limits	See Transmission Assets Order Limits: Offshore (below).
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore Infrastructure Area	The area within the Transmission Assets Order Limits landward of Mean High Water Springs. Comprising the offshore export cables from Mean High Water Springs to the transition joint bays, onshore export cables, onshore substations and 400 kV grid connection cables, and associated temporary and permanent infrastructure including temporary and permanent compound areas and accesses. Those parts of the Transmission Assets Order Limits proposed only for ecological mitigation/biodiversity benefit are excluded from this area.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
Protected species	A species of animal or plant which it is forbidden by law to harm or destroy.
Ramsar sites	Wetlands of international importance that have been designated under the criteria of the Ramsar Convention. In combination with Special Protection Areas and Special Areas of Conservation, these sites contribute to the national site network.
Reversibility	A reversible impact is one where recovery is possible naturally in a relatively short time period, or where mitigation measures can be effective at reversing the impact. An irreversible impact may occur when recovery is not possible within a reasonable timescale, or there is no reasonable chance of action being taken to reverse it.
Scoping Opinion	Sets out the Planning Inspectorate's response (on behalf of the Secretary of State) to the Scoping Report prepared by the Applicants. The Scoping Opinion contains the range of issues that the Planning Inspectorate, in consultation with statutory stakeholders, has identified should be considered within the Environmental Impact Assessment process.
Sensitivity	The degree to which an Important Ecological Feature is affected by a given impact, determined by its vulnerability to the impact.
Special Areas of Conservation	A site designation specified in the Conservation of Habitats and Species Regulations 2017. Each site is designated for one or more of the habitats and species listed in the Regulations. The legislation requires a management plan to be prepared and implemented for each SAC to ensure the favourable conservation status of the habitats or

Term	Meaning
	species for which it was designated. In combination with Special Protection Areas and Ramsar sites, these sites contribute to the national site network.
Special Protection Areas	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. Special Protection Areas contribute to the national site network.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Survey area	The area within which each survey has been undertaken. This may differ from the Study Area as a Survey Area will be based on species or survey-specific guidance on the extent of survey required, which may be limited by, for example, habitat conditions, or be defined in terms of buffer areas around an area of potential impact.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).
Transmission Assets Order Limits	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning
Transmission Assets Order Limits: Offshore	The area within which all components of the Transmission Assets seaward of Mean Low Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning. Also referred to in this report as the Offshore Order Limits, for ease of reading.
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.
Vulnerability	The characteristics of an Important Ecological Feature that determines its sensitivity to its effect.

Acronyms

Acronym	Meaning
BAP	Biodiversity Action Plan
BHS	Biological Heritage Site
BNG	Biodiversity net gain
CEA	Cumulative Effects Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment, Food & Rural Affairs
DLL	District Level Licensing
eDNA	Environmental DNA
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
EMP	Ecological Management Plan
EWG	Expert Working Group
GCN	Great Crested Newt
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Assessment
IEF	Important Ecological Features
IEMA	Institute for Environmental Management and Assessment
INNS	Invasive Non-native Species
ISAA	Information to Support Appropriate Assessment
JNCC	Joint Nature Conservation Committee
LERN	Lancashire Environment Record Network
LNR	Local Nature Reserve
LNR	Local Nature Recovery Strategies
MAGIC	Multi-Agency Geographic Information for the Countryside
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
NNR	National Nature Reserve
NOx	Nitrogen oxides
NPPF	National Planning Policy Framework

Acronym	Meaning
NPS	National Policy Statement
NVC	National Vegetation Classification
PC	Process contribution
PEC	Predicted environmental concentration
PEIR	Preliminary Environmental Information Report
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
SAC	Special Area of Conservation
SCI	Site of Community Importance
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom

Units

Unit	Description
m^3	Cubic Metre
ha	Hectare
km	Kilometres
km^2	Kilometres Squared
kV	Kilovolt
m	Metre
%	Percentage
m^2	Square Metre

3 Onshore ecology and nature conservation

3.1 Introduction

3.1.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA) undertaken for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. For ease of reference, the Morgan and Morecambe Offshore Wind Farms Transmission Assets are referred to in this chapter as the 'Transmission Assets'. This ES accompanies the application to the Planning Inspectorate for development consent for the Transmission Assets.

3.1.1.2 The purpose of the Transmission Assets is to connect the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (referred to collectively as the 'Generation Assets') to the National Grid. A description of the Transmission Assets can be found in Volume 1, Chapter 3: Project description of the ES.

3.1.1.3 This chapter considers the likely impacts and effects of the Transmission Assets on onshore ecology and nature conservation during the construction, operation and maintenance and decommissioning phases. Specifically, it relates to the onshore elements of the Transmission Assets landward of Mean High Water Springs (MHWS). Those elements of the Transmission Assets located seaward of MHWS are addressed in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES.

3.1.1.4 This ES chapter:

- identifies the key legislation, policy and guidance relevant to onshore ecology and nature conservation;
- details the EIA scoping and consultation process undertaken to date for onshore ecology and nature conservation;
- confirms the study area for the assessment, the methodology used to identify baseline environmental conditions and sets out the existing and future environmental baseline conditions, established from desk studies, surveys and consultation;
- identifies the scope of the assessment;
- details the mitigation and/or monitoring measures that are proposed to prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process;
- defines the project design parameters used to inform for the impact assessment;
- identifies the impact assessment methodology and presents an assessment of the likely impacts and effects in relation to the construction, operation and maintenance and decommissioning phases of the Transmission Assets on onshore ecology and nature conservation (and, where relevant, the impacts and effects of onshore ecology on the Transmission Assets); and

- identifies any cumulative, transboundary and/or inter-related effects in relation to the construction, operation and maintenance and decommissioning phases of the Transmission Assets on onshore ecology.

3.1.1.5 The assessment presented is informed by the following technical chapters and reports and should be read in conjunction with:

- Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES;
- Volume 3, Chapter 2: Hydrology and flood risk of the ES;
- Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES;
- Volume 3, Chapter 6: Land use and recreation of the ES;
- Volume 3, Chapter 8: Noise and vibration of the ES;
- Volume 3, Chapter 9: Air quality of the ES; and
- the Information to Support the Appropriate Assessment (ISAA) report prepared to accompany the ES (document references E2.1, 2.2, 2.3).

3.1.1.6 This chapter also draws upon additional information to support the assessment contained within the following annexes:

- Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES;
- Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report of the ES;
- Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report of the ES;
- Volume 3, Annex 3.4: River morphology survey technical report of the ES;
- Volume 3, Annex 3.5: Aquatic invertebrate survey technical report of the ES;
- Volume 3, Annex 3.6: Terrestrial invertebrate survey technical report of the ES;
- Volume 3, Annex 3.7: Fish and eel survey technical report of the ES;
- Volume 3, Annex 3.8: Great crested newt and reptile survey technical report of the ES;
- Volume 3, Annex 3.9: Water vole survey technical report of the ES;
- Volume 3, Annex 3.10: Bat activity survey technical report of the ES;
- Volume 3, Annex 3.11: Bat roost survey technical report of the ES;
- Volume 3, Annex 3.12: Otter survey technical report of the ES;
- Volume 3, Annex 3.13: Badger survey technical report of the ES;
- Volume 3, Annex 3.14: Invasive non-native species technical report of the ES; and

- Volume 3, Annex 3.15: White-clawed crayfish survey technical report.

3.1.1.7 This chapter of the ES excludes the assessment of effects on ornithology, which is reported separately in Volume 3, Chapter 4: Onshore and intertidal ornithology and in Volume 2, Chapter 5: Offshore ornithology of the ES. Impacts on geodiversity are set out in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of this ES. Impacts on peat as a resource are considered in Volume 3, Chapter 6: Land use and recreation of this ES.

3.2 Legislation, policy and guidance

3.2.1 Legislation

3.2.1.1 A range of legislation provides protection to habitats and species at an international, national and local level. The legislation relevant to this chapter is set out below.

The Conservation of Habitats and Species Regulations 2017

3.2.1.2 European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive') sets out provisions for the protection of habitats and species within the European Union (EU).

3.2.1.3 The Conservation of Habitats and Species Regulations 2010 were the principal means by which the Habitats Directive was transposed into English law. The Conservation of Habitats and Species Regulations 2017 consolidated and updated the Conservation of Habitats and Species Regulations 2010. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 then amended the Conservation of Habitats and Species Regulations 2017 to maintain environmental protections that existed at the time the United Kingdom (UK) exited the EU and provide for the creation of the National Site Network.

3.2.1.4 The Conservation of Habitats and Species Regulations 2017 provide protection for certain species of plants and animals, referred to as European Protected Species. Schedule 2 and Schedule 5 of these Regulations set out those species that are protected, for animals and plants respectively. The activities that are prohibited, such as deliberate disturbance or causing damage to a breeding place, are set out in parts 43(1) and 47(1) for animals and plants respectively.

3.2.1.5 The Conservation of Habitats and Species Regulations 2017 also provide for licences to be granted for certain operations, such as projects that may affect protected species, subject to:

- there being no satisfactory alternative; and
- the action authorised not being detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

3.2.1.6 With respect to the Transmission Assets, the species present have been identified and the likely effects assessed within sections 3.6 and 3.11 of this chapter respectively. Where possible, effects on European Protected Species have been avoided or minimised.

3.2.1.7 The Conservation of Habitats and Species Regulations 2017 also require that Habitats Regulations Assessment (HRA) must be carried out for all plans and projects that are likely to have significant effects on European sites, which include Special Areas of Conservation (SACs), candidate SACs, Sites of Community Importance (SCIs), Special Protection Areas (SPAs) and, as a matter of policy, possible SACs (pSACs), potential SPAs (pSPAs) and Ramsar sites (listed under the Ramsar Convention). The Ramsar Convention is an intergovernmental treaty created in order to protect wetlands of international importance.

3.2.1.8 In this chapter, the term 'internationally designated sites' has been retained to refer to the above sites protected in European Member States, England and Wales. However, where these sites are located in the UK, they no longer form part of the EU's Natura 2000 ecological network and now form part of the National Site Network following amendment incorporated by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

3.2.1.9 The sites relevant to onshore ecology and nature conservation are SACs, candidate SACs, pSACs and SCIs.

3.2.1.10 An HRA Screening Report (document reference E3) and an ISAA (document references E2.1, 2.2, 2.3) have been prepared to accompany the ES to consider the effects of the Transmission Assets on the above sites.

The Wildlife and Countryside Act 1981

3.2.1.11 The Wildlife and Countryside Act 198 ('the Wildlife and Countryside Act 1981') is a key piece of national legislation which has been amended and supplemented by the provision of a number of other pieces of legislation including the Countryside and Rights of Way Act 2000, and the Natural Environment and Rural Communities Act 2006. Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) are designated and legally protected under Part II of the Wildlife and Countryside Act 1981.

3.2.1.12 The Wildlife and Countryside Act 1981 affords protection to animals under Schedule 5 which includes all bats, great crested newt (GCN) *Triturus cristatus*, water vole *Arvicola amphibius*, otter *Lutra lutra*, sand lizard *Lacerta agilis*, natterjack toad *Bufo calamita* and certain species of fish and invertebrates. Schedule 8 affords protection to specific species of plant and Schedule 9 details the list of Invasive Non-native Species (INNS) where it is an offence to plant or otherwise cause to grow in the wild. Additionally, all UK reptile species, comprising adder *Vipera berus*, grass snake *Natrix Helvetica*, common lizard *Zootoca vivipara*, slow worm *Anguis fragilis,* smooth snake *Coronella austriaca*, and sand lizard *Lacerta agilis*, are protected under sections 9(1) and 9(5) of the Wildlife and Countryside Act 1981.

The Natural Environment and Rural Communities Act 2006

3.2.1.13 Section 41 of the Natural Environment and Rural Communities Act 2006 requires the Secretary of State to publish a list of the species and habitats of principal importance for the conservation of biodiversity in England (first identified as priority habitats and species in the UK Biodiversity Action Plan (UK BAP)) and acts as a guide to local authorities in implementing their duties under Section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England.

Environment Act 2021

3.2.1.14 The Environment Act 2021 aims to halt the decline of nature by 2030 and amends the Wildlife and Countryside Act 1981 to introduce an additional purpose for granting a protected species licence in relation to development which is *'for reasons of overriding public interest'*. The Act also introduces the Office for Environmental Protection (OEP), a new public body intended to hold government and public authorities to account, although the government will be able to issue guidance to the Office for Environmental Protection on how it enforces policies and legislation. Some of the key elements in the Act that will have a bearing on biodiversity protection are as follows.

- A strengthened biodiversity duty on Local Planning Authorities.
- Biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity, which was made mandatory for new planning applications for major development made under the Town and Country Planning Act 1990 in February 2024. The stated intention is for requirements for projects subject to a Development Consent Order (DCO) to be implemented no later than 2025.
- Local Nature Recovery Strategies to support a Nature Recovery Network.
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature.
- The power for the Habitats Regulations to be amended.

3.2.1.15 Part 6 and Schedule 15 of the Environment Act 2021 sets out provisions for biodiversity gain in relation to Nationally Significant Infrastructure Projects and amends the Planning Act 2008. As stated in the Government response and summary of responses to the consultation on biodiversity gain (Department for Environment, Food & Rural Affairs (Defra), 2023), a requirement is proposed from November 2025 to allow developers time to prepare, with the level of requirement to be detailed within a biodiversity statement.

Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024

3.2.1.16 Irreplaceable habitats are defined within The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. Such habitats include coastal sand dunes, ancient woodland and ancient and veteran trees.

Protection of Badgers Act 1992

3.2.1.17 The Protection of Badgers Act 1992 prohibits reckless and/or intentional cruelty, injury or killing of badger *Meles meles* and the interference with badger setts.

The Eels (England and Wales) Regulations 2009

3.2.1.18 The Eels (England and Wales) Regulations came into force in January 2010 and allow the Environment Agency to implement measures for the recovery of eel stocks. Part 4 of the Regulations includes reference to construction and/or alteration of any obstruction to the passage of eels. Eel passes may be required where an obstruction to the passage of eels is created.

Salmon and Freshwater Fisheries Act 1975

3.2.1.19 The Salmon and Freshwater Fisheries Act 1975 came into force in August 1975, with the aim of protecting freshwater fisheries and migration routes. Part II relates to obstructions to passage of salmon or migratory trout and includes an obligation to make and maintain fish passes. The Act also makes it illegal to poison or injure fish, their spawn, spawning grounds and the food of such fish.

Hedgerows Regulations 1997

3.2.1.20 The Hedgerows Regulations 1997 are intended to protect 'important' countryside hedgerows from destruction or damage. A hedgerow, or the hedgerow of which it is a stretch, is defined as important pursuant to the Hedgerows Regulations 1997 if: (a) it has existed for 30 years or more; and (b) satisfies at least one of the criteria listed in Part II of Schedule 1 of the Hedgerows Regulations 1997.

3.2.1.21 Under the Hedgerows Regulations 1997, it is against the law to remove or destroy important hedgerows without permission from the local planning authority. Hedgerows on or adjacent to common land, village greens, SACs, SSSIs, National Nature Reserves (NNRs), Local Nature Reserves (LNR), land used for agriculture or forestry and land used for the keeping or breeding of horses, ponies or donkeys are covered by these regulations. Hedgerows *'within or marking the boundary of the curtilage of a dwelling-house'* are not protected.

3.2.2 The Convention on Biological Diversity

3.2.2.1 The Convention on Biological Diversity is an international legal instrument ratified by the UK in 1994 and which has the following three main objectives:

- the conservation of biological diversity;
- the sustainable use of the components of biological diversity; and
- the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

3.2.2.2 The overall objective is to encourage actions that will lead to a sustainable future. The Secretariat of the Convention is based in Montreal in Canada and aims to assist governments to implement the Convention and its programmes of work.

3.2.3 Planning policy context

3.2.3.1 The Transmission Assets will be located in English offshore waters (beyond 12 nautical miles (nm) from the English coast) and inshore waters, with the onshore infrastructure located wholly within England. As set out in Volume 1, Chapter 1: Introduction of the ES, the Secretary of State for the Department for Business, Energy and Industrial Strategy (the department which preceded the Department for Energy Security and Net Zero) has directed that the Transmission Assets are to be treated as development for which development consent is required under the Planning Act 2008.

3.2.3.2 The sections below set out the policy content in relation to ecology and nature conservation. Further details of the overarching policy context for the Transmission Assets are set out in Volume 1, Chapter 2: Policy and legislation context of the ES.

National Policy Statements

3.2.3.3 There are currently six energy National Policy Statements (NPSs), three of which contain policy relevant to offshore wind development and the Transmission Assets, specifically:

- Overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (Department for Energy Security & Net Zero 2023a);
- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security & Net Zero 2023b); and
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Department for Energy Security & Net Zero 2023c).

3.2.3.4 **Table 3.1** sets out a summary of the policies within the current NPSs, relevant to onshore ecology and nature conservation.

Table 3.1: Summary of the NPS EN-1, NPS EN-3 and NPS EN-5 requirements relevant to onshore ecology

Summary of NPS provision	How and where considered in the ES
NPS EN-1	
Although achieving biodiversity net gain is not currently an obligation on applicants, Schedule 15 of the Environment Act 2021 contains provisions which, when commenced, mean the Secretary of State may not grant an application for a Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the onshore development in England to which the application relates (NPS EN-1, paragraph 4.6.1).	An Onshore Biodiversity Benefit Statement (document reference J11) has been provided as part of the application for development consent. The biodiversity benefit approach taken for the Transmission Assets considers the above ground permanent onshore infrastructure and ensures that biodiversity benefit will be delivered for the areas of (permanent) habitat loss where possible. Furthermore, the Applicants will aim to improve habitat connectivity in accordance with NPS EN-5 where possible. The temporary land required will be restored to baseline habitat type and condition (CoT08, 14, 27). This approach affords biodiversity benefit whilst balancing other socio-economic and land use considerations.
The biodiversity gain objective will be set out in a biodiversity gain statement (as defined under the Environment Act 2021). Normally these statements would be included within an NPS, but the Act allows for the statement to be published separately where a review of an NPS has begun before the provisions are commenced, as is the case with these energy NPSs. Under the provision of the Environment Act 2021, any such separate biodiversity gain statement will be regarded as being contained within these NPSs (NPS EN-1, paragraph 4.6.2).	
The Secretary of State should give appropriate weight to environmental and biodiversity net gain, although any weight given to gains provided to meet a legal requirement (for example under the Environment Act 2021) is likely to be limited (NPS EN-1, paragraph 4.6.3).	Information to inform this decision is provided within this chapter and the Onshore Biodiversity Benefit Statement (document reference J11).
Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, and the wider environment where possible (NPS EN-1, paragraph 4.6.6).	As set out in the Onshore Biodiversity Benefit Statement (document reference J11), the Transmission Assets are not subject to a mandatory net gain requirement under the Environment Act 2021. Nevertheless, the Applicants have worked with statutory consultees to discuss the approach, and to develop the design, to allow the maximum benefit to biodiversity within the parameters of the project. For the Transmission Assets, biodiversity benefit will be delivered within identified biodiversity benefit areas within the Transmission Assets Order Limits: Onshore (referred to as the Onshore Order Limits) where possible. Further details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11). Wider ecological enhancement measures are set out within the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity.
In England applicants for onshore elements of any development are encouraged to use the latest version	The calculation undertaken for the Onshore Biodiversity Benefit Statement (document

Summary of NPS provision	How and where considered in the ES
of the biodiversity metric to calculate their biodiversity baseline and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application (NPS EN-1, paragraph 4.6.7).	reference J11) utilises the latest biodiversity metric published by Defra (version 4.1).
Where possible, this data should be shared, alongside a completed biodiversity metric calculation, with the Local Authority and Natural England for discussion at the pre-application stage as it can help to highlight biodiversity and wider environmental issues which may later cause delays if not addressed (NPS EN-1, paragraph 4.6.8).	The Onshore ecology and onshore and intertidal ornithology Expert Working Group (EWG), held in March 2023, first proposed that biodiversity benefit would be delivered for the Transmission Assets. Further details on the proposed approach to biodiversity benefit were set out in subsequent EWG meetings, held in September 2023 and December 2023. The September 2023 EWG set out guidance and calculation data/methodology being used. Discussion included the availability of some baseline data sets, the approach to including trenchless techniques in the biodiversity assessment and treatment of areas of mitigation in the metric. The December 2023 EWG restated the key policy, guidance principles and calculation methodology. It also included discussion around areas of land potentially suitable for delivering biodiversity benefit and consultation with local schemes around the delivery of biodiversity benefit through a collaborative approach. It included results of a preliminary assessment and calculation of the preliminary areas of interest and the limited permanent habitat loss proposed for the Transmission Assets, especially when considering the proposed trenchless techniques to avoid impacts on habitats of significant ecological value. Following the EWG meeting in December 2023, a technical note setting out .the proposed approach to biodiversity benefit was issued to the EWG. This note included the following. • Key considerations for the delivery of biodiversity benefit for the Transmission Assets, in particular around the voluntary basis for biodiversity benefit delivery, the amount of land required to deliver biodiversity benefit across the Transmission Assets and the overall feasibility using the Defra metrics for the whole of the Onshore Order Limits. • The Applicants' proposed approach to biodiversity benefit, which is to achieve at least 10% biodiversity benefit for the area of land associated with permanent above-ground infrastructure. Feedback was received following this technical note from the Environment Agency, confirming their agreement with the proposed approach, subject to commitments that:

Summary of NPS provision	How and where considered in the ES
	• there would be no impact (temporary or permanent) on the areas subject to Horizontal Directional Drilling (HDD); and • the land along the cable corridor and associated temporary works areas are returned to their baseline condition. Further details regarding EWG meetings and the calculation data are set out in **section 3.3.2**. Further details regarding the approach to biodiversity benefit are set out in the Onshore Biodiversity Benefit Statement (document reference J11).
Biodiversity net gain should be applied after compliance with the mitigation hierarchy and does not change or replace existing environmental obligations, although compliance with those obligations will be relevant to the question of the baseline for assessing net gain and if they deliver an additional enhancement beyond meeting the existing obligation, that enhancement will count towards net gain (NPS EN-1, paragraph 4.6.10).	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests and complies with the mitigation hierarchy, with measures to avoid and minimise impacts as far as is possible. Offsetting will only be required for the permanent habitat loss areas, where biodiversity benefit is being delivered. Furthermore, the Applicants will consider the potential opportunities to collaborate with existing projects and stakeholders, as set out in the within the Outline Ecological Management Plan (document reference J6).
Biodiversity net gain can be delivered onsite or wholly or partially off-site. We encourage details of any off-site delivery of biodiversity net gain to be set out within the application for development consent (NPS EN-1, paragraph 4.6.11).	Biodiversity benefit associated with the permanent above ground infrastructure will be provided within the Onshore Order Limits where possible, which will be set out within the Onshore Biodiversity Benefit Statement (document reference J11). The potential for collaboration with external organisations and further ecological enhancement is set out within the Outline Ecological Management Plan (document reference J6), including the opportunities for collaboration discussed with key stakeholders, and relevant Local Nature Recovery Strategies for which information is provided in **section 3.6.1** Lancashire's ecological network, which seeks to identify and provide a basis for protecting ecological connectivity in the county is discussed in **section 3.6.1** and **section 3.11.6.** The Onshore Biodiversity Benefit Statement (document reference J11) assesses the extent to which the habitat creation associated with the project contributes to current and future connection within and beyond the Onshore Order Limits. This includes habitat restoration and creation within and adjacent to Lea Marsh Biological Heritage Site (BHS) that will increase the extent, quality and connectedness of grassland and wetland habitat, potentially leading to improvement in ecosystem function and local improvements in ecosystem
When delivering biodiversity net gain off-site, developments should do this in a manner that best contributes to the achievement of relevant wider strategic outcomes, for example by increasing habitat connectivity, enhancing other ecosystem service outcomes, or considering use of green infrastructure strategies. Reference should be made to relevant national or local plans and strategies, to inform off-site biodiversity net gain delivery. If published, the relevant strategy is the Local Nature Recovery Strategy (LNR). If an LNR has not been published, the relevant consenting body or planning authority may specify alternative plans, policies or strategies to use (NPS EN-1, paragraph 4.6.12).	

Summary of NPS provision	How and where considered in the ES
	services such as surface water quality and flows, with benefits to Ribble Estuary and its tributaries. Where relevant, green infrastructure strategies have been considered within Volume 3, Chapter 6: Land use and recreation of the ES and Volume 4, Chapter 2: Socio-economics of the ES.
In addition to delivering biodiversity net gain, developments may also deliver wider environmental gains and benefits to communities relevant to the local area, and to national policy priorities, such as: • reductions in GHG emissions • reduced flood risk • improvements to air or water quality, • climate adaptation, • landscape enhancement • increased access to natural greenspace, or • the enhancement, expansion or provision of trees and woodlands The scope of potential gains will be dependent on the type, scale, and location of specific projects. Applicants should look for a holistic approach to delivering wider environmental gains and benefits through the use of nature-based solutions and Green Infrastructure (NPS EN-1, paragraph 4.6.13).	Where practicable, the Applicants have looked to provide a coordinated approach to the design and development of mitigation and enhancement measures. This has included, for example, a coordinated approach to the design at the onshore substation sites to incorporate ecological, drainage and landscape considerations, that will result in wider environmental gains. Flood risk is considered in Volume 3, Chapter 2: Hydrology and flood risk of the ES, and water quality is considered in Volume 3, Annex 2.1: Water Framework Directive Surface and Groundwater Assessment of the ES. Greenhouse gas emissions and climate adaptation are assessed in Volume 4, Chapter 1: Climate change of the ES. Landscape and visual effects are assessed in Volume 3, Chapter 10: Landscape and visual resources of the ES, and heritage impacts in Volume 3, Chapter 5: Historic environment of the ES.
The Environment Act 2021 mandated the preparation of Local Nature Recovery Strategies (LNRs) across England. They are a new system of spatial strategies for nature recovery and will play a major role in providing detail on the best locations to create, enhance and restore nature and deliver wider environmental benefits. LNRs will also agree priorities for nature recovery and map the most valuable existing areas for nature. They will be critical in delivering new government targets for species abundance and habitat creation commitments, as well as other pressing environmental outcomes for water and flood risk, carbon and tree planting and woodland creations. LNRs will also drive the creation of a Nature Recovery Network, a major commitment in the government's 25 Year Environment Plan (NPS EN-1, paragraph 4.6.14).	The status of the Local Nature Recovery Strategy for Lancashire is summarised in **section 3.6.1.** Step 1 of the strategy, to map areas of particular importance for biodiversity, has been completed by Lancashire County Council. Accordingly, **section 3.11** of this chapter includes assessment of areas of particular importance such as statutory and non-statutory designated sites. **Section 3.11.6** considers impacts on habitat connectivity within the Local Nature Recovery Strategy area, in which areas of particular importance are included as core areas and fragmentation of connectivity between them is assessed on the basis of the available information on woodland and grassland ecological networks for Lancashire. As stated in the EWG held on December 2023, the Applicants have considered ecological networks in the site selection process. The Applicants are also exploring collaboration with other schemes in order to deliver wider ecological enhancement, including through improving habitat connectivity, as stated in the EWG held in June 2024. Consequently, areas selected for mitigation and biodiversity benefit have sought to enhance and expand areas of particular importance where possible to do so, such as within Lytham Moss BHS and within and adjacent to Lea Marsh BHS. In addition, the landscaping associated with the onshore substation sites will

Summary of NPS provision	How and where considered in the ES
	contribute to reinstating the permanent loss of habitat connectivity in these areas.
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 (NPS EN-1, paragraph 5.4.17).	Effects on designated sites associated with onshore ecology and protected or otherwise notable species are set out in **section 3.11** of this chapter.
The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests (NPS EN-1, paragraph 5.4.19).	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. It also includes opportunities for biodiversity benefit. Further details of the approach to conserving and enhancing biodiversity are provided in the Onshore Biodiversity Benefit Statement (document reference J11). Geological conservation interests are considered in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.
Applicants should consider wider ecosystem services and benefits of natural capital when designing enhancement measures (NPS EN-1, paragraph 5.4.20).	Where practicable, the Applicants have looked to provide a coordinated approach to the design and development of mitigation and enhancement measures. This has included, for example, a coordinated approach to the design at the onshore substation sites to incorporate ecological, drainage and landscape considerations, that will result in wider environmental gains. More details regarding the project design evolution can be found in Volume 1, Chapter 4: Site selection and consideration of alternatives of the ES. Further details regarding the approach to mitigation and enhancement measures can be found in Volume 1, Chapter 5: Environmental assessment methodology of the ES.
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 (NPS EN-1, paragraph 5.4.21).	
The design of energy NSIP proposals will need to consider the movement of mobile/migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure. As energy infrastructure could occur anywhere within England and Wales, both inland and onshore and offshore, the potential to affect mobile and migratory species across the UK and more widely across Europe (transboundary effects) requires consideration, depending on the location of development (NPS EN-1, paragraph 5.4.22).	Those migratory species that have potential to interact with the infrastructure associated with the Transmission Assets have been presented in Volume 2, Chapter 3: Fish and shellfish and Volume 2, Chapter 4: Marine mammals of the ES. The impacts on migratory fish associated with the River Ribble are assessed in **section 3.11.15.** The potential for transboundary impacts on these species is considered within **section 3.15** of this chapter. Transboundary impacts on other species are considered in Volume 1, Annex 5.4: Transboundary screening of the ES. Impacts on migratory birds are considered in Volume 2, Chapter 5: Offshore Ornithology and

Summary of NPS provision	How and where considered in the ES
	Volume 3, Chapter 4: Onshore and Intertidal Ornithology of the ES.
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 phases (NPS EN-1, paragraph 5.4.32)	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. Impacts on ancient woodland and ancient and veteran trees are set out in **section 3.11** of this chapter which demonstrates that there will be no adverse effects on them. As stated in Volume 1, Chapter 3: Project Description of the ES, the installation of the onshore export cable corridor at Lytham St Annes Dunes SSSI and the St Annes Old Links Golf Course will be undertaken by trenchless techniques (direct pipe) to avoid the need for any trenching at these locations.
Applicants should 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 as set out under Section 4.6 (NPS EN-1, paragraph 5.4.33). Consideration should be given to improvements to, and impacts on, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, beyond those under protection and identified as being of principal importance. This may include considerations and opportunities identified through Local Nature Recovery Strategies, and national goals and targets set through the Environment Act 2021 and the Environmental Improvement Plan 2023 (NPS EN-1, paragraph 5.4.34).	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. It also includes opportunities for biodiversity benefit. Habitat creation and enhancement necessary to compensate for the adverse effects of the project are described in **section 3.11**. Biodiversity benefit will be delivered within identified biodiversity benefit areas within the Onshore Order Limits. Further details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11). Wider ecological enhancement measures are set out within the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity.
Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: • during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works • the timing of construction has been planned to avoid or limit disturbance • during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements • habitats will, where practicable, be restored after construction works have finished	The Applicants have implemented the mitigation hierarchy. Volume 1, Chapter 4: Site selection and consideration of alternatives sets out the measures taken to avoid ecological features, where practicable. Mitigation measures proposed as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of disturbance or damage to species or habitats is minimised, and for restoration of habitats that are unavoidably affected.

Summary of NPS provision	How and where considered in the ES
• 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. (NPS EN-1, paragraph 5.4.35).	In terms of enhancement, details are provided in the Onshore Biodiversity Benefit Statement (document reference J11) and the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity
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 (NPS EN-1, paragraph 5.4.36).	An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. An Outline Biosecurity Protocol (document reference J1.12) is appended to the Outline Code of Construction Practice (document reference J1), which has been submitted as part of the application for development consent.
The government's 25 Year Environment Plan and the Environment Act 2021 mark a step change in ambition for wildlife and the natural environment. The Secretary of State should have regard to the aims and goals of the government's Environmental Improvement Plan 2023, and in Wales the objectives of the Nature Recovery Plan, and any relevant measures and targets, including statutory targets set under the Environment Act or elsewhere (NPS EN-1, paragraph 5.4.39).	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. It also includes opportunities for biodiversity benefit. The Applicants have had regard to the goals of the Environmental Improvement Plan and the need to conserve and enhance habitats in developing appropriate mitigation for the Transmission Assets.
The benefits of nationally significant low carbon energy infrastructure development may include benefits for biodiversity and geological conservation interests and these benefits may outweigh harm to these interests. The Secretary of State may take account of any such net benefit in cases where it can be demonstrated (NPS EN-1, paragraph 5.4.41).	Noted. Any beneficial impacts are set out within **section 3.11** of this chapter.
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 (NPS EN-1, paragraph 5.4.42).	The Applicants have implemented the mitigation hierarchy. Volume 1, Chapter 4: Site selection and consideration of alternatives sets out the measures taken to avoid ecological features, where practicable. Mitigation measures proposed as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of disturbance or damage to species or habitats is
If significant harm to biodiversity resulting from a development cannot be avoided (for example through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then the Secretary of State will give	

Summary of NPS provision	How and where considered in the ES
significant weight to any residual harm (NPS EN-1, paragraph 5.4.43).	minimised, and for restoration of habitats that are unavoidably affected. In terms of compensation and enhancement, details are provided in the Onshore Biodiversity Benefit Statement (document reference J11) and the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity. Impacts on geological conservation interests are considered in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.
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 generally be maintained for a minimum period of 30 years, or for the lifetime of the project, if longer (NPS EN-1, paragraph 5.4.44).	Details of the Commitments proposed in relation to species and habitats are set out in **section 3.8** of this chapter. Residual effects are identified in **Section 3.11** of this chapter. A Commitments Register is provided at Volume 1, Annex 5.3: Commitments register of the ES, which details all Commitments made and the method for securing these. A draft DCO is provided as part of the application for development consent. This includes draft requirements.
The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and the SNCB and the MMO/NRW (where appropriate). The Secretary of State will also need to consider whether the SNCB or the MMO/NRW has granted or refused, or intends to grant or refuse, any relevant licences, including protected species mitigation licences (NPS EN-1, paragraph 5.4.45).	Details of the mitigation measures proposed are set out in **section 3.8** of this chapter. These have been developed taking into account discussions held with Statutory Nature Conservation Bodies (SNCBs) during EWG meetings (see **Table 3.5**).
Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. The Secretary of State should give appropriate weight to environmental and biodiversity enhancements, although any weight given to gains provided to meet a legal requirement (for example under the Environment Act 2021) is likely to be limited (NPS EN-1, paragraph 5.4.46).	The Applicants have implemented the mitigation hierarchy. Volume 1, Chapter 4: Site selection and consideration of alternatives sets out the measures taken to avoid ecological features, where practicable. Mitigation measures proposed as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of disturbance or damage to species or habitats is minimised, and for restoration of habitats that are unavoidably affected. In terms of compensation and enhancement, details are provided in the Onshore Biodiversity Benefit Statement (document reference J11) and the Outline Ecological Management Plan (document reference J6). The Applicants are
When considering proposals, the Secretary of State should maximise such reasonable opportunities in and around developments, using requirements or planning obligations where appropriate. This can help towards delivering biodiversity net gain as part of or in addition to the approach set out at Section 4.6 (NPS EN-1, paragraph 5.4.47).	

Summary of NPS provision	How and where considered in the ES
	committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity. Impacts on geological conservation interests are considered in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Where practicable, the Applicants have looked to provide a coordinated approach to the design and development of mitigation and enhancement measures. This has included, for example, a coordinated approach to the design at the onshore substation sites to incorporate ecological, drainage and landscape considerations, that will result in wider environmental gains.
In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national, and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment (NPS EN-1, paragraph 5.4.48).	The baseline ecological environment is described in **section 3.6.** As part of this chapter, the process of identifying designated sites has been undertaken and results are presented in **section 3.6.1** of this chapter. The level of importance of ecological features is discussed in **Section 3.6** and summarised in **Table 3.17.** The significance of an effect is determined by the importance and sensitivity of a site or other ecological feature, as well the magnitude of the impact as summarised in **Table 3.24**.
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 (NPS EN-1, paragraph 5.4.49).	Impacts on internationally designated sites forming part of the National Site Network are considered in **section 3.11** of this chapter and in the ISAA (document references E2.1, 2.2, 2.3) that accompanies the application.
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 (NPS EN-1, paragraph 5.4.50).	A draft DCO is provided as part of the application for development consent (document reference C1). This includes draft requirements, based on the Commitments proposed as part of the Transmission Assets application.
The Secretary of State should give due consideration to regional or local designations. However, given the need for new nationally significant infrastructure, these designations should not be used in themselves to refuse development consent (NPS EN-1, paragraph 5.4.52).	Impacts on regionally or locally designated sites are considered in **section 3.11** of this chapter.
The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of any irreplaceable habitats, including ancient woodland, and ancient and veteran trees unless there are wholly exceptional reasons and a suitable compensation strategy exists ((NPS EN-1, paragraph 5.4.53).	Commitments made as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. Impacts on ancient woodland and ancient and veteran trees are set out in **section 3.11** of this chapter, which demonstrates that there will be no adverse effects on them. Irreplaceable habitat present within the study and survey areas is set out in **section 3.6** of this chapter.

Summary of NPS provision	How and where considered in the ES
The Secretary of State should ensure that species and habitats identified as being of importance for the conservation of biodiversity are protected from the adverse effects of development by using requirements, planning obligations, or licence conditions where appropriate (NPS EN-1, paragraph 5.4.54).	A draft DCO is provided as part of the application for development consent. This includes draft requirements, based on the Commitments proposed as part of the Transmission Assets application. Details of the Commitments proposed in relation to species and habitats are set out in **section 3.8** of this chapter. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of disturbance or damage to species or habitats is minimised, and for restoration of habitats that are unavoidably affected.
The Secretary of State should refuse consent where harm to a protected species and relevant habitat would result, unless there is an overriding public interest and the other relevant legal tests are met. In this context the Secretary of State should give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance or the climate resilience and the capacity of habitats to store carbon, which they consider may result from a proposed development (NPS EN-1, paragraph 5.4.55).	Impacts on protected species and relevant habitats are considered in **section 3.11** of this chapter. Details of impacts on internationally designated sites and the findings of the HRA process, including details of the relevant legal tests are provided in the ISAA that accompanies the application (document references E2.1, 2.2, 2.3).
The ES (see Section 4.3) should include an assessment of the effects on the coast, tidal rivers and estuaries. In particular, applicants should assess: … • the effects of the proposed project on marine ecology, biodiversity, protected sites and heritage assets …. (NPS EN-1, paragraph 5.6.11).	Impacts on marine ecology are considered in Volume 2, Chapter 2: Benthic and subtidal ecology, Volume 2, Chapter 3: Fish and shellfish, Volume 2, Chapter 4: Marine mammals and Volume 2, Chapter 5: Offshore ornithology of the ES. Impacts on onshore biodiversity, including protected sites, are set out in **section 3.11** of this chapter.
NPS EN-3	
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 (NPS EN-3, paragraph 2.5.2).	Where practicable, the Applicants have looked to provide a coordinated approach to the design and development of mitigation and enhancement measures. This has included, for example, a coordinated approach to the design at the onshore substation sites to incorporate ecological, drainage and landscape considerations, that will result in wider environmental gains. Landscape and visual effects are assessed in Volume 3, Chapter 10: Landscape and visual resources of the ES, and heritage impacts in Volume 3, Chapter 5: Historic environment of the ES. Details of the site selection process and alternative design options considered are provided in Volume 1, Chapter 4: Site selection and consideration of alternatives pf the ES.
Generic biodiversity and ecology effects and receptors are covered in detail in Section 5.4 of EN-1.	Impacts on marine ecology are considered in Volume 2, Chapter 2: Benthic and subtidal ecology of the ES, Volume 2, Chapter 3: Fish and shellfish

Summary of NPS provision	How and where considered in the ES
The coastal change policy in Section 5.6 of EN-1 may also be relevant. Impacts on the physical environment may have indirect effects on marine biodiversity. In addition, applicants should have regard to the specific ecological and biodiversity considerations that relate to proposed offshore renewable energy infrastructure developments, namely: • fish (see Section 2.8.250 of this NPS). • intertidal and subtidal seabed habitats and species (see Section 2.8.233 of this NPS). • marine mammals (see Section 2.8.237 of this NPS). • birds (see Section 2.8.240 of this NPS); and • wider ecosystem impacts and interactions, and other relevant protected migratory species. (NPS EN-3, paragraph 2.8.95-98).	of the ES, Volume 2, Chapter 4: Marine mammals and Volume 2, Chapter 5: Offshore ornithology of the ES. Impacts on onshore biodiversity, including impacts on ecosystems, are set out in **section 3.11** of this chapter.
NPS EN-5	
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: i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements. (NPS EN-5, paragraph 2.5.1).	The impacts on and mitigation for impacts on habitat connectivity are discussed in **section 3.11** of this chapter. The Onshore Biodiversity Benefit Statement (document reference J11) has been provided as part of the application for development consent and provides information on the habitat connectivity provided by the project.

The National Planning Policy Framework

3.2.3.5 The National Planning Policy Framework (NPPF) was published in 2012 and updated in 2018, 2019, 2021, 2023 and 2024 (Ministry of Housing, Communities and Local Government, 2024). The NPPF sets out the Government's planning policies for England.

3.2.3.6 The Government has published proposed reforms to the NPPF for consultation on 30 July 2024, with the consultation period ending on 24 September 2024 (Ministry of Housing, Communities and Local Government, 2024). Following consultation, the NPPF will be updated.

3.2.3.7 **Table 3.2** sets out a summary of the NPPF policies relevant to this chapter.

Table 3.2: Summary of NPPF requirements relevant to onshore ecology

Policy	Key provisions	How and where considered in the ES
Conserving and enhancing the natural environment. (NPPF Section 15)	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; … 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; …. (Paragraph 180 (d)).	The Applicants have implemented the mitigation hierarchy. Volume 1, Chapter 4: Site selection and consideration of alternatives sets out the measures taken to avoid ecological features, where practicable. Mitigation measures proposed as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of disturbance or damage to species or habitats is minimised, and for restoration of habitats that are unavoidably affected. In terms of compensation and enhancement, details are provided in the Onshore Biodiversity Benefit Statement (document reference J11) and the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity. Impacts on habitats and species are set out in **section 3.11** of this chapter.
Habitats and biodiversity. (NPPF Section 15)	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 b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue	The baseline onshore ecology environment is described in **section 3.6**. All relevant designated sites are described in Volume 3, Annexes 3.1 to 3.15 of the ES. Mitigation measures (Commitments) are discussed in **section 3.8**.

Policy	Key provisions	How and where considered in the ES
	opportunities for securing measurable net gains for biodiversity. (Paragraph 185)	
	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 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. (Paragraph 186)	Volume 1, Chapter 4: Site selection and consideration of alternatives demonstrates how onshore ecology and nature conservation constraints were considered in establishing the Onshore Order Limits, alongside evaluation of a range of a range of other environmental considerations. As described in **section 3.8**, trenchless techniques have been used to avoid or reduce direct and indirect effects on onshore ecology and nature conservation where justified and practicable. Additionally, there is a commitment (CoT31) to further reduce loss of ponds through micro-siting of the onshore export cable corridor and 400 kV grid connection corridor where reasonably practicable. As stated in Volume 1, Chapter 3: Project Description of the ES, the installation of the onshore export cable corridor at Lytham St Annes Dunes SSSI and the St Annes Old Links Golf Course will be undertaken by direct pipe. Impacts on ancient woodland and ancient and veteran trees are set out in **section 3.11** of this chapter, which demonstrates that there will be no effects on them.
	The following should be given the same protection as habitats sites: a) potential Special Protection Areas and possible Special Areas of Conservation; b) listed or proposed Ramsar sites; and c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites. (Paragraph 187)	The level of importance of ecological features is discussed in **Section 3.6** and summarised in **Table 3.17.** There are no proposed Ramsar sites or pSACs of relevance to the project. Any potential impacts on the Solway Firth pSPA are considered in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES and the ISAA (document references E2.1, 2.2, 2.3) prepared to accompany the application for development consent. Impacts on compensatory habitat provided to address the effects of other developments are also considered in Volume 3, Chapter 4:

Policy	Key provisions	How and where considered in the ES
		Onshore and intertidal ornithology of the ES.
	The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site. (Paragraph 188)	An ISAA (document references E2.1, E2.2, E2.3) has been prepared to accompany the application for development consent.

3.2.3.8 The consultation draft includes similar provisions as the designated NPPF. The consultation draft NPPF has been reviewed and there are no material updates for onshore ecology and nature conservation.

3.2.3.9 The Planning Practice Guidance (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2024) supports the NPPF and provides guidance across a range of topic areas, including a section on natural environment and biodiversity needs to be assessed within a planning an application (paragraphs 18-35).

Biodiversity 2020

3.2.3.10 Biodiversity 2020 (Defra, 2011) sets out a strategy for England's wildlife and ecosystem services. **Table 3.3** summarises the key national policy set out in this document.

Table 3.3: Summary of Biodiversity 2020 requirements

Document/ policy	Key provisions	How and where considered in the ES
Biodiversity 2020 mission	• The key mission for the strategy is to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish ecological networks, with more and better places for nature for the benefit of wildlife and people. Page 12.	Proposed mitigation measures (Commitments) are discussed in **section 3.8**. Details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11).
Outcome 1 – Habitats and ecosystems on land	• Better wildlife habitats with 90% of priority habitats in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintaining at least 95% in favourable or recovering condition, Page 12 bullet point 1A. • More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha, Page 12 bullet point 1B. • Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaptation, Page 12 bullet point 1C.	

3.2.4 Local planning policy

3.2.4.1 The onshore elements of the Transmission Assets are located within the administrative areas of Fylde Council, Blackpool Council, South Ribble Borough Council and Preston City Council (and Lancashire County Council at the County level).

3.2.4.2 The relevant local planning policies applicable to onshore ecology and nature conservation based on the extent of the study areas for this assessment are summarised in **Table 3.4.**

Table 3.4: Summary of local planning policy relevant to onshore ecology and nature conservation

Policy	Key provisions	How and where considered in the ES
Fylde Local Plan to 2032 (incorporating Partial Review) (Adopted December 2021)		
Strategic Policy ENV2 Section 1 – Nature conservation sites and ecological networks	Section 1. Nature Conservation Sites and Ecological networks **a) Hierarchy of nature conservation sites** The Council is committed to ensuring the protection and enhancement of Fylde's biodiversity and geological assets and interests. In order to do this, the Council will have regard to the following hierarchy of nature conservation sites when making planning decisions, according to their designation: i. International Ramsar Sites, SAC, SPA, Candidate SAC/SPA The strongest possible protection will be given to sites of international importance, predominantly the Ribble and Alt Estuaries SPA/Ramsar site. ii. NNR, SSSI, MCZ iii. Local Geodiversity Sites, County Biological Heritage Sites, Local Nature Conservation Sites, Local Nature Reserve Development that would directly or indirectly affect any sites of local importance will be permitted only where it is necessary to meet an overriding local public need or where it is in relation to the purposes of the nature conservation site. **b) Development within or affecting nature conservation sites and ecological networks** In addition to the provisions of National and European law, and in accordance with national planning policy, proposals for development within or affecting the above nature conservation sites must adhere to all of the following principles: i. Development that would directly or indirectly affect any sites of local importance including ancient woodland or ancient and veteran trees will be permitted only where it is necessary to meet an overriding local public need or where it is in relation to the purposes of the nature	All relevant designated sites are discussed in Volume 3, Annex 3.1: Onshore ecology desk study technical report and Volume 3, Annex 3.3: Phase 1 habitat survey, national vegetation classification and hedgerow survey technical report of the ES. Assessment of the impacts and effects of the Transmission Assets are discussed in **section 3.11**. Impacts on geological conservation interests are considered in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Impacts in relation to ancient woodland and veteran trees are set out in sections 3.11.8 and 3.11.9. Mitigation measures proposed as part of the Transmission Assets are set out in **section 3.8**. This includes measures to conserve biodiversity in terms of ecological interests. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent. This contains information on the measures that will be implemented ensure that risk of

Policy	Key provisions	How and where considered in the ES
	conservation, or mitigation can avoid affecting site integrity. ii. Proposals which primarily seek to enhance or conserve biodiversity will be supported in principle, subject to the consideration of other Local Plan policies; iii. Consideration should be given to the impact of development proposals on the County-wide Lancashire Ecological network and, where possible, opportunities to support the network by incorporating biodiversity in and around the development should be encouraged; iv. Where development is considered necessary, adequate mitigation measures and compensatory habitat creation will be required through planning conditions and/or obligations, in order to secure measurable net gains for biodiversity. Measures should be put in place for the ongoing management of such features. Where it has been demonstrated that significant harm cannot be avoided appropriate mitigation or, as a last resort, replacement or other compensation will be required. The location of appropriate mitigation, replacement or other compensation will be targeted, using a sequential approach: • Within the development site; • In the immediate locality; • Within a Nature Improvement Area within the Borough; • Within a Nature Improvement Area elsewhere in the Fylde Coast; and lastly, • Elsewhere. Where significant harm resulting from development cannot be avoided, adequately mitigated or, as a last resort, replaced or compensated, then planning permission will be refused. **c) Damage to nature conservation sites and ecological networks** The following definition of what constitutes damage to nature conservation sites and other ecological assets will be used in assessing developments likely to impact upon them: i. loss of the undeveloped open character of a part, parts or the entire nature conservation site or ecological network; ii. reducing the width of part of an ecological network or causing direct or indirect severance of any part of the ecological network or of any part of a nature conservation site including the flight path of migratory birds;	disturbance or damage to species or habitats is minimised, and for restoration of habitats that are unavoidably affected. In terms of compensation and enhancement, details are provided in the Onshore Biodiversity Benefit Statement (document reference J11) and the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity.

Policy	Key provisions	How and where considered in the ES
	iii. restricting the potential for movement of wildlife within or through an ecological network or nature conservation site; iv. causing the degradation of the ecological functions of any part of the ecological network or nature conservation site; v. directly or indirectly damaging or severing links between nature conservation sites, green spaces, wildlife corridors and the countryside; and vi. impeding links to the wider ecological network and nature conservation sites that are recognised by neighbouring planning authorities. Section 1 (Nature Conservation Sites and Ecological networks) of this policy applies to all presently designated nature conservation sites, which are identified on the Policies Map including Inset Plans and to any nature conservation sites or ecological networks that may be designated in the future by appropriate agencies. The Fylde Ecological Network, comprising the Grassland Network, the Wetland and Heath Network and the Woodland Network has been identified and mapped by LCC and Lancashire Wildlife Trust, in compliance with the Framework and is accessible on the Planning Policy website.	
Strategic Policy ENV2 Section 2 – Priority species protection	**Section 2 Priority Species Protection** Planning permission will not be granted for development which would have an adverse effect on a priority species or its habitat, unless the benefits of the development outweigh the need to maintain the population of the species in situ. Should development be permitted that might have an adverse effect on a priority species or its habitat, planning conditions or agreements will be used to: • Ensure the survival of the individual species affected; and where this cannot be achieved: • Reduce the disturbance to a minimum; • Provide adequate alternative habitats to enhance the viability of the local population of that species; and • Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.	Assessment of the impacts and effects of the Transmission Assets on species are discussed in **section 3.11**. Mitigation measures (Commitments) are discussed in **section 3.8**.
South Ribble Local Plan 2012-2026 (Adopted July 2015)		
G7 – Green Infrastructure Existing Provision	Green Infrastructure is defined in the introduction to this chapter. Development proposals should seek to protect and enhance the existing Green Infrastructure. Development which would involve the loss of Green Infrastructure (as identified on the Policies Map) will not be permitted unless:	The green infrastructure assets identified on the Local Plan Policies Map in the vicinity of the Transmission Assets are largely associated with the River Ribble and will not be affected as the installation

Policy	Key provisions	How and where considered in the ES
	a) Alternative provision of similar and/or better facilities for the community will be implemented on another site or within the locality; or b) It can be demonstrated that the retention of the site is not required to satisfy a recreational need in the local area; and c) The development would not detrimentally affect the amenity value and the nature conservation value of the site.	method will be trenchless to install the cables beneath this area. The 400 kV grid connection cable corridor will cross green infrastructure at Howick Hall Wood at Howick Cross Lane to the east of Higher Penwortham. There would be no permanent loss of habitat at this location and no long-term adverse effects on green infrastructure in the district. Commitments are set out in **section 3.8**, which include measures to improve green infrastructure in the areas around the onshore substations.
G8 – Green Infrastructure – Future Provisions	All developments should provide: a) Appropriate landscape enhancements; b) Conservation of important environmental assets, natural resources, biodiversity and geodiversity; c) For the long-term use and management of these areas; and d) Access to well-designed cycleways, bridleways and footways (both off and on road), to help link local services and facilities.	Refer to Volume 3, Chapter 10: Landscape and visual resources of the ES for information on landscape enhancements. Details of measures proposed to conserve biodiversity are set out in **section 3.11**. Information on geodiversity is provided in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Information on access and recreation is provided in Volume 3, Chapter 6: Land use and recreation of the ES. Information on long term management of ecological mitigation and compensation is provided in the Outline Ecological Management Plan (document reference J6).
G13 – Trees, Woodland and Development	a) Planning permission will not be permitted where the proposal adversely affects trees, woodlands and hedgerows which are: i. Protected by a Tree Preservation Order (TPO); ii. Ancient Woodlands including individual ancient and veteran trees and those defined in Natural England's inventory of ancient woodlands; iii. In a Conservation Area; or iv. Within a recognised Nature Conservation Site.	Information on tree retention and replacement is provided in Volume 3, Annex 10.5: Tree survey and arboricultural impact assessment of the ES. There would be no impacts on ancient woodland or ancient and veteran trees as described in **section 3.11.** Impacts on recognised nature conservation sites are also assessed in **section 3.11**.

Policy	Key provisions	How and where considered in the ES
	b) There will be a presumption in favour of the retention and enhancement of existing tree, woodland and hedgerow cover on site; c) Where there is an unavoidable loss of trees on site, replacement trees will be required to be planted on site where appropriate at a rate of two new trees for each tree lost; d) Tree survey information should be submitted with all planning applications, where trees are present on site. The tree survey information should include protection, mitigation and management measures; e) Appropriate management measures will be required to be implemented to protect newly planted and existing trees, woodlands and/or hedgerows.	
Policy G16 – Biodiversity and nature conservation	The borough's Biodiversity and Ecological Network resources will be protected, conserved and enhanced. The level of protection will be commensurate with the site's status and proposals will be assessed having regard to the site's importance and the contribution it makes to wider ecological networks: Regard will be had to: • Protecting and safeguarding all designated sites of international, national, regional, county and local level importance including all Ramsar, Special Protection Areas, Special Areas of Conservation, national nature reserves, Sites of Special Scientific Interest and Biological Heritage Sites, Geological Heritage Sites, Local Nature Reserves, wildlife corridors together with any ecological network approved by the Council; • Protecting, safeguarding and enhancing habitats for European, nationally and locally important species; when considering applications for planning permission, protecting, conserving and enhancing the borough's ecological network and providing links to the network from and/or through a proposed development site. In addition development should have regard to the provisions set out below: a) The need to minimise impacts on biodiversity and providing net gains in biodiversity where possible by designing in wildlife and by ensuring that significant harm is avoided or, if unavoidable, is reduced or appropriately mitigated and/or, as a last resort, compensated; b) The need to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations; c) Where there is reason to suspect that there may be protected habitats/species on or close to a proposed development site, planning applications	All relevant designated sites and areas for wildlife conservation and species afforded extra protections under The Conservation of Habitats and Species Regulations 2017 and Schedule 5 of the Wildlife and Countryside Act 1981 are discussed in Volume 3, Annexes 3.1 to 3.15 of the ES. This information is summarised in **section 3.6** of this chapter. Assessment of the impacts and effects of the Transmission Assets relevant for onshore ecology are discussed in **section 3.11**. Mitigation measures (commitments) are discussed in **section 3.8**.

Policy	Key provisions	How and where considered in the ES
	must be accompanied by a survey undertaken by an appropriate qualified professional; d) Where the benefits for development in social or economic terms are considered to outweigh the impact on the natural environment, appropriate and proportionate mitigation measures and/or compensatory habitat creation of an equal or greater area will be required through planning conditions and/or planning obligations.	
Blackpool Local Plan Part 2: Site Allocations and Development Management Policies (Adopted 2023)		
CS6 – Green Infrastructure	High-quality and well connected networks of green infrastructure in Blackpool will be achieved by: Protecting existing green infrastructure networks and existing areas of Green Belt. The loss of green infrastructure will only be acceptable in exceptional circumstances where it is allowed for as part of an adopted Development Plan Document; or where provision is made for appropriate compensatory measures, mitigation or replacement; or in line with national planning policy. In terms of Green Belt areas, the Council will apply national policy to protect their openness and character, and retain the local distinctiveness All development should incorporate new or enhance existing green infrastructure of an appropriate size, type and standard. Where on-site provision is not possible, financial contributions will be sought to make appropriate provision for open space and green infrastructure. International, national and local sites of biological and geological conservation importance will be protected having regard to the hierarchy of designated sites and the potential for appropriate mitigation. Measures that seek to preserve, restore and enhance local ecological networks and priority habitats/species will be required where necessary.	The Transmission Assets do not affect the areas of green infrastructure identified in CS6 Green Infrastructure of the Blackpool Local Plan 2012-2027 as these lie outside the Onshore Order Limits. Where practicable, the Applicants have looked to provide a coordinated approach to the design and development of mitigation and enhancement measures. This has included, for example, a coordinated approach to the design at the onshore substation sites to incorporate ecological, drainage and landscape considerations, that will result in wider environmental gains. The level of importance of ecological features is discussed in **section 3.6** and summarised in **Table 3.17.** The significance of an effect is determined by the importance and sensitivity of a site or other ecological feature, as well the magnitude of the impact as summarised in **Table 3.24**. Impacts on important ecological features and mitigation for adverse effects, including those on ecological networks, are discussed in **section 3.11.** Impacts in relation to open space and public rights of way networks are set out in Volume 3, Chapter 6: Land use and recreation of the ES. Impacts in relation to the Green Belt are set out in the Planning

Policy	Key provisions	How and where considered in the ES
		Statement (document reference J28).
Policy DM35 – Biodiversity	1. Development proposals will be required to: a. result in no loss or harm to biodiversity through avoidance, adequate mitigation either on site or off site or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement; b. minimise the impact on biodiversity and provide net biodiversity gains through good design by incorporating biodiversity enhancements and habitat creation where opportunities exist in line with relevant legislation and guidance. SSSIs 2. Development will not be permitted in or adjacent to a Site of Special Scientific Interest where it would adversely affect, directly or indirectly, its wildlife and nature conservation importance. 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. Other sites of nature conservation value (including Local Nature Reserve and Biological Heritage Sites) 3. Development will not be permitted where it would adversely affect County Heritage Sites – biological or geological - and other sites of importance to nature 108 conservation interests, including all ponds in the Borough. Where in exceptional circumstances the benefits of development proposals clearly outweigh the extent of ecological or geological harm, developers will be required to compensate for such harm to the fullest practicable extent compatible with the conservation interests of the site. Protected Species 4. Development will not be permitted if after mitigation or compensation it would have an adverse impact on animal or plant species protected under national or international legislation. Development proposals should ensure that species and habitats set out in the UK and Local Biodiversity Action Plans will be protected and where possible enhanced. Where development is permitted, adequate compensatory measures must be undertaken to sustain and enhance the species and its habitat.	All relevant designated sites and areas for wildlife conservation and species afforded extra protections under The Conservation of Habitats and Species Regulations 2017 and Schedule 5 of the Wildlife and Countryside Act 1981 are discussed in Volume 3, Annexes 3.1 to 3.15 of the ES. This information is summarised in **section 3.6** of this chapter. Assessment of the impacts and effects of the Transmission Assets relevant for onshore ecology are discussed in **section 3.11**, with details of effects on SSSIs and other designated sites set out in **sections 3.11.2, 3.11.4** and **3.11.5**. Mitigation measures (Commitments) are discussed in **section 3.8**. An assessment of the impacts and effects of the Transmission Assets on agricultural land is presented in section 6.11 of Volume 3, Chapter 6: Land use and recreation of the ES.

Policy	Key provisions	How and where considered in the ES
	Agricultural Land 5. Development which is likely to lead to the loss of the best and most versatile agricultural land (Grades 1, 2 and 3a) will not be permitted unless supported by other policies in the plan or it is demonstrated that the loss is outweighed by other planning considerations.	
Preston Local Plan 2012-2026 Site Allocations and Development Management Policies (Adopted July 2015)		
Policy EN10 – Biodiversity and nature conservation	In Preston, Biodiversity and Ecological Network resources will be protected, conserved, restored and enhanced: Priority will be given to: . i. Protecting and safeguarding all designated sites of international, national, regional, county and local level importance including all Ramsar sites, Special Protection Areas, Special Areas of Conservation, national nature reserves, sites of special scientific interest and biological heritage sites, S41 Habitats of Principal Importance, geological heritage sites, local nature reserves and wildlife corridors together with any ecological network approved by the Council; lii. Protecting, safeguarding and enhancing habitats for European, nationally and locally important species; . iii. The ecology of the site and the surrounding area (safeguarding existing habitats/features such as but not exclusive to trees, hedgerows, ponds and streams), unless justified otherwise. . iv. When considering applications for planning permission, protecting, conserving, restoring and enhancing Preston's ecological network and providing links to the network from and/or through the proposed development site. In addition development must adhere to the provisions set out below: . a.The production of a net gain in biodiversity where possible by designing in wildlife and by ensuring that any adverse impacts are avoided or if unavoidable are reduced or appropriately mitigated and/or compensated; . b.The provision of opportunities for habitats and species to adapt to climate change; . c.The support and encouragement of enhancements which contribute to habitat restoration; . d. Where there is reason to suspect that there may be protected habitats/species on or close to a proposed development site, the developer will be expected to carry out all necessary surveys in the first instance; planning applications must then be accompanied by a survey assessing the presence of such habitats/species and, where appropriate, make provision for their needs; . e. In exceptional cases, where the need for development in social or economic terms is	Important areas for onshore ecology and ecological networks are discussed in Volume 3, Annex 3.1: Onshore ecology desk study technical report and Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report. Assessment of the impacts and effects of the Transmission Assets relevant for onshore ecology are discussed in **section 3.11**. Mitigation measures (Commitments) are discussed in **section 3.8**. For the Transmission Assets, biodiversity benefit will be delivered within identified biodiversity benefit areas within the Onshore Order Limits. Further details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11). Impacts in relation to climate change are considered in Volume 4, Chapter 1: Climate change of the ES.

Policy	Key provisions	How and where considered in the ES
	considered to significantly outweigh the impact on the natural environment, appropriate and proportionate mitigation measures and/or compensatory habitat creation and/or restoration of at least equal area, quality and diversity will be required through planning conditions and/or planning obligations. The following definition of what constitutes damage to natural environment assets will be used in assessing applications potentially impacting upon assets: 1. Loss of the undeveloped open character of a part, parts or all of the ecological network; 2. Reducing the width or causing direct or indirect severance of the ecological network or any part of it; 3. Restricting the potential for lateral movement of wildlife; 4. Causing the degradation of the ecological functions of the ecological network or any part of it; 5. Directly or indirectly damaging or severing links between green spaces, wildlife corridors and the open countryside; and 6. Impeding links to ecological networks recognised by neighbouring planning authorities.	
Policy EN11	Planning permission will not be granted for development which would have an adverse effect on a protected species unless the benefits of the development outweigh the need to maintain the population of the species in situ. Should development be permitted that might have an effect on a protected species planning conditions or agreements will be used to: . a) Facilitate the survival of the individual species affected; . b) Reduce the disturbance to a minimum; and . c) Provide adequate alternative habitats to sustain the viability of the local population of that species.	The specific species that may be impacted by the Transmission Assets are identified in **Table 3.17** and an assessment of the impacts for these specific species is set out in **section 3.11**. Mitigation measures (Commitments) are discussed in **section 3.8**.
Central Lancashire Adopted Core Strategy		
Green Infrastructure – 18	Manage and improve environmental resources through a Green Infrastructure approach to: (a) protect and enhance the natural environment where it already provides economic, social and environmental benefits; (b) invest in and improve the natural environment, particularly; i. the river valley networks including: • The River Ribble at Penwortham and south to Lostock Hall and Bamber Bridge, to create a 'central park' area incorporating footpaths, cycleways and a Local Nature Reserve;	Refer to Volume 3, Chapter 10: Landscape and visual resources of the ES for information on landscape enhancements. Details of measures proposed to conserve biodiversity are set out in **section 3.11**. As described in **section 3.11,** the ecological mitigation and compensation measures include enhancement of land at Lea Marsh that supports measures to improve the

Policy	Key provisions	How and where considered in the ES
	• Savick Brook upstream of Preston; • The River Darwen between Roach Bridge and Walton-le-Dale; and • The Yarrow and Cuerden Valley Parks. ii.the canal networks including: • The Lancaster Canal into Preston; and • The Leeds and Liverpool Canal through Chorley and Adlington. iii. where it contributes to the creation of green wedges and the utilisation of other green open spaces that can provide natural extensions into the countryside. (c) secure mitigation and/or compensatory measures where development would lead to the loss of, or damage to, part of the Green Infrastructure network.	Savick Brook upstream of Preston by improving habitat for riparian species and enhancing the ecological value of land within the catchment.

3.2.5 Biodiversity Net Gain

3.2.5.1 Biodiversity Net Gain (BNG) has been defined (Chartered Institute of Ecology and Environmental Management (CIEEM) *et al*., 2019) as:

- development that leaves biodiversity in a better state than before.

3.2.5.2 The Environment Act 2021 introduced biodiversity gain into the Planning Act 2008 regime with a biodiversity net gain objective.

3.2.5.3 The Environment Act 2021 defines the biodiversity gain objective as at least a 10% increase in the pre-development biodiversity value of the on-site habitat (although the Act gives the Secretary of State the power to change this percentage). It is also identified that there may be cases when some types of developments are unable to deliver a 10% gain and a different percentage requirement may be applied. The Environment Act 2021 requires that BNG is measured using the BNG assessment metric published by Defra (Defra, 2024).

3.2.5.4 For terrestrial development consented under the Planning Act 2008, the mandatory BNG requirement should commence no later than 2025 for all projects accepted for examination through the Planning Act 2008 regime. Projects which have been accepted for examination by the Planning Inspectorate before the specified commencement date would not be required to deliver mandatory BNG, ensuring projects which are at a sufficiently advanced stage do not need to then identify scheme amendments (and potentially additional land) to meet the mandatory net gain requirement.

3.2.5.5 Consultation on BNG regulations and implementation was launched in 2022 (Defra, 2022). Following this consultation, the Government provided a response to clarify current policy positions and a summary of the responses received, including additional clarification regarding the application of BNG under the Planning Act 2008. This included the following.

- The Government intends to apply BNG for projects under the Planning Act 2008 without any broad exemptions other than the provision made for development on irreplaceable habitats. Using the same broad approach will help to create consistency between different types of projects, reducing the scope for confusion and the need to define requirements in reporting.
- The Government intends to stipulate that off-site gains will need to be recorded in a biodiversity gain site register, as is the case for development under the Town and Country Planning Act 1990. The 'portfolio approach' could allow for one net gain 'donor' site to generate enhancements that support a number (or portfolio) of a project's needs.
- The Government intends to keep the approach broadly consistent with the Town and Country Planning Act approach, meaning that developers or scheme promoters will need to prepare a form of biodiversity gain plan and a completed biodiversity metric.
- Some projects need to include significant areas for environmental mitigation within their project boundaries. The Government does not intend to make a distinction between on-site habitats (which are subject to BNG) and any dedicated environmental mitigation areas included in the project boundary. This maintains consistency with the approach for Town and Country Planning Act 1990 development.
- The minimum duration for secured off-site biodiversity gains will be specified in biodiversity gain statements. The minimum duration for which biodiversity gains must be secured will be initially set at 30 years. This will help to ensure that the market for biodiversity gains can function fluidly across consenting regimes. The Environment Act 2021 includes a requirement to keep this duration under review, and the minimum duration would be increased in line with any increases to the minimum for Town and Country Planning Act development. This will not apply retrospectively to existing gain sites or developments which have already received consent and would be done with sufficient notice to allow industry to plan for the transition.
- The Government is not intending to make any new provisions for compulsory acquisition. They will consider providing guidance or reference in biodiversity gain statements that outlines the reasonable alternatives developers should explore to deliver net gain before they consider compulsory acquisition of land.
- Irreplaceable habitats are defined in the Biodiversity Net Gain requirements (Irreplaceable Habitat) Regulations 2024). A planning authority can only approve a biodiversity gain plan if it is satisfied that the adverse effect of the development on the biodiversity of the irreplaceable habitat is minimised and appropriate arrangements have been made for the purpose of compensating for any impact which do not include the use of biodiversity credits.

3.2.5.6 At this stage, a number of areas have been identified and included within the Onshore Order Limits to allow for biodiversity benefit. Measures which would

be delivered as part of the Onshore Biodiversity Benefit Statement (document reference J11) include, but are not limited to:

- hedgerow and woodland planting;
- construction of new ponds;
- creation of species rich grassland and meadow; and
- condition improvement measures for existing habitats, hedgerows and watercourses.

3.2.5.7 Further details regarding the approach to delivering biodiversity benefit is set out in the Onshore Biodiversity Benefit Statement (document reference J11).

3.2.6 Relevant guidance

3.2.6.1 The collation of baseline data for onshore ecology and the assessment presented within this chapter has taken into account the following guidance documents:

- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018);
- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications (Natural England, 2022);
- Biodiversity – Code of Practice for Planning and Development: BS 42020:2013 (British Standards Institution, 2013) and
- Ancient woodland, ancient trees and veteran trees: advice for making planning decisions (Natural England and Forestry Commission, 2022)

3.3 Consultation and engagement

3.3.1 Scoping

3.3.1.1 On 28 October 2022, the Applicants submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects for the construction, operation and maintenance and decommissioning phases of the Transmission Assets.

3.3.1.2 Following consultation with the appropriate statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on 8 December 2022.

3.3.2 Evidence plan process

3.3.2.1 Following scoping, consultation and engagement with interested parties specific to onshore ecology has continued. An Evidence Plan Process has been developed for the Transmission Assets, seeking to ensure engagement with the relevant aspects of the EIA process throughout the pre-application

phase. The development and monitoring of the Evidence Plan and its subsequent progress has been undertaken by the Evidence Plan Process steering group. The steering group comprises the Planning Inspectorate, the Applicants, the Marine Management Organisation, Natural England, Historic England, the Environment Agency and the Local Planning Authorities as the key regulatory and bodies.

3.3.2.2 As part of the Evidence Plan Process, EWGs were set up to discuss and agree topic-specific matters with the relevant stakeholders. Attendees for the Onshore ecology and onshore and intertidal ornithology EWGs included Lancashire County Council, Natural England, the Royal Society for the Protection of Birds (RSPB), Preston City Council, Fylde Borough Council, Wildlife Trusts, Tameside (ecological advisor to the local planning authorities), Greater Manchester Ecology Unit and the Environment Agency.

3.3.2.3 Six EWG meetings have taken place between March 2023 and June 2024. At the first meeting in March 2023, high level findings and the proposed survey methodologies were presented for agreement. A second EWG was held in September 2023 where an overview of the content of the Preliminary Environmental Information Report (PEIR) was presented, and initial discussion of biodiversity benefit methodology was held. The subsequent meeting in December 2023 provided detail on trenchless techniques, further detail on the application of biodiversity benefit to the project (including, policy, principles, approach, preliminary assessment results and initial findings) and an update on collaboration with stakeholders.

3.3.2.4 Following the EWG meeting in December 2023, a technical note setting out the proposed approach to biodiversity benefit was issued to the EWG. This note included key considerations for the delivery of biodiversity benefit for the Transmission Assets and the Applicants' proposed approach to biodiversity benefit.

3.3.2.5 Feedback was received following this technical note from the Environment Agency, confirming their agreement with the proposed approach, subject to commitments that:

- there would be no impact (temporary or permanent) on the areas subject to HDD; and
- the land along the cable corridor and associated temporary works areas are returned to their baseline condition.

3.3.2.6 Feedback was also received from Natural England, who noted that although they note that *'the proposed approach to BNG does not meet the normal requirements for BNG to be achieved … it is worth noting that BNG does not become mandatory for NSIPs until 2025'*. Additionally, Natural England *'welcome the proposal to engage with landowners affected by the Transmission Assets to explore voluntary agreements to deliver on site BNG associated with the onshore substation areas, and we would be interested in receiving updates of your progress with this'*.

3.3.2.7 A meeting that took place in January 2024 included discussion of responses to statutory consultation including section 42 responses, information on scheme design including refinements to site selection and the use of

trenchless techniques and review agreement and commitments. The meeting on the 31 May 2024 discussed the anticipated survey coverage for the ES and provided a summary note on survey coverage, seeking comment from the EWG. The meeting on 27 June 2024 included discussion of the approach to mitigation, enhancement and biodiversity benefit. This also included an update on the progress around securing areas to deliver on site biodiversity benefit associated with the onshore substation areas, as requested by Natural England in their response.

3.3.2.8 The overarching methodologies presented have been agreed by all consultees following presentation, and comments on detailed methodologies were provided in September 2023. Minor amendments to the survey methodologies, in relation to the feedback provided by Natural England and the Environment Agency, were issued as part of the PEIR. Any subsequent updates to the survey methodologies were discussed as part of the EWG on 31 May 2024.

3.3.3 Statutory consultation responses

3.3.3.1 The preliminary findings of the EIA process were published in the PEIR in October 2023. The PEIR was prepared to provide the basis for formal consultation under the Planning Act 2008. This included consultation with statutory bodies under section 42 of the Planning Act 2008.

3.3.4 Summary of consultation responses received

3.3.4.1 A summary of the key items raised specific to onshore ecology is presented in **Table 3.5,** together with how these have been considered in the production of this chapter. Formal responses are provided for all consultation responses received in the Consultation Report (document reference E1).

Table 3.5: Summary of key consultation comments raised during consultation activities undertaken for the Transmission Assets relevant to onshore ecology

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
December 2022	Scoping Opinion (Planning Inspectorate)	The Inspectorate acknowledges that data and knowledge regarding the baseline environment exists from surveys, assessments and postconstruction modelling for other proposed and existing offshore wind projects. The Inspectorate understands the benefits of utilising this information to supplement site specific survey data but advises that suitable care should be taken to ensure that the information in the ES remains representative and fit for purpose. This should include taking into account the impact of more recent developments that have occurred subsequent to when the data was collected. Similarly, where data from other wind farm projects is used to support the assessment, the ES should confirm that these are truly comparable for example in terms of the size of the foundations. The Applicants should make effort to agree the suitability of information used for the assessments in the ES with relevant consultation bodies. (Paragraph 2.2.1 of the Scoping Opinion).	Baseline data from other assessments have been considered and are presented, where valid, in **section 3.6** of this chapter.
December 2022	Scoping Opinion (Planning Inspectorate)	Any mitigation measures identified as necessary from the assessment should be clearly explained and the ES should set out how these would be secured through the DCO process. (Paragraph 2.2.4 of the Scoping Opinion).	Measures adopted as part of the Transmission Assets (as 'Commitments') will be secured through the Commitments Register and are listed in Volume 1, Annex 5.3: Commitments Register of the ES. Commitments relevant to onshore ecology are listed in **section 3.8**, with details of how they will be secured.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
December 2022	Scoping Opinion (Planning Inspectorate)	On the basis that the activities associated with the operation and maintenance of the onshore elements of the Transmission Assets are unlikely to result in accidental spills/contaminant release and given that such effects are capable of mitigation through standard management practices, the Inspectorate agrees pollution caused by accidental spills/contaminant release on protected habitats and species during operation can be scoped out of the assessment. The ES should however detail any operational controls on maintenance works. (Paragraph 3.13.1 of the Scoping Opinion).	Protective measures mitigating the risk of pollution caused by accidental spills/contaminants release during operation have been adopted as part of the Transmission Assets and are listed in **section 3.8**. An Outline Pollution Prevention Plan is provided as part of the application for development consent (document reference J1.4).
December 2022	Scoping Opinion (Planning Inspectorate)	Limited information is presented on survey methods for a range of species and habitats. The Inspectorate advises that sufficient baseline data is collected for any habitats and species along the cable route, so that potential impacts can be fully assessed. We advise that all surveys are discussed and agreed through an Evidence Plan process. (Paragraph 3.13.4 of the Scoping Opinion).	The methodologies for the onshore ecology surveys were presented to the first EWG in March 2023 as part of the Evidence Plan Process. Proposed survey methodologies were subsequently sent to the EWG for comment on 15 August 2023. Comments from Natural England and the Environment Agency were received, and final methodologies were discussed at the fifth EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter.
December 2022	Scoping Opinion (Planning Inspectorate)	The Scoping Report proposes to scope out consideration of these receptors on the basis that the site selection and route refinement process will aim to avoid or reduce potential impacts on habitats and species. In the absence of baseline evidence in respect of these species, the Inspectorate is unable to scope this matter out. (Paragraph 3.13.5 of the Scoping Opinion).	Noted. Discussions taken forward through the engagement process with consultees (through EWGs). The comment relates to red squirrel, brown hare, dormice, fish, and aquatic invertebrates. Following issue of survey methodologies to the EWGs, agreement to scope out brown hare and dormice surveys was obtained. Fish and aquatic invertebrates were scoped in for survey and assessment.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
December 2022	Scoping Opinion (Planning Inspectorate)	On the basis that the activities associated with the operation and maintenance of the onshore elements of the Transmission Assets would require no additional land take and are unlikely to result in any temporary or permanent loss of habitat, the Inspectorate is content to scope out this matter.	Noted and scoped out of the assessment.
December 2022	Scoping Opinion (Lancashire County Council)	It is noted that the scoping report makes mention of the location of a number of environmental records some of which are held by the Council – for instance, the Historic Environment Team (HET) are curators for Lancashire's Historic Environment Record Centre and, under the Lancashire Environment Record Network, the Council is also the local environmental record centre. The Council would therefore welcome any future consultation on proposed sources to be used in compiling the environmental impact assessment and assistance with requests from the Applicant for local information held in the preparation of the environmental impact assessment where possible.	As part the baseline characterisation, a range of data sources have been reviewed and suitable data sources are presented in **section 3.5**.
December 2022	Scoping Opinion (Natural England)	<u>Internationally Designated Sites</u> The ES should thoroughly assess the potential for the proposal to affect designated sites. Internationally designated sites (e.g., designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) fall within the scope of the Conservation of Habitats and Species Regulations 2017. In addition paragraph 181 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential of possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites (NB. Sites falling within the scope of regulation 8 of the Conservation of Habitats and Species Regulations 2017 are defined as 'habitats sites' in the NPPF). The ES should include a full assessment of the direct and indirect effects of the development on the features of special	Features of internationally designated sites were considered when identifying the list of Important Ecological Features (IEFs) listed in **section 3.6.4** of this chapter. The assessment of effects for the Transmission Assets has been assessed in **section 3.11** of the ES.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects. (Section 2.2 of Natural England's response within the Scoping Opinion).	
December 2022	Scoping Opinion (Natural England)	<u>Protected Species</u> Species protected by the Wildlife and Countryside Act 1981 and by the Conservation of Habitats and Species Regulations 2017 The ES should assess the impact of all phases of the proposal on protected species (including, for example, pinnipeds (seals), cetaceans (including dolphins, porpoises whales), fish (including seahorses, sharks and skates), marine turtles, birds, marine invertebrates, GCN, reptiles, water voles, badgers and bats, etc.). Information on the relevant legislation protecting these species can be reviewed on the following linkttps://www.gov.uk/government/publications/protectedmarine-species. Natural England does not hold comprehensive information regarding the locations of species protected by law but advises on the procedures and legislation relevant to such species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, NBN Atlas, groups and individuals; and consideration should be given to the wider context of the site, for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment. The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.	Consideration of species protected by the Wildlife and Countryside Act 1981 and by The Conservation of Habitats and Species Regulations 2017 has been given in identifying the list of IEFs presented in **section 3.6.4**. Site specific surveys are summarised in **section 3.6.2**with further details provided in the annexes to this chapter. .

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and where necessary, licensed, consultants. (Section 2.3 of Natural England's response within the Scoping Opinion).	
December 2022	Scoping Opinion (Natural England)	Habitats and Species of Principal Importance The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities Act 2006. Section 40 of the Natural Environment and Rural Communities Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available here https://www.gov.uk/guidance/biodiversity-duty-public-authority-duty-to-have-regard-toconserving-biodiversity. Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats, 'are capable of being a material consideration…in the making of planning decisions'. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP. (Section 2.6 of Natural England's response within the Scoping Opinion).	'Habitats and Species of Principal Importance' within the Section 41 of the Natural Environment and Rural Communities Act 2006 have been considered in identifying the list of IEFs presented in **section 3.6.4.**
December 2022	Scoping Opinion (Natural England)	Contacts for Local Records Natural England does not hold local information on local sites,	As part of the baseline characterisation, a range of data sources have been reviewed

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		local landscape character and local or national biodiversity priority habitats and species. We recommend that you seek further information from the appropriate bodies (which may include the local records centre, the local wildlife trust, local geoconservation group or other recording society and a local landscape characterisation document). Section 2.7 of Natural England's response within the Scoping Opinion).	and suitable data sources (e.g., local conservation groups) are presented in **section 3.6**.
December 2022	Scoping Opinion (Natural England)	<u>Water Quality</u> Increases in suspended sediment concentrations (SSC) during construction and operation (e.g. future dredging works) have the potential to smother sensitive habitats. The ES should include information on the sediment quality and potential for any effects on water quality through suspension of contaminated sediments. The EIA should also consider whether increased SSC resulting are likely to impact upon the interest features and supporting habitats of the designated sites. The ES should consider whether there will be an increase in the pollution risk as a result of the construction or operation of the development. (Section 4 of Natural England's response within the Scoping Opinion).	The impact of increased SSC upon the interest features of the designated sites is assessed as part of temporary habitat loss/disturbance and presented in **section 3.11**. The ES also considers the potential for increases in pollution risk.
December 2022	Scoping Opinion (Natural England)	As export cable installation is yet to be determined, we advise that surveys are designed as such to ensure that impacts from trenchless methods, open cut trenching or a combination of both can be fully assessed. (Annex 2 of Natural England's response within the Scoping Opinion).	Assessment of significant effects is based on the Maximum Design Scenario (MDS) presented in **section 3.9.**
December 2022	Scoping Opinion (Natural England)	There is a lack of detail on survey methodology for many of the surveys set out. Details of survey methodology and timings are vague at this stage and for some no approach to survey is	The methodologies for the onshore ecology surveys were presented to the first EWG in March 2023 as part of the Evidence Plan

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		stated, it is not possible to confirm if the surveys will follow good practice guidelines. Natural England advise that sufficient baseline data is collected for any habitats and species along the cable route, so that potential impacts can be fully assessed. The baseline data needs to be undertaken at the relevant time of year and of sufficiently long enough period to determine trends.	Process. Proposed survey methodologies were subsequently sent to the EWG for comment on 15 August 2023. Comments from Natural England and the Environment Agency were received, and final methodologies were discussed at the fifth EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter and Volume 3, Annex 3.2: Onshore ecology survey methodologies of the ES.
December 2022	Scoping Opinion (Natural England)	Natural England welcomes the commitment stated that detailed scope, methodologies, and extents of the site-specific surveys stated within section will be discussed and agreed with Natural England prior to commencement. We advise that this should take place at the earliest opportunity to ensure that sufficient data is collected to inform the ES.	The methodologies for the onshore ecology surveys were presented to the first EWG in March 2023 as part of the Evidence Plan Process. Proposed survey methodologies were subsequently sent to the EWG for comment on 15 August 2023. Comments from Natural England and the Environment Agency were received, and final methodologies were discussed at the fifth EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter and Volume 3, Annex 3.2: Onshore ecology survey methodologies of the ES.
December 2022	Scoping Opinion (Environment Agency)	We note that in Table 7.4 on page 254 fish are scoped out of onshore impact. We agree that fish and river surveys are not required if HDD is used for river crossings. However, if open cut is required then the impact on fish and river habitats in these locations will need to be assessed.	Following further consultation through the EWG process, surveys for fish and eel have been undertaken and are reported in **section 3.6** of this chapter.
December 2022	Scoping Opinion (South Ribble Council)	'The Marine Management Organisation, RSPB and Natural England are better placed to consider the Marine environment. As regards the Terrestrial impacts of the proposals, I would broadly agree with the Scope of proposed Ecology surveys and	Site-specific surveys and review of existing data sources were undertaken to

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		assessments as detailed in the EIA Scoping Report, but I would particularly emphasise the following requirements – - Habitat Regulations Assessment (HRA) will be required for potential impacts of the development on European designated sites, including the Ribble and Alt Estuaries SPA and Ramsar site. An important element of the HRA should be consideration of functionally linked land. - The development should closely follow the mitigation hierarchy; avoidance of harm should be the preferred approach at all times, before seeking to mitigate or compensate for any ecological impacts. - The scheme should be required to deliver an overall net gain in biodiversity, as measured using the Defra Metric 3.1. There may be opportunities to create and improve habitats over buried cables which could make a valuable contribution to net gain, and these opportunities must be fully explored'	characterise the baseline presented in **section 3.6**. The impacts of the Transmission Assets in terms of birds and sites designated for ornithology, including the Ribble and Alt Estuaries SPA and Ramsar site are considered in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The approach to mitigation is detailed in **section 3.8.** Details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11).
December 2022	Scoping Opinion (Environment Agency)	Biodiversity Net Gain will be requested for this project. The project should consider where habitat improvements can be achieved as part of the scheme. We would expect to see this information provided in the Environmental Statement.	Details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11).
23 March 2023	EWG	The approach to BNG was discussed with the EWG. Biodiversity benefit is proposed as part of the Transmission Assets.	Measures adopted as part of the Transmission Assets (commitments) are detailed in **section 3.8.** Details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11).
23 March 2023	EWG	Applicants are to issue survey methodologies to the EWG, for comment.	The methodologies for the onshore ecology surveys were presented to the first EWG in March 2023 as part of the Evidence Plan Process. Proposed survey methodologies

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			were subsequently sent to the EWG for comment on 15 August 2023. Comments from Natural England and the Environment Agency were received, and minor amendments to the survey methodologies were issued as part of the PEIR. Any subsequent updates to the survey methodologies were discussed as part of the EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter and Volume 3, Annex 3.2: Onshore ecology survey methodologies of the ES.
23 March 2023	EWG (Lancashire County Council)	Red squirrel *Sciurus vulgaris* populations: This species' known distribution in Lancashire is confined to an area between Crosby and Southport. There is a lack of suitable habitat for this species within the Transmission Assets Order Limits. It is, therefore, very unlikely that the area will be of material importance for the species and nor is it likely to regularly occur within the onshore ecology survey area. Therefore, it is proposed to scope surveys for this species (and assessment of effects) out of EIA process. Other than a need to check against Lancashire Environment Record Network (LERN) data, Lancashire County Council confirmed no objections made to scoping out red squirrel.	Survey methodologies are summarised in **section 3.5**.
23 March 2023	EWG (Lancashire County Council)	Hazel dormouse *Muscardinus avellanarius*: One potential area for hazel dormouse has been identified to date (the golf course at St Annes Old Links adjacent to Blackpool Airport). However, this appears fragmented and separate from any other suitable habitat. Suitable habitat for this species is very limited throughout the survey area. Therefore, it is proposed to scope surveys for this species (and assessment of effects) out of the EIA process. Other than a need to check against LERN data, Lancashire County Council confirmed no objections made to scoping out hazel dormouse.	Survey methodologies and impact assessment methodologies are summarised in **sections 3.5 and 3.10** respectively**.**

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
23 March 2023	EWG (Lancashire County Council)	Brown hare *Lepus europaeus*: This species will likely occur in the area. However, impacts are not likely to be significant as habitat loss will be temporary. A precautionary approach to work will be adopted to include the presence of an ecological clerk of works during works. Any pits created during works should either be covered or have mammal ramps positioned within them for animals to escape. Therefore, no further surveys are considered necessary and it is proposed to scope out surveys for this species (and assessment of effects) from the EIA. Other than a need to check against LERN data, Lancashire County Council confirmed no objections made to scoping out brown hare.	Survey methodologies are summarised in **section 3.5**.
23 March 2023	EWG (Tameside: Ecological Advisor to Local Planning Authority)	A query was raised regarding the definition of 'temporary' habitat loss.	Temporary habitat loss is considered in **section 3.11**.
23 March 2023	EWG (Natural England)	The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List.	See baseline environment **section 3.6** and impact assessment methodologies **section 3.10**.
23 March 2023	EWG (Natural England)	Due to the number of ponds scoped into the assessment (474 in the survey area) there would be a significant time constraint if all were to be surveyed. Therefore, it is proposed to seek a district licensing (DLL) approach. Maps provided in the slide deck highlight that the red line boundary coincides with areas of green and yellow zone for DLL which makes Transmission Assets eligible for this approach. It is advised to take this approach and discontinue all surveys for newts. Natural England to provide further comment.	See baseline environment **section 3.6**. The measures adopted as part of the Transmission Assets (commitments) are detailed in **section 3.8**. The Applicants have continued discussions on this with Natural England, with Natural England having no objection in principle and requesting the Applicants make a formal request.
13 September 2023	EWG	Approach to BNG further discussed with EWG, including a presentation overview of the methodology proposed. The EWG agreed to provide comment on these following receipt of the	Methodologies are summarised in **section 3.5**. See baseline environment **section 3.6**.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		presentation materials, but a separate BNG workshop will also be held. Summary of survey and desk-based review findings was presented, together with an overview of the content of PEIR assessment.	Details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11). A separate biodiversity benefit EWG workshop was held on 18 December 2023, which discussed the proposed approach to biodiversity benefit by the Applicants and was followed by a technical note issued following the EWG. This technical note set out the biodiversity benefit proposals by the Applicants, which are discussed in more detail in the Onshore Biodiversity Benefit Statement (document reference J11).
September 2023	EWG (Natural England)	Natural England provided comments on the proposed survey methodologies for the following species: • reptiles; and • bats. Both comments outlined refinements to the proposed methodologies.	The survey methodologies for reptiles and bats were updated to reflect these comments. These methodologies were updated in the PEIR and discussed in the fifth EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter and Volume 3, Annex 3.2: Onshore ecology survey methodologies of the ES.
September 2023	EWG (Environment Agency)	The Environment Agency provided comments on the proposed survey methodologies for the following species: • fish; • otter and waver vole: and • white clawed crayfish. The comments provided for fish stated that the Environment Agency are satisfied that the proposed methodologies are suitable, and the response stated that the Environment Agency	The survey methodologies for water vole were updated to reflect these comments. These methodologies were updated in the PEIR and discussed in the fifth EWG on 31 May 2024. Further details are presented in **section 3.3.2** of this chapter and Volume 3, Annex 3.2: Onshore ecology survey methodologies of the ES.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		have no records on white clawed crayfish in the watercourses within the indicative red line boundary. The comments provided for otter and water vole surveys brought attention to the fact that the 2011 Water Vole Conservation Handbook was referenced, but has been superseded by the updated 2016 version.	
November 2023	Annex 6 Natural England	One of the main justifications of having less significant impact on ecological receptors is the use of Horizontal Directional Drilling (HDD) or alternative trenchless techniques. However, no evidence is provided within the report as to why this approach is less intrusive and will have less impact. Further evidence should be provided regarding this approach, to set out why using these techniques will have less of impact including description, predicted noise levels, operation and methodology. The developer should link to any evidence to support the justification it will be less intrusive and limit impacts on ecological receptors.	Direct pipe trenchless installation is proposed beneath the sand dunes. This technology will ensure there is no open trenching through the dunes (see CoT44). Instead, the drill will pass beneath the dunes at depth. Where necessary consideration of any indirect effects on the habitat and measures to avoid, minimise or mitigate these are provided in **section 3.11** of the ES. Direct pipe or microtunnelling is proposed beneath the River Ribble to ensure that there would be no direct impacts on the river habitats. The risk of bentonite breakout will be controlled through the bentonite breakout plan. An Outline Bentonite Breakout Plan (document reference J1.13) is provided as an annex to Outline Code of Construction Practice (CoCP) (document reference J1). Crossing techniques are set out within Volume 1, Annex 3.2: Onshore Crossing Schedule of the ES, which is submitted as part of the application for development consent. Further information on the proposed approach to construction is provided in

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			Volume 1, Chapter 3: Project description of the ES.
November 2023	Annex 6 Natural England	Natural England raised several comments with regard to survey completeness and methodologies. These are included below. Incomplete surveys with data gaps. The current assessment does not include a range of surveys including reptile and invertebrates. These surveys may change some of the conclusions, especially for impacts on Coastal Dune Habitat and Lytham St Annes Dunes SSSI. The ongoing Fylde Dune Project successfully re-established Sand Lizards in these dunes the other year and without the correct surveys being undertaken, the proposed development may impact these species. Sand Lizards are a European Protected Species. For reptile surveys, sand lizard surveys should be undertaken as sand lizards have been successfully re-established within coastal dunes of which the assets will pass through. As this assessment is based on incomplete/missing surveys, the submitted ES needs to present the assessment with full survey data. Specific Sand Lizard surveys also need to be carried out for the section of coastal dune habitat that the transmission cable corridor crosses. Detail of the methodology that should be followed for the Sand Lizard survey is provided below. For Sand Lizard surveys, Natural England would expect a minimum of 20 visits carried out in suitable weather conditions, focussing primarily on the months of April and May for adults and late August to October for hatchling observations. After these surveys have been undertaken, the developer will then need to reassess the impacts on ecological receptors to see if there are any changes to the conclusions, especially looking if	As discussed in the EWGs, further surveys have taken place in 2024 to support the ES, including for: • Habitats (phase 1 habitat survey), vegetation (NVC) and river morphology; • aquatic and terrestrial invertebrates; • GCN and reptiles; • badger; • bats; and • otter and water vole. Further information is provided in **section 3.6.2**. No surveys for sand lizard have been undertaken as impacts will be avoided through the use of direct pipe trenchless installation. Further surveys would cause unnecessary disturbance to dune habitats and the data from would not improve the basis for assessment. Data on their distribution in 2022 and 2023, following their introduction to the Fylde dunes in 2018 has been provided by the sand dune project. Further surveys are considered to cause unnecessary disturbance to dune habitats given that the data from would not improve the basis for assessment. The findings of phase 1 habitat, NVC and hedgerow surveys are provided in Volume

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		the species or NVC communities play an essential role in maintaining the functioning/ecosystem of the ecological receptors, and if they will be impacted by the proposed development, especially in relation to the coastal sand dunes. Please also see below for further detail on our baseline survey guidance. The report notes that "botanical surveys will be undertaken in 2023 and 2024 for all necessary land parcels to clarify and provide more detailed Phase 1 survey habitat results, as required. In addition, habitat parcels with potential to provide botanical diversity will have National Vegetation Classification (NVC) surveys undertaken by qualified botanists." Please ensure this includes areas where HDD are proposed. Currently the Phase 1 Habitat Survey report notes that around 63% of the Phase 1 survey area has been surveyed. Some of this has not yet been digitised (including the habitats covering Lytham St Annes Dunes SSSI and saltmarsh along the river Ribble). It is noted that some of the target notes shown in Fig 1.3a-i (Vol 3. Annex 3.2 Interim Phase 1 Habitat Survey Technical Report) are missing i.e., TN233 and TN610. Baseline surveys of Lytham St Annes Dunes SSSI and saltmarsh along the River Ribble (Ribble Estuary SSSI) should include mapping to NVC level of the dune and saltmarsh habitats present, with supporting quadrat sampling. Quadrat sampling should be sufficient in coverage to ensure all community types are sampled. Additional attributes based on the Common Standards Monitoring Guidelines for sand dune should also be included. Botanical surveys for sand dunes should be undertaken in May/June, while saltmarsh surveys can be undertaken between May and August. Use of up-to-date aerial photography taken at the time of the NVC survey would be preferable.	3, Annex 3.3: Phase 1 habitat and national vegetation classification and hedgerow survey technical report of the ES, for which coverage for surveys is over 90%. Mapping is fully digitised and presented as figure in the annex, and target notes are complete and consecutive. The need for National Vegetation Classification (NVC) surveys were scoped in based on the results of phase 1 habitat surveys and the nature of the impact at each survey location. Further details can be found in Volume 3, Annex 3.3: Phase 1 habitat and national vegetation classification and hedgerow survey technical report of the ES. Further data on the distribution and status of SSSI interest features that is necessary to inform the ES has been obtained from existing reports prepared on behalf of Lancashire Wildlife Trust and Our Future Coasts, and NVC surveys have been carried out to confirm or update the findings of these reports where necessary. The potential impacts from habitat disturbance are assessed in **section 3.11.4** of this chapter.

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November 2023	Annex 6 Natural England	No detail has been provided for what is happening at the Fairhaven site. From aerial photos, this area appears to be coastal habitats with dunes and saltmarsh (although not designated, this would still be a priority habitat). Part of this area falls within the geological site – Lytham Coastal Changes SSSI. Please provide further detail for this area in the submitted ES.	The referenced site is proposed for ornithological mitigation – details are provided in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES and the Outline Ecological Management Plan (document reference J6).
November 2023	Annex 6 Natural England	Natural England raised several comments with regard to the Maximum Design Scenario (MDS) for Lytham St Annes Dunes SSSI. These are included below. As the proposed installation method for to avoid Lytham St. Anne's SSSI is HDD, it is felt that the developer has not fully considered the Maximum Design Scenario (MDS) for this designated site. The current assessment for Lytham St. Anne's Dunes SSSI (para 3.9.2.8 -3.9.2.11) notes "During construction the Transmission Assets will commit to avoiding impacts on the Lytham St Annes Dunes SSSI, as the cables will be installed beneath this habitat via HDD (or other trenchless techniques) and open trenching techniques would not be used within this habitat. Accordingly, there will be no temporary or permanent loss of this habitat type. The magnitude of impact is therefore, considered to be no change." The developer goes on to note that while the sensitivity of the habitat is High, the significance of effect is no effect. However, from experience of similar projects Natural England know that on occasions HDD can fail, or the proposed development design changes and for example Transition Joint Bays need to be moved (which presumably currently will be situated on the beach)/or additional vehicle access is required. In such scenarios by excluding any effect early in the assessment process there is a lack of detail later on if the installation methods change. Similarly full consideration of impacts should HDD not be undertaken in saltmarsh along the river Ribble (part of the Ribble	The features of Lytham St. Anne's Dunes SSSI are summarised in **Table 3.8.** Direct pipe trenchless installation is proposed from the transition joint bays to an exit pit on North Beach, with a minimum distance of 100 m from the edge of Lytham St Annes Dunes SSSI. This will avoid any direct loss of vegetation and habitats at the sand dunes at Lytham St. Annes Dunes SSSI as no open trenching will be required within this SSSI and the direct pipe will pass beneath the dunes. This is the basis for the assessment of impacts on dune slacks provided in **section 3.11.2.** This method has been selected as it is the most appropriate for use in sensitive geological settings, in part because it reduces the likelihood of collapse that is associated with cable installation using horizontal directional drilling (HDD). Impacts on the SSSI assessed within this chapter are made on this basis. The decision to use direct pipe trenchless installation was introduced to and discussed with Natural England and other stakeholders at the Environmental Working Group in June 2024.

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		Estuary SSSI). A full baseline assessment of Lytham St. Anne's Dunes SSSI should be undertaken so that should the worst-case scenario occur (i.e. HDD is not possible) sufficient ecological data is available to inform/develop suitable mitigation measures. In addition, it could be used as a baseline for post-construction monitoring (and a means to determine recovery). The SSSI citation notes that the site support classic features of dune formation and ecological succession including the widest range of foredune, yellow dune, dune grassland, acid dune grassland, dune scrub and dune slack habitats found anywhere along the Fylde Coast. The site is botanically diverse with a number of rare or scarce plant species. The developer should undertake a cable burial risk assessment for all the HDD work (including Lytham St. Anne's Dunes SSSI and the River Ribble (part of the Ribble Estuary SSSI) informed by geotechnical investigations. This should include an outline burial cable specification and installation plan which has a pollution* and contingency plan. This would help determine the likelihood (degree of confidence) of success of HDD at the given locations. *Note a Bentonite breakout plan is mentioned for the River Ribble but not for Lytham St. Annes Dunes. Exploring and detailing a maximum design scenario and other environmental constraints for offshore export cable installation at/near Blackpool Airport is critical. It is also critical that that the methodology for the trenchless technique is determined at the earliest opportunity, and in consultation with Natural England, to ensure that the impact can be avoided in the first instance. The outcomes of this assessment and any mitigation measures required to address potential impacts should be reported in the submitted ES.	The Works Plans (document reference B7) submitted with the application for development consent (and accompanying description) allow only for direct pipe in this location. Therefore, the MDS that has been used is considered to be correct. Further information on the proposed trenchless technique is provided in Volume 1, Chapter 3: Project description of the ES. Further data on the distribution and status of SSSI interest features that is necessary to inform the ES has been obtained from existing reports prepared on behalf of Lancashire Wildlife Trust and Our Future Coasts, and project-specific national vegetation classification (NVC) surveys have been carried out to confirm or update the findings of these reports where necessary. Further information on potential indirect effects arising from any hydrogeological changes and measures to avoid, minimise or mitigate these are provided in **section 3.11.2.** CoT41 states that where the onshore export cable corridor or 400 kV grid connection cable corridor crosses sites of particular sensitivity, including Lytham St Annes Dunes SSSI, a hydrogeological risk assessment will be undertaken to inform a site-specific crossing method statement which will also be agreed with the relevant authorities prior to construction. The risk of bentonite breakout at Lytham St Annes Dunes SSSI will be controlled through the bentonite breakout plan. An

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			Outline Bentonite Breakout Plan (document reference J1.13) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1).
November 2023	Annex 6 Natural England	Natural England raised several comments with regard to impacts to nationally designated sites. These are included below. There is a lack of assessment on impacts to SSSIs. The documents only seem to assess impacts on notified bird species in SSSIs not other notified features such as various habitats. An assessment is required for all SSSIs, including all direct and indirect impacts on notified features. Table 3.10 identifies the proposed development falls near several SSSIs including Newton Marsh SSSI, Lytham St Annes Dunes SSSI, Lytham Coastal Changes and serval others, including falling WITHIN Ribble Estuary SSSI. It also identified serval EU sites. However, impacts on these sites, except Lytham St Annes Dunes SSSI is not assessed within this chapter, as would be expected. If some sites are not being taken forward for detailed assessment, then Natural England would expect discussion on why they have been 'scoped out', including detailed justification.. Ribble Estuary SSSI has different notified features than Ribble & Alt SPA including habitat, so it should be assessed within this chapter. If it's decided that some SSSIs do not need detailed assessment, then the report should clearly state this, and provide justification why this conclusion was reached. There is a lack of consideration of other impacts to Lytham St Annes Dunes SSSI, particularly with regards to changes to the water table. The SSSI citation highlights "the series of exceptionally large and extensive dune slacks on either side of	Baseline characterisation of SSSIs within the study area are shown in **Table 3.8**. An assessment of the Ribble Estuary SSSI and Lytham St Annes Dunes SSSI has been provided in **sections 3.11.2 and 3.11.4** of this chapter respectively. Both of the interest features of the Newton Marsh SSSI (aggregations of golden plover and black-tailed godwit) are relevant to onshore and intertidal ornithology, rather than onshore ecology and nature conservation impacts on this SSSI are therefore assessed in Volume 3, Chapter 4: Onshore and intertidal ornithology. Please refer to Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES regarding Lytham Coastal Changes SSSI. The assessment of impacts on the sand dunes that form the reason for statutory and non-statutory designated sites is provided in **sections 3.11.4** and **3.11.5**. Impacts on sand dunes, a priority habitat, are set out in **section 3.11.10**. Assessment of impacts on key associated species: reptiles, plants and invertebrates is provided in **sections 3.11.13** and **3.11.17.** **Section 3.11.4** provides an assessment of impacts to the SSSI, including changes in

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		Clifton Drive North support a wide range of species which vary according to the depth of water and degree of moisture retention in relation to the water table". Depending on the depth of cable installation the impacts of HDD on the dune water table (i.e., the cable resulting in the dune slacks becoming drier changing the species composition) should be considered. Other impacts such as impacts of dust on the SSSIs (identified in the Air Quality chapter as being features sensitive to dust of medium sensitivity – although ruled out due to HDD methods being used and provided the dust control measures are successfully implemented, the resultant effects of the dust exposure will normally be 'not significant'.). Note nitrogen deposition to SSSIs does not appear to be covered – sand dunes are particularly sensitive to nitrogen deposition which can lead to over stabilisation through the dominance of coarse grasses. An assessment using the Air Pollution Information System should be undertaken. The effects of surface water run-off should also be considered. Consider changes to the water table at Lytham St Annes Dunes SSSI. When considering habitats, it would be good to list all the potential pressures/impacts considered.	relation to the water table, changes in air quality from emissions of nitrogen, and the impact of surface runoff and pollution.
November 2023	Annex 6 Natural England	This section sets out the mitigation hierarchy. However, from the measures listed that will be implemented, it's not clear if the full hierarchy is being followed i.e. - avoid, minimise, rectify, reduce and off-set. Provide clarification on how the measures adopted will follow the full mitigation hierarchy. In this section, there seems to be a lot of discussion around reducing, off- setting or enhancing but there's not much focus on avoidance or rectifying. Natural England advises that the developer should follow the mitigation hierarchy table and set out how they will avoid and minimise in first instance in their approach.	The approach to site selection has been based on avoiding damage to IEFs where practicable, as is set out in Volume 1, Chapter 4: Site selection and consideration of alternatives of the ES. This includes the avoidance of impacts to IEFs through the use of trenchless techniques, where possible. Further details can be found in Volume 1, Annex 3.2: Onshore crossing schedule of the ES.

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			Where temporary habitat loss is unavoidable, such as where construction accesses need to cross hedges, this will be rectified by reinstating habitats in accordance with the specifications provided in the Ecological Management Plan. An Outline Ecological Management Plan (document reference J6) is provided as part of the application for development consent.
November 2023	Annex 6 Natural England	As well as BNG Metric 4 calculator, there are other tools that can be used to identify opportunities to enhance wider benefits from nature. Advise that as well as Metric, Natural England's Environmental Benefits from Nature tool may be used to identify opportunities to enhance wider benefits from nature and to avoid and minimise any negative impacts. It is designed to work alongside the Biodiversity Metric and is available as a beta test version.	The calculation undertaken for the Onshore Biodiversity Benefit Statement (document reference J11) utilises the latest biodiversity metric published by Defra (4.1).
November 2023	Annex 6 Natural England	This chapter does not account for impacts of ecological receptors providing habitat to supporting bird species. It is acknowledged that a specific chapter has been dedicated to impacts to onshore birds, ecological receptors assessed in this chapter play a supporting role in supporting qualifying and other significant important bird species. Therefore, the role and value that these habitats have in terms of providing supporting habitat to important bird species needs to be assessed here. The role and value that certain habitats have in terms of providing supporting habitat to important bird species needs to be assessed within the ecological chapters. This is important to consider in line with the overall function and value of these supporting habitats, especially in relation to saltmarsh, FLL habitat, and the Lytham Moss area.	Any areas of terrestrial habitat of importance for birds, including waders and waterbirds, are discussed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. This includes discussion of the presence of functionally linked land within the Onshore Order Limits and the potential for adverse effects from the loss and disturbance of this habitat.

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November 2023	Annex 6 Natural England	Natural England do not agree that the effect for coastal flood plain grazing marsh will be minor adverse. See comments regarding data above.	The assessment of impacts on priority habitats provided in **section 3.11.10**. This has been updated to reflect the current design, as well as increased survey coverage. Impacts on birds are considered in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES (document reference F3.4).
November 2023	Annex 6 Natural England	Natural England cannot agree with the conclusion that impacts on coastal sand dunes will have no effect. See comments regarding lack of surveys above.	
November 2023	Annex 6 Natural England	Natural England do not agree that the effect on coastal saltmarsh will be minor adverse. See comments regarding bird data above.	
November 2023	Annex 6 Natural England	Natural England do not agree that the effect on Lytham Moss BHS will be minor adverse. See comments regarding bird data above.	The assessment of impacts on BHSs is provided in **section 3.11.5**. This has been updated to reflect the current design, as well as increased survey coverage. Impacts on birds are considered in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES (document reference F3.4).
November 2023	Natural England	Impacts on the Natural Environment – Natural England's Key Concerns Generic Comments Natural England highlights that for several receptors, the PEIR is based on incomplete data or refers to additional data collection that is not presented or still to be carried out. Natural England cannot therefore make any conclusive judgements based on this PEIR, including the cumulative/in-combination assessments and the HRA. Accordingly, our advice focuses on the methodology used. We emphasise the need to base the submitted ES on robust datasets that meet (and where appropriate exceed) minimum standards.	Further surveys have been carried out since the publication of the PEIR, where access has been available, in order to provide a more complete baseline (see **section 3.6** of this chapter). A precautionary approach has been adopted to assess circumstances where it has not been possible to obtain. In May 2024, an EWG meeting was held, where a summary of the survey coverage for ecological receptors was provided. This included a summary of the additional surveys that had been undertaken since the

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			publication of the PEIR. Following this meeting, the Project issued a technical note to the EWG detailing survey coverage up to the ES. The Project requested for comment to be provided on the technical note. For further details on the EWG process, refer to **section 3.3.2** of this chapter.
November 2023	Lancashire County Council	I note you have consulted the historic environment record, but not the local environment record; the Lancashire Environmental Records Network should be consulted for records of all statutory and non-statutory designated sites, irreplaceable habitats, habitats of principal importance, protected and priority species that could potentially be affected by the proposed development	Records from Lancashire Environmental Record Network (LERN) were obtained in March 2024 and are included in **section 3.6.1** of this chapter.
November 2023	Lancashire County Council	As discussed below, in addition to a data search, the impact assessment should be informed by a comprehensive programme of ecological assessments.	Ecological surveys have been carried out in 2023 and 2024, the scope of surveys has been informed through consultation (through EWG meetings), review of desk study records and the results of preliminary surveys that established suitability for protected and notable species.
November 2023	Lancashire County Council	Professional competence The application to the Planning Inspectorate should include evidence that all ecological surveys, assessments and mitigation/compensation proposals have been undertaken and prepared by appropriately qualified, licenced and experienced ecologists.	Competency standards required for surveyors carrying out ecological surveys are provided in Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report. All surveyors are qualified, licensed and suitably experienced.
November 2023	Lancashire County Council	Legislation The application will need to demonstrate that the proposed development will fully comply with the requirements of all relevant legislation, including (but not limited to): • The Planning Act 2008 and associated secondary legislation;	The legislative background that has informed the assessment is provided in **section 3.2.1** of this chapter. The application of relevant legislation to the assessment of impacts on onshore ecology and nature conservation is demonstrated

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		• The Environment Act 2021 and associated secondary legislation; • Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 • The Conservation of Habitats and Species Regulations 2017; • The Wildlife and Countryside Act 1981; • The Natural Environment and Rural Communities Act 2006;	through the evaluation and identification of IEFs, as set out in **section 3.6.4**. The assessment of impacts is provided in **section 3.11**.
November 2023	Lancashire County Council	Policy The application should demonstrate that the proposed development will fully comply with the requirements of all relevant national and local planning policy, including (but not limited to): • National Policy Statements, including for example: – Overarching National Policy Statement for Energy (EN-1) – National Policy Statement for Renewable Energy Infrastructure (EN-3); – National Policy Statement for Electricity Networks Infrastructure (EN-5) • The National Planning Policy Framework (NPPF); • Local Plan policies. Section 5.3 of National Policy Statement EN-1 sets out requirements in respect of Biodiversity and geological conservation. National Policy statement EN-1 states that "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, on protected species and on habitats	The policy background that has informed the assessment is provided in **section 3.2.2** and **section 3.2.3** of this chapter. The application of relevant policy to the assessment of impacts on onshore ecology and nature conservation is demonstrated through the evaluation and identification of IEFs, as set out in **section 3.6.4**. The assessment of impacts is provided in **section 3.11**. Information on biodiversity benefit is provided in the Onshore Biodiversity Benefit Statement (document reference J11) and information on biodiversity enhancement is provided in the Outline Ecological Management Plan (document reference J6).

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		and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the IPC consider thoroughly the potential effects of a proposed project". National Policy statement EN-1 also states that "The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests". The NPPF states that planning decisions should contribute to and enhance the natural and local environment by minimising impacts on and providing net gains for biodiversity (See Paragraph 174). The NPPF also states that "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" (See Paragraph 180). In order to meet the requirements of the NPPF, the planning application will therefore need to demonstrate that: • all elements of the development would be located and designed to avoid or minimise harm to biodiversity, and • adequate mitigation/compensation for any unavoidable impacts, as well as net gains for biodiversity, will be provided.	
November 2023	Lancashire County Council	Consultees The Planning application should demonstrate that issues raised by consultees have been addressed. This includes (but is not limited to): • Natural England • The Environment Agency • Marine Management Organisation • Local Planning Authorities	Regular EWG meetings were held on the scope, methodology and findings of surveys, including those undertaken beyond the current Onshore Order Limits. Details were discussed and agreed with stakeholders via regular EWG meetings. Six ecology EWG meetings have taken place between March 2023 and June 2024. Further detail regarding consultation undertaken with respect to onshore ecology

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			can be found in the Technical Engagement Plan (document reference E6).
November 2023	Lancashire County Council	Data search The planning application should include the results of an ecological data search. This should include data from the local records centre (Lancashire Environmental Records Network). Relevant data sources include: • Lancashire Environmental Records Network (LERN) • NBN Gateway • Multi-Agency Geographical Information for the Countryside (MAGIC) • Risk Zones relating to statutory designated sites • Ancient Woodland Inventory • Centre for Ecology and Hydrology Environmental Information Data Centre • RSPB • Local recorder groups for badgers, bats, amphibians, reptiles, birds etc • Ecological data from earlier or neighbouring planning applications • Risk zones for district level licensing. It should be demonstrated that the data has informed the scope of field surveys, the design of the proposed development and mitigation/compensation measures. The data search should not be used as a substitute for field surveys. An absence of records should not be taken as absence of species or habitats. Records over 10 years old should not be discounted. These can still provide useful contextual information and an absence of more recent records may only indicate a lack of survey.	The data sources included in the desk study are identified in **section 3.5.1** and **section 3.6.1** of this chapter. Information gained from planning applications is considered in the baseline for amphibians in **section 3.6.1** and in the cumulative assessment in **section 3.13**. District level licencing is considered in the assessment of impacts on GCN in **section 3.11.12** The findings of the data search are provided in Volume 3, Annex 3.1: Onshore ecology desk study technical report.

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November 2023	Lancashire County Council	Surveys Survey data submitted with the planning application should be current/up-to-date, in line with recognised guidelines (as summarised above). The survey area should include: • The intended location of the development footprint; • Potential working areas, compounds, storage areas and access routes; • Any land that may be used within the mitigation, compensation or biodiversity net gain proposals (on or off-site); • A suitable buffer distance, taking account of the likely zone of influence and relevant survey guidelines.	Details of the survey areas are set out in **section 3.4.3**.
November 2023	Lancashire County Council	The ecological surveys/assessments should include a Preliminary Ecological Appraisal, undertaken in accordance with recognised guidelines. This should be used to determine any necessary further surveys/assessments required to inform the planning application.	A phase 1 habitat survey, including scoping for protected and notable species, was carried out as part of the PEIR and findings have contributed to determine the scope and location of species surveys. Surveys have continued since the publication of the PEIR, in areas that were not previously accessible or were originally surveyed at a suboptimal time. Findings of those surveys are reported in the ES.
November 2023	Lancashire County Council	The planning application should also include the results of more detailed phase 2 vegetation/habitat surveys of any semi-natural habitats, priority habitats and other features with the potential to support ecologically significant species. Results should include mapped plant communities and full species lists showing relative abundance. Any quadrat data and locations should be included. Any hedgerows affected by the proposals should be assessed	NVC surveys have been carried out where required, as informed by the desk study, results of the phase 1 habitat survey and predicted impacts of the Transmission Assets. Where necessary, surveys of the Fylde sand dunes have been carried out to confirm or update surveys carried out in 2016. Hedgerow surveys have been

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		according to the criteria specified in the Hedgerow Regulations 1997.	completed according to the criteria set out in the Hedgerows Regulations 1997.
November 2023	Lancashire County Council	Habitat surveys should include an assessment of the potential of habitats to support protected species, species of principal importance and other species of nature conservation significance (for example, red list species). Any evidence of such species should be recorded.	The results of the surveys are provided in Appendix 1 of Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report of the ES. The findings of habitat evaluation for protected and notable species that has taken place since the production of the PEIR are reflected in the findings of the relevant technical annexes (Volume 3, Annexes 3.4 to 3.14 of the ES).
November 2023	Lancashire County Council	A comprehensive assessment of faunal interest should also be undertaken. This should include necessary species surveys identified during the preliminary ecological appraisal. The planning application should include the results of surveys for species of nature conservation value, including: • Protected species, • Species of Principal Importance (NERC Act 2006), • Red list species, • Nationally or locally rare or scarce species.	Baseline data for protected, priority, and threatened fauna of relevance to the assessment is provided in **section 3.6** of this chapter and in the relevant technical annexes (Volume 3, Annexes 3.3 to 3.15 of the ES).
November 2023	Lancashire County Council	All surveys should be carried out at an appropriate time of year, in accordance with recognised methodologies and best practice guidelines, and be carried out by suitably competent and experienced individuals. All survey methods used should be detailed in the ES, along with any survey limitations and a rationale for any unavoidable departures from recognised survey standards.	Survey methods and competency standards required for surveyors carrying out ecological surveys are provided in Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report of the ES. Limitations relevant to different surveys are identified in the technical reports. All surveyors are qualified, licensed and suitably experienced. All surveys were undertaken in accordance with recognised

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			best practice methodologies and guidelines.
November 2023	Lancashire County Council	Evaluation An evaluation should be provided for all sites, habitats, species populations and other ecological features identified during the surveys, including identification of irreplaceable habitats. A rationale should be provided for the evaluation given to each ecological feature.	An evaluation of important ecological features considered in the assessment is provided in **Table 3.17** in **section 3.6.4** of this chapter.
November 2023	Lancashire County Council	Avoidance of ecological impacts It needs to be demonstrated that measures have been taken to avoid detrimental impacts on sites, habitats, species and features of ecological value, including (but not limited to): • Statutory designated sites and functionally linked land • Non-statutory designated sites • Habitats of Principal Importance • Irreplaceable habitats • Protected species and their habitats • Species of principal importance and their habitats • Other notable species and their habitats (for example, red list species) • Habitat connectivity.	Where possible, designated sites, habitats, species and other features of ecological value have been avoided through the route selection process and through the use of direct pipe installation or other trenchless techniques. Unavoidable impacts that cannot be addressed through these approaches are subject to other forms of mitigation, or compensation as described in **section 3.8.** Volume 1, Chapter 4: Site selection and consideration of alternatives demonstrates how onshore ecology and nature conservation constraints were considered in establishing the Onshore Order Limits, alongside evaluation of a range of a range of other environmental considerations
November 2023	Lancashire County Council	The NPPF states that development resulting in the loss or deterioration of irreplaceable habitats should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists. Irreplaceable habitats include habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, for example ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and	Irreplaceable habitats are now confirmed by The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. Of these, coastal sand dunes, ancient woodland and ancient and veteran trees are potentially relevant to onshore ecology and nature conservation for the

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		lowland fen. A definition and definitive list are expected to be published in the near future	Transmission Assets. Assessment of impacts is provided in **section 3.11**.
November 2023	Lancashire County Council	Irreplaceable habitats should be identified and it should be demonstrated that detrimental impacts on such habitats will be avoided. If the development would have a detrimental impact on any irreplaceable habitat, then the planning submission will need to include a robust statement of alternatives explored to avoid the loss of irreplaceable habitats and why they were not feasible.	Measures to avoid loss of irreplaceable habitat have been adopted through the route selection process. The iterative design process has avoided many impacts, for example direct pipe installation of offshore export cables beneath the Lytham St Annes Dunes SSSI, and Lytham Foreshore Dunes and Saltmarsh BHS. Further information is provided in **section 3.8**, with impacts assessed in **section 3.11**. Volume 1, Chapter 4: Site selection and consideration of alternatives demonstrates how onshore ecology and nature conservation constraints were considered in establishing the Onshore Order Limits, alongside evaluation of a range of a range of other environmental considerations.
November 2023	Lancashire County Council	Statutory Designated Sites The planning application should address the possibility of impacts on statutory designated sites, taking account of impact risk zones. Natural England should be consulted if there may be impacts on a statutory designated site. The planning application should include sufficient information to address the requirements of the Habitats Regulations (See Planning Inspectorate Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects).	Impacts on statutory designated sites have been assessed and mitigation is provided for any unavoidable impacts, as described in **section 3.8** and as assessed in **sections 3.11.2** and **3.11.4** of this chapter. Information to address the requirements of the Habitats Regulations is provided in ISAA (document references E2.1, 2.2, 2.3), to which this chapter refers where necessary.
November 2023	Lancashire County Council	Non-Statutory Designated Sites The NPPF states that planning decisions should contribute to and enhance the natural and local environment by protecting and	Impacts on non-statutory designated sites have been assessed and mitigation is provided for any unavoidable impacts, as

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		enhancing sites of biodiversity value (Paragraph 174). The planning application should address likely direct or indirect impacts on Biological Heritage Sites or other non-statutory designated sites. Impingement onto Biological Heritage Sites should be avoided and it should be demonstrated how impacts on Biological Heritage Sites will be avoided during and after the proposed development. If it can be demonstrated that impacts on designated sites are unavoidable, then the planning application should demonstrate that there will be adequate mitigation/compensation measures to provide an overall net gain in biodiversity value. Mitigation/compensation proposals should be informed by a comprehensive ecological survey of the areas affected, with reference to the qualifying features of each site.	described in **section 3.8** and assessed in **section 3.11** of this chapter.
November 2023	Lancashire County Council	Protected Species Potential impacts on protected species will need to be fully assessed prior to determination of the application. This should be informed by a desk study, an assessment of habitat suitability and a comprehensive programme of species surveys, including (but not restricted to) consideration of the following species: • great crested newts; • bats; • otters; • water vole; • badgers; • reptiles; and • breeding birds.	Impacts on protected species have been assessed and mitigation is provided for any unavoidable impacts, as described in **section 3.8** and assessed in **section 3.11** of this chapter.
November 2023	Lancashire County Council	DEFRA Circular 01/2005 (ODPM Circular 06/2005), referenced in Footnote 61 of NPPF 2021, states that “It is essential that the	Surveys have been carried out in 2022, 2023 and 2024 in order to confirm the

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted" and that "the survey should be completed and any necessary measures to protect the species should be in place, through conditions and/or planning obligations, before the permission is granted" (Paragraph 99). The planning application therefore needs to include habitat assessments and survey data for all protected species that could potentially be present and affected by the proposals. The survey methods used should be detailed in the planning submission. These should comply with recognised guidelines. The planning application should demonstrate that relevant species protection legislation will be adhered to and should include mitigation/compensation proposals for unavoidable impacts on such species and their habitats. If any European protected species (such as bats, great crested newt or otters) are present, then the planning application should include measures to avoid any breach of The Habitats Regulations. If such a breach would be unavoidable, then a Natural England Licence would be required before development work could commence. The Conservation of Habitats and Species Regulations 2017 state that a competent authority, in exercising any of its functions, must have regard to the requirements of the Directives. The application will therefore need to include sufficient information to enable the determining authority to meet this requirement.	presence or indicate the likely absence of protected species. A precautionary approach to baseline characterisation, impact prediction and mitigation has been taken in situations where it has not been possible to complete surveys. The Applicants will apply for mitigation licenses if there are unavoidable impacts on fully protected species, with the information necessary to allow the application to be determined.
November 2023	Lancashire County Council	Other species The planning application will need to include an assessment of likely impacts on species of nature conservation value and	Likely impacts on species of nature conservation value and mitigation/compensation measures for

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		mitigation/compensation measures for unavoidable impacts. This should include Species of Principal Importance (NERC Act 2006), red list species and any nationally or locally rare or scarce species.	unavoidable impacts have been considered and the assessment is provided in **section 3.11** of this chapter.
November 2023	Lancashire County Council	Invasive/Injurious Weeds Surveys for invasive or injurious weeds should be carried out. If such species are present the planning application should demonstrate how the spread of these species will be avoided during the proposed development works and how the species will be eradicated from the site. This should follow recognised guidelines	Surveys of INNS have been carried out and they are considered in **section 3.11** of this chapter. The risk of introducing or spreading INNS will be avoided and controlled through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies the application for development consent.
November 2023	Lancashire County Council	Impact Assessment Unavoidable impacts on sites, habitats, species and features of ecological value will need to be assessed in accordance with recognised guidelines (see examples above). All temporary and permanent impacts should be stated and assessed, including (but not limited to): • habitat loss, • habitat degradation and disturbance, • habitat fragmentation, severance and isolation, • ecological impacts arising from hydrological changes, • potential killing, injury and disturbance of protected and priority species, • destruction or disturbance of habitats used by protected and priority species, • impacts arising from lighting, noise, vibration, dust etc.	The scope of impacts considered in **section 3.11** of this chapter has been established through consultation with the EWG and through review of consultation responses.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		• Impacts of all construction and related works should be included in the assessment, including the construction footprint, compounds, storage areas, access routes etc. The area and biodiversity value of each habitat type that would be lost, damaged, re-established, enhanced or brought into favourable management should be quantified in order to illustrate that the impacts of the development will be fully off-set and that overall biodiversity gains will be delivered. The current DEFRA biodiversity metric should be used.	
November 2023	National Infrastructure Team Environment Agency	Biodiversity Net Gain (BNG): Further clarification is required regarding the approach to BNG. It's unclear at this time how this will be implemented. We would urge the applicant to engage with the developing Local Nature Recovery Strategy (LNR) to explore BNG options that could align with the LNR strategic approach (further comments in Appendix C).	The status of the Local Nature Recovery Strategy for Lancashire is summarised in **section 3.6**. Step 1 of the strategy, to map areas of particular importance for biodiversity, is complete. Accordingly, **section 3.11** of the chapter includes assessment of areas of particular importance such as statutory and non-statutory designated sites. Information on biodiversity benefit is provided in the Onshore Biodiversity Benefit Statement (document reference J11) and information on biodiversity enhancement is provided in the Outline Ecological Management Plan (document reference J6).
November 2023	National Infrastructure Team Environment Agency	Ecological surveys: A number of further ecology surveys are required to ensure suitable baseline assessment of protected habitats and species especially in respect to CRoW assessments for onshore SSSIs, and water voles.	Surveys have been carried out in 2022, 2023 and 2024 in order to confirm the presence or indicate the likely absence of protected species. This has informed the assessments set out in **section 3.11** of this chapter. This includes details of the effects on SSSIs and other designated sites. No effects on water voles are considered likely.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
November 2023	National Infrastructure Team Environment Agency	Lack of clarity regarding the works in the area of the sand dunes SSSI. Impact	Direct pipe trenchless installation is proposed beneath the sand dunes. This technology will ensure there is no open trenching through the dunes. This will avoid any direct loss of vegetation and habitats. Instead, the drill will pass beneath the dunes at depth. Where necessary consideration of any indirect effects on the habitat and measures to avoid, minimise or mitigate these is provided in **section 3.11**. Crossing techniques are set out within Volume 1, Annex 3.2: Onshore Crossing Schedule of the ES (document reference F1.3.2) which is submitted as part of the application for development consent.
November 2023	National Infrastructure Team Environment Agency	At this time the site does not have a suitable BNG strategy. Impact The proposals do not accord with government policy. There is the potential for missed opportunities for environmental gains from this project. In addition, the delivery of BNG has not been incorporated into the application and implications of this activity have not been assessed.	As set out in the Onshore Biodiversity Benefit Statement (document reference J11), the Transmission Assets are not subject to a mandatory net gain requirement under the Environment Act 2021. Nevertheless, the Applicants have worked with statutory consultees to discuss the approach, and to develop the design, to allow the maximum benefit to biodiversity within the parameters of the project. For the Transmission Assets, biodiversity benefit will be delivered within identified biodiversity benefit areas within the Transmission Assets Order Limits: Onshore (referred to as the Onshore Order Limits).

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			Further details of the approach to biodiversity benefit are provided in the Onshore Biodiversity Benefit Statement (document reference J11). The calculation undertaken for the Onshore Biodiversity Benefit Statement (document reference J11) utilises the latest biodiversity metric published by Defra (4.1). The status of the Local Nature Recovery Strategy for Lancashire is summarised in **section 3.6**. Step 1 of the strategy, to map areas of particular importance for biodiversity, is complete. Accordingly, **section 3.11** of the chapter includes assessment of areas of particular importance such as statutory and non-statutory designated sites.
November 2023	National Infrastructure Team Environment Agency	The following comments on the assessment approach were received from the Environment Agency: Lack of CRoW assessment means that potential impacts of • HDD under Lytham St Annes sand dunes SSSI has not been adequately assessed • HDD under Ribble Estuary SSSI has not been adequately assessed The impacts on saltmarsh are considered low magnitude and of minor significance	Direct pipe trenchless installation is proposed beneath the sand dunes (including Lytham St Annes Dunes SSSI). This technology will ensure there is no open trenching through the dunes. This will avoid any direct loss of vegetation and habitats. Instead, the drill will pass beneath the dunes at depth. Direct pipe or microtunnelling is proposed beneath the River Ribble to ensure that there would be no direct impacts on the river habitats. The risk of bentonite breakout will be controlled through the bentonite breakout plan. An Outline Bentonite Breakout Plan (document reference J1.13) is provided as an annex to

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			the Outline Code of Construction Practice (CoCP) (document reference J1). This includes consideration of disturbance. Where necessary consideration of any indirect effects on the habitat and measures to avoid, minimise or mitigate these is provided in **section 3.11**. This includes consideration of disturbance. Crossing techniques are set out within Volume 1, Annex 3.2: Onshore Crossing Schedule of the ES (document reference F1.3.2) which is submitted as part of the application for development consent. The assessment of impacts on priority habitats provided in **section 3.11.10**. This has been updated to reflect the current design, as well as increased survey coverage. No impacts on saltmarsh habitat are anticipated.
November 2023	National Infrastructure Team Environment Agency	Water vole baseline is insufficient. Water vole survey was not carried out in accordance with best practice protocol. Only one survey was undertaken, and the dry spring of 2023 meant survey results were impacted with signs of water voles being more limited in this period – as was highlighted in the survey report.	Surveys have provided scattered and unconfirmed evidence of water vole, predominantly in the form of mammal burrows. There is infrequent but widespread evidence of mink *Neogale vison*, which is a significant predator of water vole, in and near the survey area. Findings of the surveys are set out in Volume 3, Annex 3.9: Water vole technical report of the ES. Water vole surveys have been carried out with the understanding that the Ribble Estuary SSSI and NNR is considered to be

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			a stronghold for water vole, and all accessible areas in and in the vicinity of the SSSI and NNR were surveyed to establish the current status of the population. Survey data indicates that the population has declined, potentially due to the presence of mink, as there is very little confirmed evidence of water vole. The feeding remains and a nearby unconfirmed burrow near Penwortham indicate the transient presence of water vole rather than an established population. Water vole are therefore considered to be of local importance and have not been taken forward as an important ecological feature for assessment.
November 2023	National Infrastructure Team Environment Agency	The scope of ecological assessment is insufficient. Further assessment of the ordinary watercourses and other water features will need to be considered.	**Section 3.11** provides an assessment of effects for all important ecological features taken forward to assessment, including watercourses and species they support (such as fish). See comment above re water voles specifically.
November 2023	National Infrastructure Team Environment Agency	There remains a risk that wildlife may become entrapped in site fencing.	Measures to protect wildlife during construction are set out in the Outline Code of Construction Practice (document reference J1). This includes an Outline Construction Fencing Plan (document reference J1.10).
November 2023	National Infrastructure Team Environment Agency	A number of comments requesting that commitments remain in place and are secured through the DCO.	**Section 3.8** confirms the commitments in place and sets out the mechanism by which these will be secured.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
November 2023	Canal and River Trust	Ecology Savick Bridge Biological Heritage Site contains the Long-stalked orache (which is nationally scarce). The area would benefit from biodiversity enhancement. In terms of the Lea Marsh Biological Heritage Site this is also noted as containing the Long-stalked orache. Otters are also known to frequent the eastern side of the site. We would be happy to discuss further with the promoter the potential for biodiversity enhancement along our waterways.	The effects on Biological Heritage Sites (including Savick Brook) are set out in **section 3.11.5**. Wider ecological enhancement measures are set out within the Outline Ecological Management Plan (document reference J6). The Applicants are committed to engaging with stakeholders to deliver further qualitative benefits to biodiversity.
November 2023	Northwest Wildlife Trust	Whilst we recognise that Biodiversity Net Gain policies and delivery frameworks are more developed for terrestrial and intertidal habitats than they are for the marine environment, we would still expect Morgan and Morecambe OWF to aim to achieve an overall net positive impact on biodiversity and ecology in the marine environment.	The Applicants note your response. The approach to biodiversity benefit is provided in the Onshore Biodiversity Benefit Statement (document reference J11). Information regarding ecological enhancement can be found in the Marine Enhancement Statement (document reference J12).
November 2023	Northwest Wildlife Trust	Onshore ecology and nature conservation Fylde Sand Dunes – As stated above, one of our principal concerns is the impact on the dune system, should it prove impossible to deploy HDD/trenchless technology (results of geological investigations awaited).	Direct pipe trenchless installation is proposed beneath the sand dunes. This technology will ensure there is no open trenching through the dunes. This will avoid any direct loss of vegetation and habitats. Instead, the drill will pass beneath the dunes at depth. Where necessary consideration of any indirect effects on the habitat and measures to avoid, minimise or mitigate these is provided in **section 3.11.4**.
November 2023	Northwest Wildlife Trust	Ribble Estuary/Coastal Saltmarsh – Again, we would wish to see HDD employed (CoT90). You also need to be aware of a number of existing projects (Our Future Coast), or projects under development, involving saltmarsh restoration and managed	Direct pipe or microtunnelling is proposed beneath the River Ribble to ensure that there would be no direct impacts on the river habitats. The risk of bentonite

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
		realignment on the Ribble. There is already some overlap between some of these projects and the identified 400Kv cable corridor search and the identified potential BNG, enhancement and /or mitigation areas.	breakout will be controlled through the bentonite breakout plan. An Outline Bentonite Breakout Plan (document reference J1.13) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1). This includes consideration of disturbance. Crossing techniques are set out within Volume 1, Annex 3.2: Onshore Crossing Schedule of the ES (document reference F1.3.2) which is submitted as part of the application for development consent.
November 2023	Northwest Wildlife Trust	Sand Lizards – There is no mention of sand lizards in the PEIR. Following a reintroduction programme, they are found throughout the dune system within the Coastal Survey Area (2023 heat map attached – please treat as confidential). They are also found on the LNR (inland dune system). We would urge the Developer to engage with Dunes Project staff over sand lizards and impacts on the dunes and Project more widely.	Sand Lizards – There is no mention of sand lizards in the PEIR. Following a reintroduction programme, they are found throughout the dune system within the Coastal Survey Area (2023 heat map attached – please treat as confidential). They are also found on the LNR (inland dune system). We would urge the Developer to engage with Dunes Project staff over sand lizards and impacts on the dunes and Project more widely.
November 2023	Northwest Wildlife Trust	3. BNG, enhancement and mitigation land areas for the Project We have not had time to review the indicative onshore route(s) in detail but we would strongly suggest the use of opportunity mapping to see how the Project could contribute to Lancashire's Local Nature Recovery Strategy (link to interactive map here) as well as bigger initiatives such as Nature North's Green Northern Connections.	The status of the Local Nature Recovery Strategy for Lancashire is summarised in **section 3.6**. Step 1 of the strategy, to map areas of particular importance for biodiversity, is complete. Accordingly, **section 3.11** of the chapter includes assessment of areas of particular importance such as statutory and non-statutory designated sites.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			Information on biodiversity benefit is provided in the Onshore Biodiversity Benefit Statement (document reference J11) and information on biodiversity enhancement is provided in the Outline Ecological Management Plan (document reference J6).
December 2023	EWG	In response to requests at the previous EWG held in September 2023 and in statutory consultation feedback, this EWG provided further detail on trenchless techniques. Queries were raised by Environment Agency representatives regarding minimum depth for trenchless techniques under main rivers, and highlighted that further studies on a site by site basis should be undertaken to determine depths, geologies and potential for contaminated ground. The opportunities for potential collaboration with ongoing and planned enhancement and mitigation schemes were outlined. Attendees were invited to send further suggestions. It also provided further detail on the application of biodiversity benefit for the Transmission Assets (including, policy, principles, approach, preliminary assessment results and initial findings). Initial feedback was received regarding impacts of works associated with trenchless techniques, and the treatment of irreplaceable habitats. Attendees were invited to send further comments and feedback on the proposed approach to biodiversity benefit. More detail was provided in the subsequent technical note. This note included key considerations for the delivery of biodiversity benefit for the Transmission Assets and the Applicants' proposed approach to biodiversity benefit.	Further details on the trenchless techniques proposed as part of the Transmission Assets are provided in Volume 1, Chapter 3: Project description of the ES. The MDS (**Table 3.21**) sets out the parameters for trenchless techniques taken forward to the assessment (**section 3.11**). CoT10 (see Volume 1, Annex 5.3: Commitments register of the ES) reflects the comments raised by the Environment Agency around minimum depths for trenchless techniques under main rivers and sets out that cable burial depth will be ascertained post-consent during detailed design stage, in order to ensure cables remain buried during the development lifetime. Details regarding biodiversity benefit are set out in the Onshore Biodiversity Benefit Statement (document reference J11), including the approach to biodiversity benefit and the biodiversity benefit calculation results.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
January 2024	EWG	Presentation of statutory consultation key comments and approach to addressing comments in ES. Update on baseline surveys undertaken to date and baseline data proposed to be included in the ES.	A description of the methodologies used for the ecology surveys are provided in **section 3.5**, and a summary of the survey results is located in **Table 3.14** and **Table 3.15**. More detailed methodologies and results can be found within the annexes to this chapter.
February 2024	EWG (Natural England)	Provided suggested schemes for consideration regarding collaboration around biodiversity enhancement.	The Applicants are committed to exploring opportunities for enhancement with relevant stakeholders, and the provided schemes have formed a basis for discussion. Further details regarding enhancement are provided in the Outline Ecological Management Plan (document reference J6).
February 2024	EWG (Environment Agency)	Provided suggested schemes for consideration regarding collaboration around biodiversity enhancement.	The Applicants are committed to exploring opportunities for enhancement with relevant stakeholders, and a provided schemes have formed the basis for discussion. Further details regarding enhancement are provided in the Outline Ecological Management Plan (document reference J6).
May 2024	EWG	Discussed the anticipated survey coverage of all ecology survey types for the ES. Comments were raised regarding the water vole surveys by the Environment Agency. The Project issued a technical note on survey coverage.	No further comments have been raised in response to the technical note on survey coverage or updated survey methodologies. A description of the methodologies used for the ecology surveys are provided in **section 3.5**, and a summary of the survey results is located in **Table 3.14** and **Table 3.15**. More detailed methodologies and

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			results can be found within the annexes to this chapter.
June 2024	EWG	Discussion of the approach to mitigation and biodiversity benefit for the Transmission Assets. Proposed mitigation areas (and suggested management and monitoring measures at these areas) were presented to the EWG alongside how there were to be used to reduce the impacts upon IEFs. Comments were raised around the approach to pond mitigation. Additionally, proposed biodiversity benefit areas were presented to the EWG alongside proposed management measures and indicative planting strategies. Comments were raised around the consideration of agricultural productivity as part of the biodiversity benefit strategy.	Commitments relevant to onshore ecology and nature conservation are set out in **Table 3.20**, which include proposed mitigation areas as part of the Ecological Management Plan(s) (CoT76). Details regarding biodiversity benefit are set out in the Onshore Biodiversity Benefit Statement (document reference J11), including the proposed habitat creation measures. An assessment of the impact of the Transmission Assets on agricultural land use is set out in Volume 3, Chapter 6: Land use and recreation of the ES.

3.4 Study area

3.4.1.1 In this chapter, there are two specific terms used to identify areas used for baseline data collection, these are:

- the onshore ecology study area; and
- the onshore ecology survey area.

3.4.2 Study area

3.4.2.1 The onshore ecology study area used for the desk study (Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES) covers the Transmission Assts Order Limits: Onshore (referred to as the Onshore Order Limit)s, plus a buffer that varies depending on the ecological resource. The study area covers:

- a buffer of 20 km around the Onshore Order Limits for internationally statutory designated sites;
- a buffer of 10 km around the Onshore Order Limits for nationally statutory designated sites;
- a buffer of 2 km around the Onshore Order Limits for ancient woodland, locally designated sites, ecological networks, records of priority habitats and records of protected or notable species (excluding plants and invertebrates);
- a buffer of 1 km around the Onshore Order Limits for records of protected or notable plants, invertebrates and aquatic invertebrates; and
- a buffer of 100 m around the Onshore Order Limits for records of ancient, veteran and notable trees.

3.4.2.2 The onshore ecology study area is shown in Figure 3.1 (see Volume 3, Figures).

3.4.3 Survey area

3.4.3.1 The onshore ecology survey area (‘the survey area’) focuses on ecological receptors landward of MHWS where potential impacts on onshore ecological receptors are most likely to occur.

3.4.3.2 The onshore ecology survey area is the area used for site-specific surveys and is, in most cases, defined as a 150 m buffer around the Onshore Order Limits. The 150 m buffer has been included to allow for disturbance to IEFs that may occur outside of the Onshore Order limits but that are adjacent or close to the Onshore Order Limits.

3.4.3.3 It is noted that separate survey areas were used for badger surveys, for which a 30 m buffer around the Onshore Order Limits was used.

3.4.3.4 Due to the iterative design process during evolution of the design of the Transmission Assets, some earlier surveys were undertaken outside of the onshore ecology survey area (more than 150 m from the Onshore Order

Limits). Information gained from these surveys has been taken into account in providing context regarding the ecological sensitivity of the wider area.

3.4.3.5 The onshore ecology survey area is shown in Figure 3.2 (see Volume 3, Figures).

3.5 Baseline methodology

3.5.1 Methodology for baseline studies

Desk studies

3.5.1.1 Information on ecological receptors within the onshore ecology study area was collected through a detailed desktop review of existing studies and datasets from LERN, MAGIC and the Joint Nature Conservation Committee (JNCC).

3.5.1.2 The desk study was undertaken in March 2024. The existing studies and datasets referred to as part of the desk study are summarised in **Table 3.6** below.

Table 3.6: Summary of desk study sources

Title	Source	Year	Author	Notes
LERN	LERN data share site	2024	LERN	Records for protected and notable species, non-statutory wildlife sites and ecological networks.
MAGIC	Defra	2024	Defra	Statutory sites, priority habitats. SSSI impact risk zones.
Designated Sites View	MAGIC	2024	Natural England	SSSI citations, interest features, condition and impact risk zones.
UK Protected Areas JNCC	JNCC website	2024	JNCC	Reasons for designation of constituents of the National Sites Network.
The Woodland Trusts	The Woodland Trust Ancient Tree Inventory Website	July 2024	The Woodland Trust	Ancient, veteran and notable trees within 100 m of the Onshore Order Limits.
Ecology and fish data explorer	Environment Agency	2024	Environment Agency	Fish data for the Ribble Estuary.
Red List	JNCC taxon designations	2023	International Union for the Conservation of Nature (IUCN)	Formal conservation status of species.
A review of ecological change in relation to management interventions undertaken on the Fylde Sand Dunes Project, Lancashire	Lancashire Wildlife Trust and Our Future Coast	2024 (final report)	Graeme Skelcher Ecological Consultant	Contains earlier data including a detailed NVC survey from 2016, as well as details of sand lizards, on which this chapter relies.

Title	Source	Year	Author	Notes
Aerial imagery	Google earth Google maps Streetview	2023		For initial scoping, and gap filling for the Phase 1 habitat survey for which earlier data was also used where necessary to confirm current habitat types.
Fylde District Council	Email request to planning department	July 2024	Fylde District Council	Location and extent of Semi-natural Green Spaces as defined in the Local Plan.
Preston City District Council	Email request to planning department	July 2024	Preston City District Council	Location and extent of Wildlife Corridors, Green Infrastructure and Existing Woodland as defined in the Local Plan.
South Ribble District Council	Email request to planning department	July 2024	South Ribble District Council	Location and extent of as Wildlife corridors and Green Infrastructure as defined in the Local Plan.

3.5.1.3 The detailed methodology for the desk study can be found in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

Site-specific surveys

3.5.1.4 In order to inform the ES, site-specific surveys have been undertaken. Phase 1 habitat surveys were undertaken throughout the survey area, where access permitted, between May 2022 and May 2024 to map all habitats present and to identify any potential for protected species to be present. Data from phase 1 habitat surveys up to May 2024 has been assessed in the ES. The area of Phase 1 habitat surveys completed and reported in the ES is set out in Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report.

3.5.1.5 Surveys have been carried out for badger, bats, otter, water vole, GCN, reptiles, fish, aquatic and terrestrial invertebrates, river morphology and INNS. Results from these surveys up to August 2024 have been included in the ES. Surveys for white clawed crayfish *Austropotamobius pallipes* were carried out for the PEIR and no suitable habitat was identified. This remains the case following further Phase 1 habitat survey undertaken since the PEIR and consequently no further surveys have been carried out the ES. The scope and content of survey methodologies were discussed and agreed with relevant stakeholders as part of the EWG process. Further information with regard to surveys for white clawed crayfish and subsequent findings are presented in Volume 3, Annex 3.15: White clawed crayfish survey technical report of the ES.

3.5.1.6 More details regarding survey methodologies, including surveys scoped out, are set out in Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report of the ES.

3.5.1.7 For the purpose of the ES, a precautionary approach of assumed presence has been taken for any habitats within the survey area that were assessed as having potential to support protected or notable species but have not subsequently been accessible for survey.

3.5.1.8 Detailed methodologies for each of the site-specific surveys are presented in each of the following technical annexes:

- Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report of the ES;
- Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report of the ES;
- Volume 3, Annex 3.4: River morphology survey technical report of the ES;
- Volume 3, Annex 3.5: Aquatic invertebrate survey technical report of the ES;
- Volume 3, Annex 3.6: Terrestrial invertebrate survey technical report of the ES
- Volume 3, Annex 3.7: Fish and eel survey technical report
- Volume 3, Annex 3.8: Great crested newt and reptile survey technical report;
- Volume 3, Annex 3.9: Water vole survey technical report of the ES;
- Volume 3, Annex 3.10: Bat activity survey technical report of the ES;
- Volume 3, Annex 3.11: Bat roost survey technical report of the ES;
- Volume 3, Annex 3.12: Otter survey technical report of the ES;
- Volume 3, Annex 3.13: Badger survey technical report of the ES;
- Volume 3, Annex 3.14: Invasive non-native species technical report of the ES; and
- Volume 3, Annex 3.15: White-clawed crayfish survey technical report of the ES.

3.5.1.9 Site-specific survey methodologies, including how these have considered feedback provided by Natural England in September 2023, are set out within Volume 3, Annex 3.2: Onshore ecology survey methodologies technical report of the ES**.**

3.6 Baseline environment

3.6.1 Desk study

3.6.1.1 Information on ecology within the onshore ecology study area was collected through a detailed review of existing studies and datasets. An analysis of ecological records, identified from a review of available data is detailed in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES. The key desk study data sources are summarised in **Table 3.6** above.

Designated sites

3.6.1.2 The desk study identified nine international statutory designated sites within the 20 km buffer around the Onshore Order Limits, as described in Annex

3.1: Onshore ecology desk study technical report of the ES and shown in Figure 3.3 (see Volume 3, Figures). Of those nine sites, three are relevant to onshore ecology and nature conservation. Information on those relevant to onshore ecology and nature conservation is provided in **Table 3.7** below, and information on those for which birds are a reason for designation is provided in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. Information on internationally designated sites associated with the offshore marine and benthic environments is provided in:

- Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES;
- Volume 2, Chapter 3: Fish and shellfish ecology of the ES;
- Volume 2, Chapter 4: Marine mammals of the ES; and
- Volume 2, Chapter 5: Offshore ornithology of the ES.

3.6.1.3 An assessment of impacts on sites of international importance is provided in the ISAA report (document references E2.1, 2.2, 2.3), to which this chapter refers where relevant.

3.6.1.4 The location and geographic extent of internationally designated sites within 20 km of the Onshore Order Limits are presented in Figure 3.3 (see Volume 3, Figures).

Table 3.7: International designated sites and relevant qualifying interests within the study area

Site name	Designation	Distance (km)	Description	Where considered in this chapter
Ribble and Alt Estuaries	SPA, Ramsar site	Partly within the Onshore Order Limits	The coastal habitats of this SPA and Ramsar site support many nesting and migrating birds. The specific designation of this site relates to the presence of an internationally important waterbird and seabird assemblage alongside several breeding and non-breeding bird species in Annex I of the Wild Birds Directive (Article 4.1). The Ramsar site is also designated for supporting up to 40% of the Great Britain population of natterjack toad *Bufo calamita*. A baseline characterisation of this SPA and Ramsar site relevant to the ornithological features can be found in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.	**Section 3.11.3**.
The Sefton Coast	SAC	8.63	The Sefton Coast is designated as an SAC due to the following habitats listed in Annex 1 of the Habitats Directive (Article 4.1):	Not considered further. No impacts on this designated site are considered

Site name	Designation	Distance (km)	Description	Where considered in this chapter
			• embryonic shifting dunes (one of the best examples of this habitat in the UK); • shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes'); • fixed coastal dunes with herbaceous vegetation ('grey dunes') (a priority feature); • dunes with *Salix repens ssp. argentea* (*Salicion arenariae);* and • humid dune slacks. The following Annex 1 habitat is listed as a qualifying feature but not a primary reason for designation. • Atlantic decalcified fixed dunes *Calluno-Ulicetea* (a priority feature). The site is also designated for petalwort *Petalophyllum ralfsii* as a primary reason for designation, and for GCN, with both species listed in Annex II of the Habitats Directive (Article 4.1).	likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS (**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.
Morecambe Bay	SAC	15.48	The qualifying features of this SAC are the following habitat listed in Annex 1 of the Habitats Directive (Article 4.1): • estuaries; • mudflats and sandflats not covered by seawater at low tide; • large shallow inlets and bays; • perennial vegetation of stony banks; • *Salicornia* and other annuals colonizing mud and sand; • Atlantic salt meadows *(Glauco-Puccinellietalia maritimae*); • shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes'); • fixed coastal dunes with herbaceous vegetation ('grey dunes'); and • humid dune slacks.	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS (**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.

Site name	Designation	Distance (km)	Description	Where considered in this chapter
			The site is also designated for GCN which is listed in Annex II of the Habitats Directive (Article 4.1). The following Annex 1 habitats are present as qualifying features but not primary reasons for designation: • sandbanks which are slightly covered by sea water all the time; • coastal lagoons (a priority feature); • reefs; • embryonic shifting dunes; • Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) (a priority feature); and • dunes with *Salix repens* ssp. *Argentea* (*Salix arenariae*).	

3.6.1.5 Impacts on internationally designated sites are considered in **section 3.11.3. Section 3.6.4** identifies the IEFs taken forward for assessment.

3.6.1.6 The desk study identified 12 nationally designated sites located within 10 km of the Onshore Order Limits. The name, designation, distance, and description of these sites is provided in **Table 3.8** below. The location and geographic extent of nationally designated sites within 10 km of the Onshore Order Limits is presented in Figure 3.4 (Volume 3, Figures). Information on internationally designated sites associated with the offshore marine and benthic environments is provided in:

- Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES;
- Volume 2, Chapter 3: Fish and shellfish ecology of the ES;
- Volume 2, Chapter 4: Marine mammals of the ES; and
- Volume 2, Chapter 5: Offshore ornithology of the ES.

Table 3.8: Nationally designated sites within the onshore ecology study area[1]

Site name	Designation	Distance (km)	Description	Where considered in the ES
Lytham St Annes Dunes	SSSI	Partly within Onshore Order Limits.	This site is of special scientific interest as it is what remains of the once extensive sand dune system along the Fylde Coast. The dunes show classic features of dune formation and succession including foredune, yellow dune, dune grassland, acid dune grassland, dune scrub, and dune slacks. The dune grassland and dune slacks in particular are herb rich with variations depending on soil characteristics and the degree of moisture retention. The dunes support over 230 species of higher plants, including rare species such as dune fescue *Vulpia fasciculata*, dune helleborine *Epipactis dunensis,* seaside centaury *Centaurium littorale,* variegated horsetail *Equisetum variegatum,* round-leaved wintergreen *Pyrola rotundifolia,* and locally scarce species such as common broomrape *Orobanche minor*, Danish scurvy-grass *Cochlearia danica*, blue fleabane *Erigeron acer*, bee orchid *Ophrys apifera* and pyramidal orchid *Anacamptis pyramidalis.* Over 150 species of butterfly and moth have been recorded, including nationally important species, dark tussock moth *Dicailomera fascelina* and the Portland moth *Ochropleura praecox.* The sandhill rustic moth *Luperina nickerlii gueneei* has been recently rediscovered in the area after it was thought to be locally extinct. The features of the SSSI are: • populations of the following nationally scarce or declining plant species and those at the edge their range: knotted pearlwort *Sagina nodosa*, dune fescue, small-fruited	**Section 3.11.4**.

[1] The condition of features forming the reason for designation of SSSI is derived from Natural England's Standard SSSI Monitoring. Condition categories are intended to establish whether or not features are in favourable condition or moving towards it, usually as a result of ongoing management and monitoring. The categories are: favourable unfavourable recovering, unfavourable no-change, unfavourable declining, part destroyed, destroyed. Unfavourable condition does not reduce its importance of an SSSI, but consideration of current condition and its causes aids an understanding of its sensitivity and vulnerability to impacts.

Site name	Designation	Distance (km)	Description	Where considered in the ES
			yellow sedge *Carex oederi*, sea holly *Eryngium maritimum,* yellow bartsia *Parentucellia viscosa* and common broomrape (condition not recorded); • fixed dune grassland (unfavourable recovering condition); • humid dune slacks (unfavourable recovering condition); • invertebrate assemblage f111 bare sand and chalk (favourable condition); • invertebrate assemblage f112 open short sward (unfavourable no change condition); • sand dune; strandline, embryo and mobile dunes (sd1-6) (unfavourable recovering condition); and • vascular plant assemblage (unfavourable recovering condition).	
Ribble Estuary	SSSI	Partly within the Onshore Order Limits.	This site provides important sand and mudflats habitat for invertebrates, as well as saltmarsh habitat which provides nursery grounds for a variety of fish. The site is part of a chain of estuaries along the west coast of Britain and is therefore an important migratory route for birds travelling from their breeding grounds in the far north to their wintering grounds further south. The vast numbers of wildfowl and waders at this site is of international importance. The site is also a stronghold for water vole *Arvicola amphibius*. A baseline characterisation of the ornithology importance of this designated site can be found in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The interest features of the SSSI relevant to onshore ecology and nature conservation are: • lowland neutral grassland (MG5); and • SM4-28 – Saltmarsh. Both are in favourable condition.	**Section 3.11.3.**
Ribble Estuary	MCZ	Partly within Onshore Order Limits	The site is designated for its population of smelt *Osmerus eperlanus*, a species of principal importance for conservation in England under Section 41 of the Natural Environment and Rural Communities Act (2006). See also	Volume 2, Chapter 3: Fish and shellfish ecology of the ES.

Site name	Designation	Distance (km)	Description	Where considered in the ES
			Ribble Estuary SSSI (above). As such, this site does not have qualifying features relevant to onshore ecology and nature conservation, and is not considered further in this chapter.	
Ribble Estuary	NNR	0.68	The Ribble Estuary NNR falls wholly within the Ribble Estuary SSSI and is designated for the same habitats and species (see above).	**Section 3.11.3.**
Newton Marsh	SSSI	0.02	This site is near to the Ribble Estuary SSSI/NNR and was formerly a saltmarsh habitat. It is now an area of grazed and improved pasture, but many pools and ditches remain. This relatively undisturbed habitat provides additional refuge and protection from high tides for many migratory birds. Over 100 bird species have been recorded here, with the area supporting around 10,000 individuals each winter. Notable species include golden plover *Pluvialis apricaria*, lapwing *Vanellus vanellus*, snipe *Gallinago gallinago*, and black-tailed godwit *Limosa limosa*. Rare flowering rush *Butomus umbellatus* and spiked sedge *Carex spicata* have been recorded here. Neither of the interest features of the SSSI (aggregations of golden plover and black-tailed godwit) are relevant to onshore ecology and nature conservation. A baseline characterisation of the ornithology importance of this designated site can be found in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.	Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.
Lytham Coastal Changes	SSSI	0.11	This SSSI is designated for its geological importance and is therefore not considered further within this chapter. Baseline characterisation of geological SSSIs can be found in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, and not considered further in this chapter.	Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.
Marton Mere	SSSI	3.78	This site is a freshwater lake of 44 acres with surrounding patches of reed and other marginal plants such as yellow flag *Iris pseudacorus*, and, rarer to the area, lesser reed mace *Typha angustifolia.* The site provides important habitat for 35 species of breeding birds and is also situated along a major migration route	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS

Site name	Designation	Distance (km)	Description	Where considered in the ES
			and offers an important resting site for over 140 bird species. A baseline characterisation of the ornithology importance of this designated site can be found in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. The majority of SSSI features are non breeding aggregations of various species of wetland birds, that are in favourable condition. The features of the SSSI relevant to onshore ecology and nature conservation are: • lowland mire grassland and rush pasture; • lowland neutral grassland (MG8); and • mesotrophic lakes. All are in favourable condition.	(**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.
Red Scar and Tun Brook Woods	SSSI	7.83	Red Scar and Tun Brook Woods is one of the largest areas of deciduous woodland in Lancashire, providing important refuge for wildlife near the urban areas of Preston. Notable plant species found here include pendulous sedge *Carex pendula,* which is scarce in Lancashire, and yellow archangel *Lamium galeobdolon,* which is also uncommon in the area and close to its northern limit. The site and surrounding woods are the only areas in North west England where the white-letter hairstreak butterfly *Satyrium w-album* is found. Similarly, the oak bush-cricket *Meconema thalassinum* is rare in the area but has been recorded in these woods. The features of the SSSI are: • lowland mixed deciduous woodland; • population of nationally scarce butterfly species - white-letter hairstreak *Satyrium w-album;* and • wet woodland. All are in favourable condition.	**Section 3.11.5**
Hesketh Golf Links	SSSI	8.01	This site includes the priority habitats of fixed dune and dune heath, and there are also mobile dunes, dune slacks, dune grasslands, ponds, scrub, semi-natural woodlands and conifer plantations. These habitats support a population of the protected sand lizard	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS

Site name	Designation	Distance (km)	Description	Where considered in the ES
			Lacerta agilis. The feature of the SSSI is sand lizard that is in unfavourable declining condition.	(**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.
Sefton Coast	SSSI	8.63	Sefton Coast has an array of habitats including beaches, woodland and different types of dune systems many of which are rare and some of the best in the UK. Red squirrel, natterjack toad and sand lizard are present. The features of the SSSI relevant to onshore ecology and nature conservation are: • fixed dune grassland; • great crested newt; • humid dune slacks; • lowland dry heath; • sandhill rustic moth; • natterjack toad; • population of Red Data Book moss - long-leaved thread-moss *Bryum neodamense*; • population of Red Data Book plant - grey hair-grass *Corynephorus canescens*; • population of Wildlife and Countryside Act Schedule 8 liverwort - petalwort; • sand dune; strandline, embryo and mobile dunes (SD1-6); • sand lizard; • SM4-28 – saltmarsh; and • vascular plant assemblage. Condition is not recorded with the exception of fixed dune grassland which is in unfavourable declining condition.	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS (**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.
Beeston Brook Pasture	SSSI	8.70	This site is one of the only remaining unimproved, herb-rich pastures in this area of Lancashire. These pastures are becoming increasing scarce nationally and have been greatly reduced in Lancashire due to agricultural intensification. The site comprises a species-rich neutral grassland community, scattered scrubland, and	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS (**Table 3.21**), the

Site name	Designation	Distance (km)	Description	Where considered in the ES
			areas of rush pastures where the ground is more wet. The feature of the SSSI is lowland neutral grassland (MG5) that is in unfavourable declining condition	distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.
Wyre Estuary	SSSI	8.81	The Wyre Estuary is an important part of Morecambe Bay, the second largest intertidal estuarine flat in Britain, which is of international and national significance for wintering birds. The estuary contains the largest area of ungrazed saltmarsh in North West England and supports hundreds of wintering birds such as black-tailed godwit, turnstone *Arenaria*, teal *Anas crecca*, and many golden plover and lapwing which roost here at low tide. The saltmarshes here contain rich plant communities and the nationally scarce lax-flowered sea-lavender *Limonium humile* has also been recorded. The features of the SSSI relevant to onshore ecology and nature conservation are: • estuaries; and • sand dune; strandline, embryo and mobile dunes (sd1-6). Condition is not recorded.	Not considered further. No impacts on this designated site are considered likely, when considering the impacts scoped in for assessment (**Table 3.18**) the MDS (**Table 3.21**), the distance of the designated site from the Transmission Assets and the qualifying features for which this designated site is designated.

3.6.1.7 Of these, the Onshore Order limits lie within the impact risk zones for the Lytham St Annes Dunes, Ribble Estuary and Newton Marsh. SSSI impact risk zones can be used by Local Planning Authorities (LPAs) to consider whether a proposed development is likely to affect a SSSI and determine whether they will need to consult Natural England to seek advice on the nature of any potential SSSI impacts and how they might be avoided or mitigated. Impacts on SSSIs are considered in **sections 3.11.2, 3.11.4 and 3.11.5. Section 3.6.4** identifies the IEFs taken forward for assessment.

3.6.1.8 The desk study identified that there a total of 39 locally designated sites within 2 km of the Onshore Order Limits, including two LNR and 37 BHSs. Information on all sites is provided in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES. Additionally, six biodiversity roadside verges were identified within 2 km of the Onshore Order Limits.

3.6.1.9 The two LNRs are:

- Lytham St Annes, which is located within the Lytham St Annes Dunes SSSI and partly within the Onshore Order Limits and is designated for its species rich sand dunes; and

- Fishwick Bottoms (east of Clifton), which is located 0.03 km from the Onshore Order Limits and is designated for semi-natural broadleaved woodland, grassland ponds and ditches.

3.6.1.10 Impacts on Lytham St Annes LNR are assessed in **section 3.11.4** of this chapter. No impacts on Fishwick Bottoms LNR (east of Clifton) are predicted due to its location outside the Onshore Order Limits.

3.6.1.11 With respect to changes in air quality, the following designated sites have been identified within 200 m of the M6 (between J31A and J31), which is part of the road network on which construction traffic has been modelled:

- Pope Land Open Space LNR of which part is also designated as Pope Lane Ponds BHS, contains damp and marshy grassland with sedges and rushes that provides terrestrial habitat for GCN that utilise ponds in the BHS;
- Grange Valley LNR contains wildflower meadows that support a variety of butterflies and other invertebrates, as well as small mammals; and
- Fishwick Bottoms (Ribbleton) LNR also designated as Brockholes Wood BHS and part is an ancient woodland. It contains woodland, grassland and wetland habitat. The area within 200m of the M6 is woodland.

3.6.1.12 Twelve BHSs are located partly within the Onshore Order Limits. Information on these sites is provided in **Table 3.9** below. The location and geographic extent of locally designated sites, including LNR and BHSs within 2 km of the Onshore Order Limits is presented in Figure 3.5 (see Volume 3, Figures).

Table 3.9: BHSs located partially within Onshore Order Limits

Site name	Features/reason for designation
Booth's Plantation	The site comprises an area of oak woodland situated on the south slope of Mill Brook Valley which has characteristics of being ancient woodland although the site is not listed on the Natural England Ancient Woodland Inventory.
Freshfield Farm Pond, North	A field pond with a rich diversity of plants and animals including nationally scarce invertebrates, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*. The site is designated for a rare liverwort *Riccia fluitans*, for its population of nationally scarce scavenger water beetle *Cercyon convexiusculus*.
Freshfield Farm Pond, South	A field pond, formerly a marl pit, supporting a bog community including open water and sphagnum. The pond supports nationally scarce invertebrates and common frog. The site is designated for its population of the nationally scarce water beetle *Ilybius guttiger*, and the mud pond snail *Lymnea glabra.*
Howick Hall Ponds	A cluster of field ponds and surrounding terrestrial habitat supporting diverse aquatic flora and breeding populations of four amphibian species including GCN. The site is designated for its amphibian assemblage, three nationally scarce water beetles (*Ilybius guttiger*, *Cercyon ustulatus* and *Helochares lividus*) and for its significant county populations of six species of aquatic plants which are classed as sensitive or vulnerable in Lancashire (lesser marshwort *Apium inundatum*, horned pondweed, white water-lily, greater spearwort *Ranunculus lingua*, water-soldier *Stratiotes aloides* and galingale *Cyperus longus*).
Lea Marsh	Grazing marsh including a tidal section of Savick Brook and several creeks. Supports a good assemblage of salt marsh and freshwater flush plant species including nationally scarce species. The site is designated for its coastal saltmarsh habitat and for the

Site name	Features/reason for designation
	nationally scarce long stalked orache *Atriplex longipes*, the county endangered meadow barley *Hordeum secalinum*.
Lytham Foreshore Dunes and Saltmarsh	Coastal habitat extending for 10 km including sand dunes, dune grassland, saltmarsh, foreshore with shingle, sand and mudflats. The sand dunes support diverse plant and invertebrate communities. The site is designated for its saltmarsh, shingle sand dunes and mudflats. It is also designated for three nationally scarce plants, (Isle of Man cabbage *Coincya monensis* subsp*. monensis,* Portland spurge *Euphorbia portlandica* and dune fescue), for significant county populations of 12 sensitive or vulnerable plant species in Lancashire (pyramidal orchid, sea spurge *Euphorbia paralias*, common broomrape, bloody crane's-bill *Geranium sanguineum*, marsh helleborine *Epipactus palustris*, sea holly *Eryngium maritimum*, sand cat's-tail *Phleum arenarium*, hound's-tongue *Cynoglossum officinale*, spring vetch *Vicia lathyroides*, early forget-me-not *Myosotis ramossisima,* saltmarsh flat-sedge *Blysmus rufus* and sea kale *Crambe maritima*), the moss *Tortula ruralis ssp. Ruraliformis* (rare in Lancashire), the nationally rare wainscot moth *Mythimna litoralis* and the striped snail, *Cernuella virgata*, which has restricted distribution in Lancashire.
Lytham Moss	Farmland covering 283 hectares (ha) and designated for wintering pink footed goose *Anser brachyrhychus* and whooper swan *Cygnus cygnus*.
Mason's Wood	Broadleaved woodland on a steep south facing bank, dissected by ditches. The ground flora includes ancient woodland indicator species but the wood is not listed on the Natural England Ancient Woodland Inventory despite being larger than the 2 ha threshold for inclusion.
Mill Brook Valley	Species rich neutral grassland with scattered scrub either side of a brook. The site is designed for its old established neutral grassland with at least 10 indicator species.
River Ribble, Lower Tidal Section	The site comprises the tidal length of the River Ribble and associated habitats not included in the adjoining Ribble Estuary SSSI. Habitats present include rivers and streams, saltmarsh, grassland, trees and scrub, and sand dune. The site is designated for the river and streams, coastal saltmarsh, species-rich grassland and mudflats, artificial habitats (former sand and silt dredgings), unspecified semi-natural habitat mosaic, nationally scarce long-stalked orache and spiny restharrow *Ononis spinosa* which is classed as threatened in Lancashire.
Savick Bridge	A short tidal section of Savick Brook with associated tall herb, swamp, scrub and deciduous woodland. The site is designated for its swamp and fen habitat and for the nationally scarce long-stalked orache.
St. Anne's Old Links Golf Course and Blackpool South Railway Line	A mosaic of relict dune grassland, dune heath and sand dune within the wider golf course. The site is a fragment of the much larger Fylde dune system prior to the 19th and 20th century resort development. The site supports several plant species of local interest. The site is designated for its coastal sand dune, yellow bartsia and chaffweed *Anagallis minima* (both classed as endangered in Lancashire). It is also designated for Grass-of-Parnassus *Parnassia palustris* (classed as vulnerable in Lancashire) and trailing St. John's-wort *Hypericum humifusum* (classed as sensitive in Lancashire) with a significant county population of both species within the site.
Westby Clay Pit	A former clay pit now supporting a mosaic of ponds, marsh, grassland, scrub and hedgerows. The site is recognised for its diverse flora as well as its value for amphibians, dragonflies, damsel flies and butterflies. The site is designated for its good population of GCN and for its assemblage of amphibians which also includes common frog, smooth newt, common toad *Bufo bufo*, and palmate newt *Lissotriton helveticus,* though there are no recent records for the latter two species. The site is also designated for Brackish water-crowfoot *Ranunculus baudotii* (classed as vulnerable in Lancashire and with a significant county population within the site), and for nationally scarce invertebrates (unspecified).

3.6.1.13 One further BHS is located within 150 m of the Onshore Order Limits, which is designated in part for the presence of notable species of birds. This is Pippy Lane Banks, which is located 40 m from the Onshore Order Limits.

3.6.1.14 Details of the remaining BHSs within the onshore ecology study area are provided in Annex 3.1 Onshore ecology desk study technical report of the ES. Impacts on BHSs are set out in **section 3.11.5** of this chapter. **Section 3.6.4** identifies the IEFs taken forward for assessment.

3.6.1.15 The following BHS are relevant to the assessment changes in air quality only, which are all within 200 m of the road network on which construction traffic has been modelled. Most are situated to the east of the Onshore Order Limits.

3.6.1.16 **Table 3.10** below provides information on the criteria for their designation, which has been used to identify relevant habitats for air quality assessment, as well as the name of the roads on which construction traffic has been modelled.

3.6.1.17 Biodiversity verges are areas which have been selected for their high biological diversity. These areas benefit from verge specific management recommendations which aim to support that diversity and promote nature recovery. One biodiversity verge, Queensway grassland biodiversity verge, is within the Onshore Order Limits. The locations and geographical extent of the biodiversity verges are shown in Volume 3, Annex 3.1: Onshore ecology desk study of the ES.

3.6.1.18 Biodiversity Verges are roadside or highway verges which have been recognised for their significance for biodiversity in the context of Lancashire, Blackpool and Blackburn with Darwen. These areas form important refuges and networks of connectivity for wildlife. Queensway grassland biodiversity verge is located where trenchless techniques are proposed (see Volume 1, Annex 3.2: Onshore crossing schedule of the ES), and as such no direct or indirect impacts are anticipated on this biodiversity verge. As no other biodiversity verges are located within the Onshore Order Limits, they have not been considered further within this chapter.

Table 3.10: BHSs located within 200m of roads on which construction traffic has been modelled.

Road name and location	BHS name	Other applicable designation	Habitat for air quality assessment	Criteria for BHS designation
A582 Edith Rigby Way from A583; and Avice Pimblett Way and M6 (North of M55 junction)	Lancaster Canal Whole Length in Lancashire Including Glasson Branch	NA	Standing open water and canals (not in APIS 'location search') so fen, marsh, swamp (rich fen) is used.	Any site which supports a population of a species categorized as 'Endangered' (Ff3), 'Vulnerable' (Ff4a) or 'Sensitive' (Ff4b) in Provisional Lancashire Red Data List of Vascular Plants where such populations contribute exceptionally to the distribution pattern, or the total population size of that species in the County.
A582 Edith Rigby Way between William Young Way; and M55 Junction 2 and M55 between J1 (A6) and J2 (PWD)	Bartle Wetland	NA	Fen, marsh, swamp (rich fen).	(Fe1) Swamp and fen sites over 0.5 ha and in excess of 20 m wide.
M6 between J32 and J31A	Haighton Park and Fulwood Park Woods	Ancient woodland	Broadleaved, mixed and yew woodland.	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation. (Wd2) Other semi-natural woodlands over 1 ha where field evidence indicates that they are ancient in origin.
M6 between J31A and J31	Brockholes Quarry	NA	Neutral grassland and fen, marsh, swamp (rich fen) beyond approximately 75 m.	(Od5) Any site which regularly supports a breeding population of 11 or more species of dragonfly or damselfly.
M6 between J31A and J31	Brockholes Wood	Ancient woodland, LNR	Broadleaved, mixed and yew woodland.	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation.

Road name and location	BHS name	Other applicable designation	Habitat for air quality assessment	Criteria for BHS designation
M6 between J31A and J31	Pope Lane Ponds	LNR	Neutral grassland and fen, marsh, swamp (rich fen) beyond approximately 80 m.	(Ff3) Any site which supports a population of a species categorized as “Endangered” in Provisional Lancashire Red Data List of Vascular Plants. (Po1) Standing water bodies less than 2 ha with a Lancashire Pond Score that meets criteria for designation.
M6 between J31A and J31	River Ribble from London Road Bridge Preston, in West, to County Boundary, in East	NA	This is a large river. Fen, marsh, swamp (rich fen) is the most appropriate available habitat at this location.	There are no criteria for rivers. This site is designated for scarce bryophytes (Br3), scarce and protected vascular plants (Ff4) and invertebrates (In1) including molluscs (Mo1) of which none are likely to be present at this location, and protected mammals (likely to be otter and water vole).
M6 between J31 and J30	Cuerdale and Walmsley Fold Woods Cuerdale Wood	Ancient woodland	Broadleaved, mixed and yew woodland	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation. (Wd1).
M65 east of J2 (M61 junction)	Laund Wood and Ollerton Wood	Ancient woodland	Broadleaved, mixed and yew woodland	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation.
M61 south of M61 J9 (M65 junction)	Leeds/Liverpool Canal (Walton Summit Branch)	NA	Fen, marsh and swamp (rich fen)	(Ar1) Sites which are considered to contribute significantly to the biodiversity of the Landscape Character Tract in which they occur:
M61 south of M61 J9 (M65 junction)	Denham Wood	NA	Broadleaved, mixed and yew woodland	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation. (Wd2) Other semi-natural woodlands over 1 hectare where field evidence indicates that they are ancient in origin.
M6 between M6 J30 (M61 junction) and A6 junction	Cuerden Valley Park and River Lostock	NA	Fen, marsh and swamp (rich fen) and neutral grassland and broadleaved, mixed and yew woodland at > 150m	(Gr3) Areas of old established seminatural grassland over 0.5 ha (Od3) Any site which regularly supports a breeding population of a species of dragonfly or damselfly which is identified as Rare within Lancashire in the current list of Lancashire Key Species.

Road name and location	BHS name	Other applicable designation	Habitat for air quality assessment	Criteria for BHS designation
M6 south of J29 (M65 junction)	Holt Brow Wood and Foxholes Wood	NA	Broadleaved deciduous woodland	(Ff4b) Any site which supports a population of a species categorized as “Sensitive” in Provisional Lancashire Red Data List of Vascular Plants where such populations contribute exceptionally to the distribution pattern, or the total population size of that species in the County. (Wd2) Other semi-natural woodlands over 1 ha where field evidence indicates that they are ancient in origin.
M65 east of J2 (M61 junction)	Haddock Park Wood	Ancient woodland	Broadleaved deciduous woodland	(Wd1) Sites included on the Lancashire Inventory of Ancient Woodland which support semi-natural woodland vegetation.
M61 south of M61 J9 (M65 junction)	Lucas Lane Pasture	NA	Neutral grassland	(Gr3) Areas of old established seminatural grassland over 0.5 ha.

Local Nature Recovery Strategy

3.6.1.19 The emerging Local Nature Recovery Strategy for Lancashire is coordinated by Lancashire County Council with support from the county's local authorities including Blackpool Council, Fylde Borough Council, Preston City Council and South Ribble Borough Council. Further key partners include the Environment Agency, Natural England, Wildlife Trusts and Rivers Trusts. The aim is that the strategy documents are published by the end of March 2025. Step 1 of the process, to map areas of particular importance for biodiversity, is complete and interactive maps are available. The spatial component of the strategy includes the statutory and non-statutory sites listed in **Table 3.7**, **Table 3.8** and **Table 3.9**, as well as the woodland and grassland ecological networks described below. Further steps of the strategy are in progress, including review of opportunities and constraints, preparing a long list of key species and associated habitat assemblages, and developing priorities and measures to achieve them.

Habitat inventories

3.6.1.20 The desk study provided information on ancient woodland, ancient, veteran and notable trees and nine habitats that are classified as priority habitats within the onshore ecology study area. Information is detailed in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES and is summarised below.

Ancient woodland

3.6.1.21 One ancient woodland, classified as ancient semi-natural woodland on the Ancient Woodland Inventory, is located within 2 km of the Onshore Order Limits (0.25 km to the east of the Onshore Order Limits). In addition, Booth's Plantation BHS is described as ancient semi-natural woodland on the south slope of Mill Brook Valley, and is located partly within the Onshore Order Limits. However, the site is not listed on the Ancient Woodland Inventory. The location of ancient woodland and inventory sites within 2 km of the Onshore Order Limits is present in Figure 1.11 of Volume 3, Annex 3.1: Onshore ecology desk study of the ES. The location of Booth's Plantation BHS is shown in Figure 3.5 (see Volume 3, Figures of the ES).

3.6.1.22 The following ancient woodlands are relevant to the assessment changes in air quality only, which are all within 200 m of the road network on which construction traffic has been modelled and meet the thresholds for inclusion in the assessment. Most are situated to the east of the Onshore Order Limits. **Table 3.11** below provides information on their classification, as well as the name of the roads on which construction traffic has been modelled.

Table 3.11: Ancient woodland located within 200 m of roads on which construction traffic has been modelled.

Road name and location	Classification of wood	Name of wood	Other applicable designation
M6 between J32 and J31A	Ancient and Semi-Natural Woodland	Fulwood Park Woods	BHS
M6 between J31A and J31	Ancient and Semi-Natural Woodland	Brockholes Wood	BHS, LNR
M6 between J31A and J31	Ancient and Semi-Natural Woodland	Red Scar/Tun Brook Woods	SSSI
M6 between J31 and J30	Ancient and Semi-Natural Woodland	Cuerdale Wood East	BHS
M6 between J31 and J30	Ancient and Semi-Natural Woodland	Curdle Wood	BHS
M6 between J31 and J30	Ancient Replanted Woodland	Mosney Wood	NA
M65 east of J2 (M61 junction)	Ancient Woodland	unnamed – Laund Wood and Ollerton Wood BHS	BHS
M65 east of J2 (M61 junction)	Ancient Replanted Woodland	Haddock Park Wood	BHS

Ancient, veteran and notable trees

3.6.1.23 Twenty-nine ancient tree inventory trees are located within 2 km of the Onshore Order Limits comprising four ancient, 11 veteran and 14 notable trees. A single veteran tree (common oak *Quercus robur*) is located within the Onshore Order Limits. There are no other ancient, veteran or notable trees within 100 m of the Onshore Order Limits. The location of ancient, veteran and notable trees within 100 m of the Onshore Order Limits is present in Figure 1.12 of Volume 3, Annex 3.1: Onshore ecology desk study of the ES.

Priority habitats

3.6.1.24 Priority habitats are habitats that are of principal importance for conserving biodiversity under section 41 of the Natural Environment and Rural Communities Act 2006.

3.6.1.25 The desk study identified seven priority habitat types within the Onshore Order Limits. These cover a total area of 139.69 ha. A further 222.27 ha of priority habitats are present within 2 km of the Onshore Order Limits, including four additional habitat types. The data is from Natural England's Priority Habitats Inventory (England).

3.6.1.26 A description of the extent and distribution of priority habitats within the Onshore Order Limits and 2 km buffer is provided in Figure 3.13 of Annex 3.1: Onshore ecology desk study technical report of the ES and summarised in **Table 3.12** below.

Table 3.12: Priority habitats located in and within 2 km of the Onshore Order Limits

Priority habitat	Within the Onshore Order Limits (ha)	Within 2 km of the Onshore Order Limits (ha)
Coastal and floodplain grazing marsh	92.05	1240.19
Coastal saltmarsh	24.43	164.91
Coastal sand dunes	18.62	5.59
Lowland mixed deciduous woodland	1.44	282.57
Good quality semi-improved grassland	2.25	6.37
No main habitat but additional habitats present	0.90	54.29
Lowland fens	0.00	60.3
Lowland meadows	0.00	4.37
Mudflats	0.00	1.97
Traditional orchard	0.00	6.03
Ponds	Two BHS sites containing qualifying ponds.	3 BHS sites containing qualifying ponds.

3.6.1.27 Priority habitats are defined according to the UK Biodiversity Action Plan: Priority Habitat Descriptions, which are summarised below as follows.

- Coastal and floodplain grazing marsh: Periodically inundated pasture or meadow (typically grazed or cut for hay or silage) with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities. Grazing marshes are particularly important for the number of breeding waders and can be of international importance for wintering wildfowl.
- Coastal saltmarsh: The unamended description includes definition of saltmarsh vegetation as consisting of a limited number of halophytic (salt tolerant) species adapted to regular immersion by the tides. A natural saltmarsh system shows a clear zonation according to the frequency of inundation.
- Coastal sand dunes: The unamended description refers to sand dunes vegetation as being related to the time elapsed since the sand was deposited, the degree of stability which it has attained, and the local hydrological conditions. It includes embryonic, mobile and semi fixed dunes that are recent, unstable and species-poor, and fixed dunes which may be acidic or calcareous and can support diverse and distinctive plant and invertebrate communities. Dune slack vegetation occurs in wet depressions between dune ridges. Fixed dunes and dune heath are particularly threatened habitats and are regarded as priorities under the Habitats Directive.

- Lowland mixed deciduous woodland: Woodland referable to this habitat type occurs in widely varying conditions in lowland landscapes. It includes ancient woodland and there is often evidence of previous traditional management practices. The woods tend to be small, less than 20 ha. In terms of the NVC the majority are W8: ash, field maple and dog's mercury *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland and W10 pedunculate oak, bracken and bramble Quer*cus robur - Pteridium aquilinum - Rubus fruticosus* woodland.
- Good quality semi-improved grassland: Is not a priority habitat and no definition is provided. However, data is included in Natural England's Priority Habitats Inventory (England).
- No main habitat but additional habitats present: This is not a priority habitat and no definition is provided. It occurs where no main habitat can be identified the whole polygon is mapped as '*No main habitat but additional habitats [present]*' and the priority habitats thought to be present are shown within the attribution as additional habitats.
- Lowland fens: Fens are peatlands which receive water and nutrients from the soil, rock and ground water as well as from rainfall and may be dependent on lateral or vertical ground water flows. Fens can also be described as `poor-fens` or `rich-fens`. The former are acidic and characterised by short vegetation with a high proportion of bog mosses *Sphagnum spp.* and acid water (pH of 5 or less). The latter are fed by mineral-enriched calcareous waters. Fen habitats can be exceptionally rich in plants and invertebrates.
- Lowland meadows: Include most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK. In terms of NVC plant communities, they primarily embrace each type of crested dogs-tail common knapweed *Cynosurus cristatus - Centaurea nigra* grassland, meadow foxtail great burnet *Alopecurus pratensis - Sanguisorba officinalis* floodplain meadow and crested dog's-tail – marsh marigold *Caltha palustris* flood-pasture. They include those cut for hay and where livestock grazing is the main land use, as well as those in other settings.
- Mudflats: Are sedimentary intertidal habitats created by deposition in low energy coastal environments, particularly estuaries and other sheltered areas. Their sediment consists mostly of silts and clays with a high organic content. Mudflats are characterised by high biological productivity and abundance of organisms, but low diversity with few rare species. They provide feeding and resting areas for internationally important populations of migrant and wintering waterfowl and are also important nursery areas for flatfish.
- Traditional Orchards: Groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland; and managed in a low intensity way.

Lancashire Ecological Network

3.6.1.28 In Lancashire on behalf of the Local Nature Partnership, ecological networks for woodland, grassland and wetland and heath have been developed by LERN and the Lancashire Wildlife Trust. Ecological networks can provide an appropriate spatial planning tool to help identify useful integration with River Basin District planning measures. In this way, the potential exists to deliver additional benefits for ecological connectivity and enhanced resilience to climate change. The woodland and grassland networks form part of the spatial basis for the emerging Local Nature Recovery Strategies for Lancashire discussed above in **paragraph 3.6.1.19.** Consequently, these networks are of county importance.

3.6.1.29 Ecological networks in Lancashire consist of the following components (LERN, 2015).

- Core areas: identified wildlife sites of at least county importance. Core areas are classified by the priority habitat groupings for which they are of importance. The following types of wildlife site are included in core areas: internationally important wildlife sites; biological SSSIs; BHSs; LNR of county importance.
- Least cost movement corridors: areas most likely to support successful movements between identified core areas. These are classified by length. They do not represent areas of ecologically important habitat, rather the most effective (hence 'least cost') movement corridors between the core areas based on the characteristics the wider landscape, including the presence of barriers to dispersal.
- Stepping stones: sites of local ecological importance that include district level wildlife sites and LNR (of district wildlife significance) and important road verges. These are classified in respect of the priority habitats they support.
- Stepping stone habitats: consisting of existing suitable priority habitat within the corridors. These are drawn from the habitats data.

3.6.1.30 Various areas of woodland and grassland that make up the Lancashire woodland and grassland ecological networks pass through the Onshore Order Limits directly. Further details on the Lancashire Ecological Network can be found in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES. Woodland, grassland and heathland and wetland networks are also a biodiversity consideration in terms of planning and development control at the District and Unitary Authority level.

Local development plan policy areas

3.6.1.31 Semi-natural green spaces, wildlife corridors, woodland sites and green infrastructure sites are identified within the Preston City Local Plan and Fylde Local Plan, of these, there are several areas that pass through the Onshore Order Limits. Further details on local development plan policy areas can be found in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES. The location and geographical extent of these areas can be found

on Figure 1.16 of Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

Protected and notable species

3.6.1.32 The desk study has also provided records for protected and notable species within the study area, including flora, terrestrial invertebrates and amphibians and reptiles, as set out below.

Plants

3.6.1.33 The desk study records from LERN includes 102 species of flowering plant, two fern species, two horsetail species and one moss species within 1 km of the Onshore Order Limits, of which 51 occur within the Onshore Order Limits. Forty five of these species can be a reason for designation of BHSs, unless the populations present are a result of recent, deliberate introduction. Sixteen species are identified as being at risk through inclusion in other lists as being nationally rare or scarce, vulnerable or near threatened. An ecological evaluation of the Fylde sand dunes, which are wholly included in the designated sites listed below, contains numerous additional records for rare and threatened plants. The majority of records within the Onshore Order Limits are associated with Lytham St Annes Dunes SSSI, Ribble Estuary SSSI, Lytham Foreshore Dunes and Saltmarsh BHS, St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS and River Ribble, Lower Tidal Section BHS. These sites are all designated in part for their habitats and populations and assemblages of plants, of which the recorded species are a part, and which are therefore of national or county importance in accordance with the applicable designations. Elsewhere, records are scattered and unlikely to represent established populations and are consequently of up to local importance.

3.6.1.34 Howick Hall Ponds, Lea Marsh, Mason's Wood and Mill Brook Valley BHS, among others, are designated in part for their species-rich plant assemblages but, with the exception of Mason’s Wood for which there are records considered to be of local interest, no desk study records are provided for them.

Invertebrates

3.6.1.35 The desk study records from LERN includes 31 species of invertebrates within 1 km of the Onshore Order Limits, of which six (all butterflies) occur within the Onshore Order Limits. Five of these species can be a reason for designation of a BHS and five are included on other lists noted above for plants. Five species: dark green fritillary *Argynnis aglaja,* brown argus *Aricia agestis,* northern brown argus *Aricia artaxerxes,* small heath *Coenonympha pamphilus* and grayling *Hipparchia semele* are associated with dry, species-rich, calcareous and coastal grassland and dune habitats. An ecological evaluation of the Fylde sand dunes contains additional records for rare and threatened invertebrates. They predominantly occur in Lytham St Annes Dunes SSSI and Lytham Foreshore Dunes and Saltmarsh BHS. Both sites are designated in part for their invertebrate assemblages. As such the

populations of these species are of national or county importance in accordance with the applicable designations. The remaining species speckled wood *Pararge aegeria* are widespread and populations present are considered to be of up to local importance.

3.6.1.36 Freshfield Farm Pond, North, Freshfield Farm Pond, South and Westby Clay Pit BHS, among others, are designated in part for the (predominantly aquatic) invertebrate assemblages they support but no desk study records are provided for them.

Amphibians

3.6.1.37 LERN data contains records for five amphibian species, including GCN, within the Onshore Order Limits, as well as at other locations within 2 km study area of the Order Limits. They are summarised below in **Table 3.13,** the number of occurrences and life stages present for each record is not known in all cases and therefore omitted.

Table 3.13: Summary of amphibian desk study records within study area of the Onshore Order Limits

Species	Date of records	Number of records
Common frog	2012 to 2020	115 (20 within the Onshore Order Limits)
Common toad	2012 to 2019	205 (12 within the Onshore Order Limits)
GCN	2012 to 2020	475 (47 within the Onshore Order Limits)
Palmate newt	2012 to 2019	20 (9 within the Onshore Order Limits)
Smooth newt	2012 to 2019	202 (24 within the Onshore Order Limits)

3.6.1.38 The records for GCN within the Onshore Order Limits are largely within the 400 kV grid connection cable corridor. Eggs or juvenile GCN indicating breeding populations of GCN have been recorded at approximately 500 m from the Onshore Infrastructure Area (the Onshore Order Limits, excluding those areas proposed only for ecological mitigation/biodiversity benefit). Several adults of both sexes have been identified, as well as eggs. Records of various life stages indicates the presence of breeding GCN in the study area.

3.6.1.39 BHS selection criteria for amphibians state that sites should reflect the habitat requirements of the population or assemblage that has been recorded, and therefore contain one or more waterbodies that provide breeding habitat, as well as sufficient terrestrial habitat. Sites should contain all ponds that are separated by distances of 250 m or less unless separated by obvious barriers to dispersal.

3.6.1.40 Sites supporting ‘good’ populations of GCN (5-50 seen or netted during the day or 10-100 counted at night should be considered for designation as a BHS, as per the guidelines for selection of BHS in Lancashire. It is not possible to determine population size from the available data, or therefore identify records that may represent groups of ponds and associated habitat that would meet BHS selection criteria for GCN. Consequently, on a

precautionary basis, the desk study data is assumed to represent an unknown number of sites that are of county importance because they support a good population of GCN.

3.6.1.41 Sites that support 'exceptional' populations of a species of amphibian other than GCN should be considered for selection of BHS. There is a concentration of desk study records for common toad (for which an 'exceptional' population is a confirmed count of 1,000 individuals or an estimate of 5,000) that are likely to have been collected for the construction of the Preston Western Distributor Project (Edith Rigby Way), to the north of the Onshore Order Limits. The ecology chapter of the ES for the Preston Western Distributor Project provides data from extensive amphibian surveys, including counts for common toad in ponds and in terrestrial habitat. Common toad were recorded in 34 of 140 ponds across the study area. There was a peak count of 265 adults and it was considered highly unlikely that the population would meet the criteria required to be an 'exceptional' population. The population was evaluated as being of local importance for biodiversity. Elsewhere, records for common toad and other amphibian species within a 2 km buffer of the Onshore Order Limits are more scattered and also considered to indicate the presence of populations of local importance.

3.6.1.42 Sites that support a diverse assemblage of amphibians (defined as five native species, excluding natterjack toad) should also be considered for selection of a BHS. Based on information provided in the citation, a diverse amphibian assemblage was present at Westby Clay Pits BHS until common toad and palmate newt ceased to breed there. Elsewhere, the desk study records and information on the wider distribution of amphibian species in Lancashire indicate that sites with diverse assemblages of amphibian species are unlikely to be present in the study area. This assessment is based on the nature of habitats in the study area and because are few records for palmate newt, meaning that few sites would support five or more species. Therefore, amphibian assemblages are considered to be of local importance.

Reptiles

3.6.1.43 Three species of reptile have been recorded within 2 km of the Onshore Order Limits.

3.6.1.44 A population of sand lizard is present in foredune/frontal dune habitat within the Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI and is located within the Onshore Order Limits. It is understood to have resulted from an introduction of 403 sand lizards in 2018 to extend the range of the Merseyside population into the sand dunes on the northern side of the Ribble. Monitoring has taken place since 2021 and good numbers of sand lizard have been recorded in subsequent years, including adults, juveniles and hatchlings, and the population has spread from the area of introduction. Habitat management work to extend the frontal dunes and encourage undisturbed establishment of the existing and developing dune hills behind this has extended the area of suitable semi-fixed dune which is favoured by sand lizard. This species is not a reason for BHS selection but the population

is part of a recognised reintroduction program, and is considered to be of regional importance.

3.6.1.45 Slow worm *Anguis fragilis* is a reason for the selection of a BHS due to its rarity and long term decline in Lancashire. The available data is limited but there are seven records for this species in locations approximately 880 m north east and 1.4 km north of the Onshore Order Limits. This is considered unlikely to represent populations that would result in BHS designation and is therefore of local importance. Common lizard *Zootoca vivipara,* for which there are records in sand dune habitat, are not a reason for BHS selection and populations in this area are of local importance.

Bats

3.6.1.46 There are 439 records of bats between 2021 and 2023 within 2 km of the Onshore Order Limits. The records include seven different species and 169 records of bats that could not be identified to species level, meaning the number of species could be greater. The confirmed species are as follows:

- common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus* that are widespread throughout northern England;
- Daubenton's bat *Myotis daubentonii* and noctule *Nyctalus noctula* that are widespread in many places but not as abundant; and
- Nathusius' pipistrelle *Pipistrellus nathusii* that is rarer and/or has a more restricted distribution in northern England.

3.6.1.47 Brown long-eared bat, noctule and soprano pipistrelle are species of principal importance.

3.6.1.48 Regularly occupied roosts of any bat species are a consideration for BHS designation but is it not possible to establish that records provided are for roosts.

Badger

3.6.1.49 There are 14 records for badger between 2014 and 2019 within 2 km of the Onshore Order Limits. Badger are 'least concern' according to IUCN criteria and are not a reason for BHS selection. Therefore, badger are of local importance.

Otter and water vole

3.6.1.50 There are 12 records for otter between 2018 and 2020 and five records for water vole between 2014 and 2020 within 2 km of the Onshore Order Limits. Both are fully protected species of principal importance and can be a reason for designation of a BHS where they breed regularly or are dependent on a site for other reasons. Therefore, populations of these species are of county importance.

Other mammals

3.6.1.51 There are 122 records (two within the Onshore Order Limits for West European hedgehog *Erinaceus europaeus* between 2014 to 2020 and 36 records for brown hare *Lepus europaeus* (two within the Onshore Order Limits) between 2014 to 2020. Both are species of principal importance but not a consideration in designation of BHS and populations present are likely to be of local importance.

Fish

3.6.1.52 The desk study identified one species of fish of relevance to onshore ecology and nature conservation within 2 km of the Onshore Order Limits - European eel *Anguilla Anguilla,* which is listed as critically endangered. The Environment Agency's data for the Ribble Estuary contains records from 2002- 2023. There are infrequent records for protected and notable species, which are for Atlantic salmon *Salmo salar*, brown sea trout *Salmo trutta*, European eel, river lamprey *Lampetra fluviatilis* and smelt *Osmerus eperlanus* between 2004 and 2016. Populations of a fish species protected under the EC Habitats Directive are a reason for designation of BHS. The populations of fish in the River Ribble are of regional importance.

3.6.2 Site-specific surveys

3.6.2.1 In order to inform the ES, site-specific surveys have been undertaken. A summary of the survey findings that have informed the impact assessment is provided below.

3.6.2.2 Full survey results are detailed in the following annexes to this chapter:

- Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report of the ES;
- Volume 3, Annex 3.4: River morphology survey technical report of the ES;
- Volume 3, Annex 3.5: Aquatic invertebrate survey technical report of the ES;
- Volume 3, Annex 3.6: Terrestrial invertebrate survey technical report of the ES;
- Volume 3, Annex 3.7: Fish and eel survey technical report of the ES;
- Volume 3, Annex 3.8: Great crested newt and reptile survey technical report of the ES;
- Volume 3, Annex 3.9: Water vole survey technical report of the ES;
- Volume 3, Annex 3.10: Bat activity survey technical report of the ES;
- Volume 3, Annex 3.11: Bat roost survey technical report of the ES;
- Volume 3, Annex 3.12: Otter survey technical report of the ES;
- Volume 3, Annex 3.13: Badger survey technical report of the ES;

- Volume 3, Annex 3.14: Invasive non-native species technical report of the ES; and
- Volume 3, Annex 3.15: White-clawed crayfish survey technical report of the ES.

3.6.2.3 **Table 3.14** summarises the findings for habitat surveys that have been carried out within a 150 m buffer of the Onshore Order Limits. They comprise the phase 1 habitat, NVC, river condition assessment (using the Modular River Physical (MoRPh) field survey method) and hedgerow surveys. The table states the ecological importance of each habitat type that was recorded, principally based on their location within statutory sites for which they are a reason for designation. Information on the importance of the populations or assemblages of species that may be associated with these habitats is considered separately in **Table 3.15**.

3.6.2.4 The following habitats recorded within 150 m buffer of the Onshore Order Limits are considered to represent examples of priority habitats:

- coastal and floodplain grazing marsh (recorded as neutral grassland in phase 1 habitat survey);
- coastal saltmarsh;
- coastal sand dunes (including dune heath and dune grassland recorded in the phase 1 habitat survey);
- hedgerows;
- inland rock outcrop and scree habitats (recorded as natural inland cliff - basic in phase I classification);
- lowland fens or reedbed (recorded as swamp in the Phase 1 habitat survey);
- lowland mixed deciduous woodland;
- mudflats (recorded as intertidal mud/sand in phase 1 habitat survey);
- ponds (recorded as standing water in phase 1 habitat survey); and
- purple moor-grass and rush pasture (recorded as marshy grassland in phase 1 habitat survey).

3.6.2.5 Of these priority habitats, coastal and floodplain grazing marsh, coastal saltmarsh, coastal sand dunes, lowland fens, lowland mixed deciduous woodland and mudflats were identified in the desk study and are defined in **section 3.6.1**. The definitions of the remaining priority habitats that were recorded during the phase 1 habitat survey only are summarised as follows.

- Hedgerow: Any boundary line of trees or shrubs over 20 m long and less than 5 m wide, with gaps less than 20 m, including bank, wall, ditch herbaceous vegetation, or tree within 2 m of the centre of the hedgerow. All hedgerows consisting predominantly (i.e., 80% or more cover) of at least one woody UK native species are covered by this priority habitat.
- Inland rock outcrop and scree habitats: Are predominantly upland habitats but can occur on a wide range of rock types. They can support

diverse and specialised assemblages of plants, mosses and liverworts and lichens.

- Lowland heathland: Amended from the pre-existing description, lowland heathland is described as a broadly open landscape on impoverished, acidic mineral and shallow peat soil, which is characterised by the presence of plants such as heathers and dwarf gorses. Areas of heathland in good condition should consist of an ericaceous layer of varying heights and structures, plus some or all of the following additional features, depending on environmental and/or management conditions; scattered and clumped trees and scrub; bracken; areas of bare ground; areas of acid grassland; lichens; gorse; wet heaths, bogs and open waters.
- Ponds: Permanent and seasonal standing water bodies up to 2 ha in extent which meet one or more of a range of criteria including representing habitat types of international importance, containing species of high conservation importance and/or assemblages of key biotic groups and those that are important because of their age, rarity of type or landscape context.
- Purple moor grass and rush pastures: Occur on poorly drained, usually acidic soils in lowland areas of high rainfall in western Europe including the west of the UK. Purple moor grass *Molinia caerulea*, and rushes, especially sharp-flowered rush *Juncus acutiflorus,* are usually abundant. The best examples of lowland heath contain a wide range of plant of characteristic plant communities often in a mosaic, together with patches of wet heath, dry grassland, swamp and scrub. There are a range of key species associated plant and invertebrate communities and it provides habitat for snipe and curlew.
- Reedbed: wetlands dominated by stands of the common reed *Phragmites australis*, wherein the water table is at or above ground level for most of the year. They may contain areas of other wetland habitats such as wet woodland, wet grassland and open water and are important for a wide range of wetland birds and specialised invertebrates.

3.6.2.6 **Table 3.15**. summarises the findings of site-specific species surveys and assesses the importance of populations and assemblages of species, national and local status, including whether criteria for BHS selection are likely to be met as a basis for determining importance at the county level. All species recorded are likely to qualify as 'Lancashire Key Species' a collective term used by LERN as to refer to species which have a recognised status, either nationally or locally.

Table 3.14: Findings for habitat surveys

Broad habitat type	Description
Woodland, plantation and recently felled woodland	There is 33.02 ha of semi-natural broadleaved woodland within 150 m of the Onshore Order Limits plus 1.10 ha within the Onshore Order Limits. Therefore, there is a total area of 34.12 ha of semi-natural broadleaved woodland within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 3.2% is located within the Onshore Order Limits. Two accessible areas of woodland were selected for NVC survey. One is adjacent to and partially within Mill Brook Valley BHS and is not located within the Onshore Order Limits. This is located south west of the existing Penwortham National Grid substation. The second is Howick Hall Wood, an undesignated area north of the existing Penwortham National Grid substation and partially within the Onshore Order Limits where the boundary crosses Howick Cross Lane. The first is an example of W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland community. Canopy species included dominant sycamore *Acer pseudoplatanus* and turkey oak *Quercus cerris* while the understory consisted of frequent elder *Sambucus nigra* and other occasional species including hazel *Corylus avellana*, holly *Ilex aquifolium,* crab apple *Malus sylvestris,* rowan *Sorbus aucuparia* and *Rhododendron ponticum,* which is an invasive species. The ground layer contained a number of species, of which few such as wood millet *Milium effusum*, remote sedge *Carex remota* and honeysuckle *Lonicera periclymenum,* are typically associated with woodland. Himalayan balsam *Impatiens glandulifera*, which is an invasive species, was also recorded. The second area is an example of W8e *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum sub-community*. Canopy species included dominant beech *Fagus sylvatica* and frequent lime *Tilia x europaea* and sycamore, while the understory included frequent English elm *Ulmus procera* and hazel, as well as several further species in lesser abundance including rhododendron. The most abundant species in the ground flora were bramble *Rubus fruticosus*, wood millet and ivy *Hedera helix,* whilst all other species occurred more rarely. Wood millet and remote sedge are ancient woodland indicator species. Rhododendron and Himalayan balsam are both invasive species included on Schedule 9 of the Wildlife and Countryside Act. W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland forms the bulk of woodland that qualifies as Lowland mixed deciduous woodland priority habitat. However, these sites do not meet BHS selection criteria on the basis of size, age or species composition. Mill Brook Valley BHS is designated for its grassland rather than woodland habitat, so the site's status does not infer the importance of the area of woodland that it contains. As the surveyed areas were selected on the basis of habitat quality, the unsurveyed areas in the Onshore Order Limits, other than those contained in BHS that are designated for woodland, are likely to be of comparable quality at best and are therefore considered to be of local importance. Other woodland habitats in the Onshore Order Limits including broadleaved, coniferous and mixed plantation is considered to be of local importance.
Dense and scattered scrub	There is 27.85 ha of dense and scattered scrub within 150 m of the Onshore Order Limits plus 6.85 ha within the Onshore Order Limits. Therefore, there is a total of 34.70 ha within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 23.9% is located within Onshore Order Limits. This habitat is of local importance because it is typically,

Broad habitat type	Description
	abundant and widespread and does not have distinctive or irreplaceable characteristics, that present within the Onshore Order Limits is not likely to meet criteria for designation of BHS. Dune scrub is considered as sand dune, below
Broadleaved Parkland/scattered trees	There is 0.39 ha of broadleaved parkland/scattered trees within 150 m of the Onshore Order Limits plus 0.03 ha within the Onshore Order Limits. Therefore, there is a total of 0.43 ha of the broadleaved parkland/scattered trees, of which approximately 6.46% is located within the Onshore Order Limits. Overall, this resource is of local importance. A single veteran tree has been identified during arboricultural surveys. It is a pedunculate oak with features such as well-attached deadwood, internal decay and saprophytic fungi that indicate its veteran status. It is close to a hedgerow running east from Howick Hall Wood and is north of Howick Hall Farm. This tree is irreplaceable and of at least county importance.
Neutral, improved and marshy grassland	There is 767.21 ha of grassland habitat within 150 m of the Onshore Order Limits, of which 273.93 ha are types of neutral and marshy grassland. There is a total of 334.78 ha of grassland habitat within the Onshore Order Limits which represents approximately 30.4% of the total area (1,102.00 ha). The following areas of grassland habitat, also stated as a percentage of the total area, are present within the Onshore Order Limits: • neutral grassland - semi-improved 11.00 ha (3.3%) • improved grassland 199.33 ha (59.5%) • marsh/marshy grassland 7.51 ha (2.2%) • poor semi-improved grassland 116.94 ha (34.9%) Some areas of marshy grassland within Onshore Order Limits have characteristics of swamp because they contain a high proportion of reed sweet grass *Glyceria maxima*, along with a range of grassland and ruderal species. Where neutral grassland occurs in areas of coastal and floodplain grazing marsh priority habitat it is considered to be of up to county importance because of its connectivity with a range of riparian, wetland and coastal habitats but this priority habitat type is not a reason for selection of a BHS. Similarly, where marshy grassland has been identified as purple moor-grass and rush pasture priority habitat, which is not a reason for selection of a BHS, it is also considered to be of up to county importance. Other grassland is of local or negligible importance because they are typically, abundant and widespread and does not have distinctive or irreplaceable characteristics, that present within the Onshore Order Limits is not likely to meet criteria for designation of BHS.
Tall herb and fern	There is 6.56 ha of tall herb and fern within 150 m of the Onshore Order Limits plus 1.34 ha within the Onshore Order Limits. There is therefore a total of 7.89 ha of tall herb and fern habitat within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 31.1% is located within the Onshore Order Limits. It is of local importance it is typically, abundant and widespread and does not have distinctive or irreplaceable characteristics and would not meet criteria for designation of BHS.

Broad habitat type	Description
Swamp	The total extent of swamp within and in a 150 m buffer of the Onshore Order Limits is 0.26 ha. None is present within the Onshore Order Limits. This habitat is considered unlikely to meet criteria for BHS selection for swamp and fen in terms of extent, type and species richness and is therefore of local importance. Reedbed habitats are not included in criteria for BHS selection.
Standing water and marginal vegetation	There is 6.64 ha of standing water within 150 m of the Onshore Order Limits plus 2.83 ha within the Onshore Order Limits. There is therefore a total area 9.46 ha of standing water within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 7.0% is within the Onshore Order Limits. This habitat includes ponds that can be priority habitat and reason for designation of BHS and some have been identified as such. Ponds are of county importance. The total above includes 0.027 ha of marginal vegetation that is all outside of the Onshore Order Limits. This habitat is not a reason for BHS selection, although it can be part of other habitats which are, such as ponds, and would also be of county importance in this context.
Intertidal mud/sand	There is 40.50 ha of intertidal mud/sand within 150 m of the Onshore Order Limits plus 31.32 ha within the Onshore Order Limits. Therefore, there is a total of 71.82 ha of intertidal mud/sand within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 42.7% is within the Onshore Order Limits. Much of this habitat is within the Ribble and Alt Estuary SPA/Ramsar sites and Ribble Estuary SSSI and is of national and international importance in this context in terms the habitat it provides for species forming the reasons for designation of these sites. These areas are not discussed further in this chapter but are considered in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the ES.
Running water - brackish	There is 12.17 ha of brackish running water within 150 m of the Onshore Order Limits plus 2.22 ha within the Onshore Order Limits. There is therefore a total of 14.39 ha of brackish running water within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 15.4% is within the Onshore Order Limits. Much of this habitat is within the Ribble and Alt Estuary SPA/Ramsar sites and Ribble Estuary SSSI, and areas upstream of these sites are designated as BHS. This habitat is of county, national and international importance in this context, in terms of the habitat it provides for species forming the reasons for designation of these sites.
Saltmarsh	There is 5.33 ha of saltmarsh within 150 m of the Onshore Order Limits plus 22.25 ha within the Onshore Order Limits. There is therefore a total area of 27.58 ha of saltmarsh within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 78.3% is within the Onshore Order Limits. Much of this habitat is within Lea Marsh BHS, for which it is a reason for designation and is of county importance in this context.
Sand dune	There is 36.90 ha of sand dune habitat within 150 m of the Onshore Order Limits plus 21.63 ha within the Onshore Order Limits. There is therefore a total area of 58.53 ha of sand dune within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 37.0% is within the Onshore Order Limits. Coastal sand dunes are a priority habitat and are irreplaceable. Much of this habitat is within the Lytham St Annes Sand Dunes SSSI, for which it a reason for designation and

Broad habitat type	Description
	it is of national importance. Sand dune habitat is also present at Ribble Estuary SSSI and is a reason for designation of various BHSs, including Lytham Foreshore Dunes and Saltmarsh BHS and is of county importance in these locations. The sand dune habitat within the Onshore Order Limits comprises: • sand dune: 12.04 ha; • sand dune - dune grassland: 9.10 ha; and • sand dune - dune heath: 0.50 ha.
Hardstanding	There is 53.47 ha of hardstanding within 150 m of the Onshore Order Limits, plus 28.93 ha within the Onshore Order Limits. There is therefore a total of 82.40 ha within the onshore ecology survey area (as defined in **section 3.4.3**). The majority is within the Onshore Order Limits. This habitat is of negligible importance.
Spoil	There is <0.01 ha of spoil within 150 m of the Onshore Order Limits. This habitat is of negligible importance.
Cultivated and disturbed land	There is 236.53 ha of cultivated and disturbed land within 150 m of the Onshore Order Limits, plus 89.30 ha within the Onshore Order Limits. There is therefore a total of 325.82 ha of cultivated and disturbed land within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 27.4% is within the Onshore Order Limits. This habitat is of negligible importance.
Buildings, bare ground and other habitat	There is 160.63 ha of 'other habitats' within 150 m of the Onshore Order Limits plus 6.41 ha within the Onshore Order Limits. There is therefore a total of 167.04 ha of other habitats within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 3.8% is within the Onshore Order Limits. This habitat is of negligible importance.
Hedgerows and tree lines	There is 86.521 km of hedgerows within 150 m of the Onshore Order Limits plus 29.947 km within the Onshore Order Limits. There is therefore a total length of hedgerows of 116.469 km within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 25.7% is within the Onshore Order Limits. The hedgerow habitat within the Onshore Order Limits comprises: • intact hedge - native species-rich 1.628 km; • intact hedge - native species-poor 18.072 km; • defunct hedge - native species-rich 1.027 km; • defunct hedge - native species-poor 3.173 km; • hedge with trees - native species-rich 1.717 km; • hedge with trees - native species-poor 2.747 km; and • unspecified hedge 1.583 km.

Broad habitat type	Description
	The extent of hedgerows that meet the ecological criteria for 'important hedgerows' as defined for the Hedgerow Regulations 1997 within 150 m of the Onshore Order Limits is 3.436 km, with an additional 1.456 km within the Onshore Order Limits. Of the total length of important hedgerows (4.892 km), approximately 29.8% is within the Onshore Order Limits. Hedgerows are a priority habitat and those in the survey area contribute to a network of county importance.
Watercourses	There is 22.28 km of watercourses within 150 m of the Onshore Order Limits plus 7.039 km within the Onshore Order Limits. There is therefore a total length of 29.859 km within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 39.6% is within the Onshore Order Limits. The watercourse habitat within the Onshore Order Limits comprises: • running water 2.464 km; • running water – mesotrophic 0.725 km; and • running water – brackish 3.85 km. Eight watercourses were identified as requiring MoRPh field surveys based on the survey area, of which seven were accessible. The surveys characterised habitats within 10 m of the channel, the bank face, channel margin, and channel bed, and considered factors such as ground cover, water surface flow types, materials, vegetation, natural and artificial features, bank face profile and reinforcement. The watercourses were classed as either straight sinuous, meandering or navigable rivers and the majority are in poor/fairly poor condition apart from a section of Mill Brook which is classed as moderate condition. Watercourses within the Onshore Order Limits are therefore of local importance (except for those parts of watercourses that are subject to statutory designations).
Ditches	There is 32.411 km of ditches within 150 m of the Onshore Order Limits plus 29.38 km within the Onshore Order Limits. There is therefore a total length of diches of 61.79 km within the onshore ecology survey area (as defined in **section 3.4.3**), of which approximately 47.6% is within the Onshore Order Limits. The ditch habitat within the Onshore Order Limits comprises: • standing water 0.479 km; • standing water – eutrophic 4.998 km; • dry ditch 18.396 km; • unspecified ditch 5.507 km. Although ditches were found to be predominantly dry, there are also wet ditches in which common reed *Phragmites australis* is often dominant, but some are of value in terms of plant species composition, habitat structure and potential value for invertebrates. In such cases, additional species include frequent hemlock water dropwort *Oenanthe croca*ta, occasional soft rush *Juncus effusus,* reed canary-grass *Phalaris arundinacea* and common reedmace *Typha latifolia*. There are also areas of dense scrub and scattered mature willow *Salix spp*., hawthorn *Crataegus monogyna* and sycamore. Where ditches occur in areas of coastal and floodplain grazing marsh priority habitat they are considered to be of up to county importance because of its connectivity with a range of riparian, wetland and coastal habitats but this priority habitat type is not a reason for selection of BHS. Other ditches are of considered to be of local or negligible importance.

Table 3.15: Summary of species survey findings

Species/habitat	Summary of key results
Badger	One potential outlying badger sett has been recorded in the badger survey area and there is more widespread evidence of badger including paths, feeding signs and hair. Three additional badger setts were recorded outside of the survey area. The potential outlying badger sett was identified within the Onshore Order Limits, which appears disused due to the overgrown nature of the surrounding vegetation. Badger is not a species of principal importance or a reason for designation of BHS and populations present are of local importance.
Bats	Two confirmed bat roosts were identified during surveys: a noctule hibernation and day tree roost (same tree) located approximately 69 m outside the Onshore Order Limits, south east of Penwortham National Grid Substation; and a Daubenton's maternity tree roost located approximately 270 m outside the Onshore Order Limits, on the eastern edge of Freckleton. These species are widespread in many parts of northern England but not abundant in all areas. At least seven bat species were recorded during bat activity surveys. These were: • common pipistrelle, soprano pipistrelle and brown long-eared bat, which are widespread throughout northern England; • *Myotis* species and noctule, which are widespread in many places but not as abundant; and • Leisler's bat *Nyctalus leisleri*, and Nathusius' pipistrelle, which are rarer/have a more restricted distribution in northern England. Noctule, soprano pipistrelle and brown long-eared bat are species of principal importance. Leisler's bat was recorded at 24 of 26 locations within the survey area and Nathusius' pipistrelle was recorded at 20 locations across the survey area. Both are therefore considered present throughout the survey area. At least three species of bat were recorded at every survey location, including common pipistrelle and *Myotis sp*. Relatively high bat diversity of more than five of the seven species or species groups recorded was present at 12 of the 26 locations. The highest average number of bats per night across all periods and species, with an average of 2846.37 identifications per night was located inside the Onshore Order Limits at Morgan onshore substation. The bat assemblage recorded within and within the Onshore Order Limits and a 150 m buffer is of county importance, due to the presence of confirmed roosts, in accordance with BHS selection criteria, and because species that are rarer or have a more restricted distribution in northern England were recorded.
GCN and other amphibians	Sixty-one waterbodies within the onshore ecology survey area (as defined in **section 3.4.3**) for GCN were subject to habitat suitability indices assessment in 2022 and 2024. A further 37 outside of the survey area, which provide contextual information, were assessed in 2022. The following results were obtained within the survey area: • Excellent 2 (3.28%) • Good 18 (29.51%) • Average 17 (27.87%) • Below average 9 (14.75%)

Species/habitat	Summary of key results
	• Poor 15 (24.59%) The results of the surveys beyond the survey area are broadly similar, with the greatest variation in the 'good' habitat suitability index category. Environmental DNA (eDNA) surveys were caried out in 43 waterbodies in the survey area for GCN in 2022 and 2024, in which GCN were present in seven (16.28%) ponds, all in 2024, and absent in 36 (83.72%) of the waterbodies. GCN were present in three of the 15 ponds surveyed beyond the survey area. This is contextual data. Incidental records, predominantly from reptile surveys, show that common toad were present in low numbers at six survey locations. In combination with the review of desk study records provided in **section 3.6.1**, this is considered to indicate the presence of populations of local importance, but surveys to establish presence and population size of common toad have not been carried out.
Reptiles	Twelve areas were identified as having potential requirement for reptile surveys. Of these, three areas within the onshore ecology survey area (as defined in **section 3.4.3**) were descoped in 2024 with no further requirement for survey, based on habitat suitability. Five areas within the onshore ecology survey area were subject to surveys. No reptiles have been recorded during the surveys. Reptiles are of **negligible importance.**
Otter	A range of evidence of otter comprising six holts, nine potential holts, three couches, one hover and one resting site were recorded within the onshore ecology survey area (as defined in **section 3.4.3**). A further one holt, 10 potential holts and one potential resting site were recorded at a greater distance and provide context for the wider area. Concentrations of activity have been recorded in and near the eastern part of the onshore ecology survey area at Savick Brook and Mill Brook that flow into the River Ribble from the north and south respectively. These watercourses and associated habitat, including Lea Marsh BHS, form the home range and territory of a breeding population of otter that is of county importance in accordance with BHS selection criteria, and because otter is fully protected and is a species of principal importance. Evidence of otter was recorded in lower concentrations in and near the western part of the onshore ecology survey area, generally with sporadic evidence, with the exception of a watercourse near Higher Ballam where a greater density and range of otter signs, including resting sites and a potential holt, were recorded.
Water vole	Ninety-one watercourses and 39 waterbodies have been subject to detailed water vole surveys. Surveys have provided scattered and unconfirmed evidence of water vole, predominantly in the form of mammal burrows, that is most frequent in the western part of the onshore ecology survey area (as defined in **section 3.4.3**), at Lytham Moss to the east of Queensway, and in the eastern part of the survey area to the south and east of the existing National Grid Penwortham substation. Limited additional signs of water vole presence have been found in conjunction with the potential burrows. Only one instance of an unconfirmed burrow and other field signs (feeding remains) were recorded immediately east of Howick Cross Lane, and approximately 6 m from the Onshore Order Limits at its closest point. There is infrequent but widespread evidence of mink *Neogale vison*, which is a significant predator of water vole, in and near the survey area. Water vole surveys have been carried out with the understanding that the Ribble Estuary SSSI and NNR is considered to be a stronghold for water vole, and all accessible areas in and in the vicinity of the SSSI and NNR were surveyed to establish the current status of the population. Survey data indicates that the population has declined, potentially due to the presence of mink, as there is very

Species/habitat	Summary of key results
	little confirmed evidence of water vole. The feeding remains and a nearby unconfirmed burrow near Penwortham indicate transient presence of water vole rather than an established population. The absence of signs such as droppings, prints and lawns could suggest an absence of very low populations of water voles across the majority of the survey area. Water vole are therefore considered to be of local importance.
Fish	Flounder *Platichthys flesus*, three spined stickleback *Gasterosteus aculeatus*, European eel, roach *Rutilus rutilus*, dace *Leuciscus leuciscus* and chub *Leuciscus cephalus* were recorded during fish surveys. With the exception of European eel, which is critically endangered, all are of 'least concern' according to IUCN criteria. Five European eel were present in three watercourses were recorded during the surveys, but no salmonids, lampreys or other notable species were recorded. Issues that may contribute to low fish diversity include disturbance, isolation, turbidity and poor water quality. Fish are of therefore of local importance.
Aquatic invertebrates (ponds and watercourses)	In total 11 different invertebrate groups were recorded during the aquatic invertebrate surveys of waterbodies. The groups comprised alderfly larvae, dragonfly larvae, damselfly larvae, water beetles, water bugs, pond skaters, mayfly larvae, freshwater shrimps, water skaters, water snails and species such as leeches and worms. Five waterbodies were scoped in for rapid assessment survey and 26 were scoped out. A diverse assemblage of aquatic invertebrates was recorded within three of the waterbodies during scoping surveys, and two more were scoped in further survey due to their classification as BHS: • Northeast of Woodside Farm, to the south of Moss Side, for which water quality was good, and a diverse assemblage of invertebrate 44 taxa and emergent macrophytes included water crowfoot *Ranunculus aquatilus* were recorded. It is partially within the land required for the construction of the onshore export cable. • Northeast of Freckleton, for which there was some trampling by livestock but the pond retained some aquatic vegetation. An assemblage of 42 invertebrate taxa was recorded. The pond is adjacent to the Onshore Order Limits where land is required for the construction of the Morecambe onshore substation, though this pond lies outside of the Onshore Order Limits. • East of Newton with Scales, for comparatively deep water and well-developed marginal vegetation, and a large number of dragonflies and damselflies were recorded. An assemblage of 32 invertebrate taxa was recorded. The pond is in land permanently required for the Morgan onshore substation. • East of Newton with Scales which is Freshfield Pond North BHS, recorded as now being in poor condition, completely lacking macrophytes with a substrate of woody debris, leaf litter and silt. An assemblage of nine invertebrate taxa was recorded. The pond is in land permanently required for the Morgan onshore substation. • East of Newton with Scales which is Freshfield Pond South BHS, formerly a marlpit, supporting a bog community and a diverse range of aquatic plants. Mud pond snail *Lymnaea glabra* (a Red Data Book species that requires shallow acid pools), nationally scarce water beetle *Ilybius guttiger* and the moss bladder snail *Aplexa hypnorum* (a species of restricted occurrence) were recorded alongside a number of other invertebrates such as diving and scavenger beetles. The pond is in land permanently required for the Morgan onshore substation. All these ponds are considered to be of county importance because they potentially meet BHS criteria for ponds or are currently designated as BHS.

Species/habitat	Summary of key results
	Eight watercourses were confirmed to be suitable for protected or notable aquatic invertebrates and were scoped in for more detailed rapid assessment surveys. In total 17 different aquatic invertebrate families were recorded during the aquatic invertebrate surveys of these watercourses: leeches, shrimps, water fleas, water louse, limpets, true bugs, stoneflies and true flies. No species of conservation concern were recorded so species were only recorded to family level. All eight watercourses supported aquatic invertebrate families with higher sensitivity to pollution (a BMWP score of five and above). These families were shrimp, water boatmen and diving beetles. Watercourse B (Main Drain) was the only watercourse to not support these species. The diversity of the aquatic invertebrate assemblage was lower in watercourse H (Unnamed watercourse 3) with only one family recorded, indicating poorer water quality. All watercourses contained assemblages indicative of poor biological quality and they are of local importance.
Terrestrial invertebrate	Fifteen sites were subject to a terrestrial invertebrate survey. Of these, two sites within the survey area were scoped in for detailed terrestrial invertebrate surveys, comprising: • sheep grazed pasture with river margin and pond margin wetlands of value for invertebrates at which 53 and 51 different species were recorded during two visits; and • saltmarsh at Lea Marsh BHS with high potential for scarce/rare invertebrates present at which 245 different species were recorded. Of these species, 65 of which were listed with a conservation status of least concern, which indicates widespread and generally common species, with no current conservation importance. The following notable species were recoded: • alder leaf beetle *Agelastica alni* is Data Deficient and Nationally Rare, at one location within the onshore ecology survey area (as defined in **section 3.4.3**) and three at a greater distance (as contextual data); • speckled wood butterfly *Pararge aegeria* which is a Lancashire key species and was recorded at one location as contextual data; and • a ground beetle *Bembidion maritimum* and two shorebugs *Salda littoralis* and *Saldula palustris,* all of which are Nationally Scarce were recorded in the survey area at Lea Marsh BHS. Analysis of the dataset showed that six specific assemblage types are present, of which four are associated with open habitats, one with heartwood decay and one with bark and sapwood decay. None qualify as being in favourable conservation status condition as insufficient qualifying species were recorded. None of the sites, or populations or assemblages species recorded meet criteria for BHS, invertebrates are not a reason for designation of Lea Marsh BHS. The three sites are therefore each of local importance.
INNS	The desk study and incidental records of Schedule 9 INNS have indicated that the following species will require consideration in the Outline Biosecurity Protocol (document reference J1.12) and, where appropriate, wider control programmes and the Outline Ecological Management Plan (document reference J6). • Himalayan balsam – several records of this species occurred, particularly in the watercourse and ditch network in the vicinity of the Morgan onshore substation, and in Savick Brook and watercourses in the vicinity of or within Lea Marsh and the proposed mitigation and biodiversity benefit areas (Lea Marsh BHS and Lea Marsh fields).

Species/habitat	Summary of key results
	• Japanese knotweed – records include one from the area of arable land identified for habitat creation for biodiversity benefit (Lea Marsh fields). • New Zealand pigmyweed – record obtained close to the onshore export cable corridor in one location. • Japanese rose – occasional record of species recorded during surveys. • American mink *Neogale vison* – recorded during otter surveys.
White-clawed crayfish	One site was scoped in for white-clawed crayfish eDNA surveys. This site returned a negative result, confirming likely absence. No further habitat suitable for white-clawed crayfish was found following further Phase 1 habitat survey undertaken since the PEIR and consequently no further surveys have been carried out. No records of white-clawed crayfish were returned during the desk study search. White-clawed crayfish are therefore of **negligible importance**.

3.6.3 Future baseline conditions

3.6.3.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require that '*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge'* is included within the ES. This section provides an outline of the likely future baseline conditions in the absence of the Transmission Assets.

3.6.3.2 It is anticipated that in the absence of the Transmission Assets, intensive farming and other land uses within the study area would continue and would remain broadly similar to those that currently take place. It is also expected that the ongoing management of sites of ecological importance would, in many cases, sustain the current trend towards favourable condition of these sites, which is apparent from generally the improving condition of SSSI and the activities of local authorities and the voluntary sector to protect and restore coastal habitats. More broadly and at a larger scale, changes in environmental policy and legislation, including the 25 Year Environment Plan (Defra, 2018) and the Environment Act put emphasis on nature recovery outside of the designated site network. They place new duties on public bodies and developers and incentivise land managers to deliver biodiversity gains. Related measures include biodiversity benefit as discussed in **section 3.2.5** and continuation of the transition from Common Agricultural Policy to Environmental Land Management schemes. Both will result in changes in nature of development and land management in the study area.

3.6.3.3 Climate projections relevant to the Transmission Assets for the period 2040-2069 predict a 0.69-3.27 ^{o}C rise in temperature in summer and a 0.39-2.58 ^{o}C rise in winter temperature assuming high emissions. Between a 1.85-6.52 ^{o}C (summer) and 0.88-4.59 ^{o}C (winter) rise is predicted by the end of the century (2070-2099). The relationship between climate change and biodiversity in the UK has been considered by the Inter-Agency Climate Change Forum (IACCF, 2010). They have found that the impact on species of increased temperatures can include changes in distribution and abundances, timing of seasonal events and the timing of when habitats are used. As a result, the overall species composition, habitats and ecosystem characteristics are expected to change in response to changes in climatic conditions. There is potential risk in particular to coastal freshwater and wetland habitats due to changes in sea levels and rainfall patterns. The broad characteristics of farmland habitats, which are dominated by arable and improved grassland with hedges and small woodlands are likely to be relatively resilient to climate change. By contrast coastal habitats, such as saltmarsh, sand dunes and grazing marsh but may be impacted by the approximately 1 m sea level rise is projected for UK by end of century. The quality, distribution and permanence of ponds and minor watercourses may change due to changes in rainfall and higher temperatures. Associated species, such as amphibians and wetland plants and invertebrates may decline.

3.6.3.4 The prevalence of new pests and pathogens, partly linked to climate change, is a further cause of change that is likely to influence the future ecological baseline. Ash trees, which are a major component of the trees and woodland in the study area have been significantly affected by the air-borne fungus disease ash dieback. This will change the composition of tree species in the study area, as well as in associated species, most notably bats and invertebrates. This will be taken into account in the recommendations for landscape and biodiversity planting at the onshore substation sites.

3.6.4 Important Ecological Features

3.6.4.1 In accordance with the CIEEM guidelines on ecological impact assessment (CIEEM, 2018), IEFs have been identified based on the findings of the desk study and site survey work undertaken.

3.6.4.2 IEFs are sites, habitats or species of ecological value identified through consultation, the desk study and field surveys, where any potential impact as a result of the construction, operation and maintenance or decommissioning of the Transmission Assets has the potential to give rise to a significant effect.

3.6.4.3 For the purposes of this assessment, sites, habitats, and species populations and assemblages have been valued using the following scale, in accordance with definitions provided in **Table 3.16**:

- international;
- national (England);
- regional (North West England);
- county;
- local; and
- negligible.

3.6.4.4 Sites, habitats, or species are considered to be IEFs if they meet at least the county level of importance. It is considered that only under exceptional circumstances would impacts on features of less than county level importance give rise to significant effects.

3.6.4.5 The valuation of sites also takes account of existing value systems such as SSSI and BHS designations. Professional judgement has been used for the valuation of sites of less than county value.

3.6.4.6 Species are valued on the basis of their recognised status (such as those that are legally protected, threatened, of principal importance or a consideration for designations), as well as other attributes such as rarity, distribution, population size and the diversity and distinctiveness of the assemblage of which they are part.

3.6.4.7 Due regard has been paid to the legal protection afforded to protected species in the development of mitigation measures and commitments. For fully protected species there is a requirement that a project should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

3.6.4.8 While it is necessary to take account the of any legal protection to which a species is subject, this does not determine its ecological importance for the purposes of this assessment. For example, whilst GCN receive full legal protection under UK and EU legislation, this does not mean that GCN are internationally important. It is necessary to consider the particular population in context of the attributes listed above, and the geographic scale at which they are important.

3.6.4.9 Compliance with applicable wildlife legislation for sites, habitats and species, which is summarised **section 3.2.1** will be implemented though measures contained in the Outline Code of Construction Practice (CoCP) (document reference J1), Outline Ecological Management Plan (document reference J6) and obtaining mitigation licences.

Table 3.16: Definition of conservation importance of the receptor

Conservation importance	Definition
International or European	European sites including SACs, candidate SACs and SCIs. Areas of habitat or populations of species which meet the published selection criteria based on discussions with Natural England and field data collected to inform the ES for designation as a SAC, but which are not themselves currently designated at this level. Large areas of priority habitats listed in Annex 1 of the Habitats Directive and smaller areas that are essential to maintain the viability of that ecological resource.
National	A nationally designated site including SSSIs and NNRs. Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected, and in agreement with Natural England. Areas of ancient woodland e.g., woodland listed within the Ancient Woodland Inventory.
Regional	Populations of species of principal importance will be of regional importance in the context of published information on population size and distribution. Large areas of priority habitats, which are important in a regional context.
County	LNR and non-statutory designated sites (BHS in the context of the study area). Areas of habitat, and populations and assemblages of species which, based on field data collected to inform the ES meet the published selection criteria for those sites listed above but which are not themselves designated.
Local	Common and widespread semi-natural habitats occurring in proportions greater than may be expected in the local context. Populations and assemblages of species that, based on their extent, population size, quality etc, are determined to be at a lesser level of importance than the geographic contexts above.
Negligible	Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area. Areas of heavily modified or managed land uses (e.g., hard standing used for car parking, as roads etc).

3.6.4.10 Based on the information presented in **Table 3.16** and the criteria described in this section, **Table 3.17** identifies the IEFs that have been taken forward for assessment.

Table 3.17: IEFs taken forward into the assessment

Receptor	Description	Importance
Ribble and Alt Estuaries Ramsar site	Ribble and Alt Estuaries Ramsar site: Ramsar criteria includes the presence of natterjack toad.	International
Ribble Estuary SSSI, NNR:	The interest features of the SSSI relevant to onshore ecology and nature conservation are lowland neutral grassland and saltmarsh.	National
Lytham St Annes Dunes SSSI	Features of the SSSI include various sand dune habitats, and populations and assemblages of uncommon plants and invertebrates.	National
Lytham St Annes LNR	The LNR is designated for species rich sand dunes as per the reason for designation of Lytham St. Annes Dunes SSSI which it is within.	County
BHSs	Thirteen BHS are present in the Onshore Order Limits, as listed in **Table 3.9**: They are designated for a range of woodland, grassland, coastal and wetland habitats and support notable populations and assemblages of plants, invertebrates, birds, amphibians and reptiles.	County
Ecological networks	The woodland and grassland networks form part of the spatial basis for the emerging Local Nature Recovery Strategies for Lancashire.	County
Ancient woodland	Booth's Plantation BHS on the south slope of Mill Brook Valley is described as having characteristics of ancient semi-natural woodland. However, the site is not listed on the Ancient Woodland Inventory.	National
Veteran tree irreplaceable habitat	A single veteran tree of unknown species, identified on the Ancient Tree Inventory is located within the Onshore Order Limits. A veteran pedunculate oak tree close to Howick Cross Lane was identified during arboricultural surveys	County
Priority habitat	Coastal and floodplain grazing marsh priority habitat.	Up to county
	Coastal saltmarsh priority habitat (forming a reason for designation of SSSI and BHS that are within the Onshore Order Limits).	National, county
	Coastal sand dunes priority habitat (forming a reason for designation of SSSI and BHS that are within the Onshore Order Limits).	National, county

Receptor	Description	Importance
	Inter-tidal mudflats priority habitat (forming a reason for designation of SSSI within the Onshore Order Limits).	National
	Purple moor-grass and rush pasture priority habitat.	Up to county
	Ponds priority habitat.	County
	Hedgerows priority habitat.	County
Bats	The bat assemblage recorded within the bat study area is of county importance, due to the presence of a regularly used confirmed roosts, in accordance with BHS selection criteria, and because species that are rarer or have a more restricted distribution in northern England were recorded.	County
GCN	Two populations or metapopulations assumed to be of a 'good' size class according to BHS criteria have been recorded and are of county importance in each case.	County
Reptiles (sand lizard)	There is an introduced population sand lizard at the Ribble Estuary SSSI and Lytham St Annes Dunes SSSI. This species is not a reason for BHS selection but the population is part of a recognised reintroduction program that is understood to have been carried out to extend the range of sand lizard in Merseyside to the north of the Ribble Estuary.	Regional
Otter	Watercourses and associated habitats on both sites of the River Ribble within the otter survey area forms the home range, territory of a breeding population that is of county importance.	County
Fish assemblage in the River Ribble	There are infrequent records for protected and notable species, which are for Atlantic salmon, brown/sea trout, European eel, river lamprey and smelt between 2004 and 2016, which are all species of conservation concern. The River Ribble is understood to be strategically significant in the partial recovery of salmon in other rivers in north west England.	Regional
Aquatic invertebrates as part of BHS designation	The presence of notable assemblages of aquatic invertebrates are a reasons for designation of BHS including Freshfield Farm Pond, North Freshfield Farm Pond, South Howick Hall Ponds Westby Clay Pit.	County

Receptor	Description	Importance
Terrestrial Invertebrates as part of SSSI and BHS designation	The presence of notable assemblages of terrestrial invertebrates are reasons for designation of Lytham St. Annes Dunes SSSI and Lytham Foreshore Dunes and Saltmarsh BHS.	National/county
Plants as part of SSSI and BHS designations	The presence of notable assemblages of plants are reasons for designation of Lytham St. Annes Dunes SSSI and Lytham Foreshore Dunes and Saltmarsh BHS and River Ribble, Lower Tidal Section BHS.	National/county

3.6.4.11 Surveys undertaken by the Applicants have provided scattered and unconfirmed evidence of water vole, predominantly in the form of mammal burrows (see Volume 3, Annex 3.9: Water vole technical report). There is infrequent but widespread evidence of mink *Neogale vison*, which is a significant predator of water vole, in and near the survey area.

3.6.4.12 Water vole surveys have been carried out with the understanding that the Ribble Estuary SSSI and NNR is considered to be a stronghold for water vole, and all accessible areas in and in the vicinity of the SSSI and NNR were surveyed to establish the current status of the population. Survey data indicates that the population has declined, potentially due to the presence of mink, as there is no confirmed evidence of water vole. The feeding remains and a nearby unconfirmed burrow near Penwortham indicate the transient presence of water vole rather than an established population. Water vole are therefore considered to be of local importance and have not been taken forward as an IEF for assessment. Preconstruction surveys, precautionary methods of working and application for a mitigation licence will be carried out as required to ensure compliance with applicable legislation.

3.7 Scope of the assessment

3.7.1.1 The scope of the ES has been developed in consultation with relevant statutory and non-statutory consultees as detailed in **Table 3.5**.

3.7.1.2 Taking into account the scoping and consultation process, **Table 3.18** summarises the impacts considered as part of this assessment.

Table 3.18: Impacts considered within this assessment

Activity	Potential effects scoped into the assessment
Construction and decommissioning phase	
Construction and decommissioning within landfall.	• Effects due to temporary and permanent habitat loss and the potential for killing/injury of species associated with construction and decommissioning activities, including open cut trenching and use of trenchless techniques. • Effects due to habitat fragmentation, species isolation and disturbance (e.g., light and noise pollution, changes to water availability) associated with construction and decommissioning activities including the open cut trenching and trenchless technique. • Effects due to pollution caused by accidental spills/contaminant release or impact of spreading INNS that may be associated with construction and decommissioning activities, including open cut trenching and trenchless techniques. • Effects due to changes in air quality (including dust) and deposition of pollutants associated with increases in vehicle movements for construction.
Construction and decommissioning along the onshore export cable corridor and the 400 kV grid connection cable corridor.	
Construction and decommissioning of the onshore substations.	
Operation and maintenance phase	
Operation of the landfall, onshore substations, onshore export cable corridor and the 400 kV grid connection cable corridor.	• Effects due to species isolation and disturbance associated with operation and maintenance activities of the onshore substations, onshore export cable corridor (including landfall) and the 400 kV grid connection cable corridor.

3.7.1.3 Impacts that are not likely to result in significant effects have been scoped out of the assessment. A summary of the impacts scoped out, together with justification for scoping them out and whether the approach has been agreed with key stakeholders through either scoping or consultation, is presented in **Table 3.19**.

Table 3.19: Impacts scoped out of the assessment

Impact	Justification
The impact of temporary and permanent habitat loss on protected habitats and species during operation and maintenance of the onshore elements of the Transmission Assets.	Activities associated with the operation and maintenance of the onshore elements of the Transmission Assets will require no additional land take and are unlikely to result in any temporary or permanent loss of habitat (see Volume 1, Chapter 3: Project Description). Therefore, the potential impact on protected habitats and species arising from the temporary and permanent habitat loss during operation and maintenance of the onshore elements of the Transmission Assets is unlikely to result in significant effects and has been scoped out of the assessment for onshore ecology. The Planning Inspectorate confirmed that it is content with this approach through the Scoping Opinion.
The impact of pollution caused by accidental spills/contaminant release on protected habitats and species during operation and maintenance of the onshore elements of the Transmission Assets.	Activities associated with the operation and maintenance of the onshore elements of the Transmission Assets are unlikely to result in accidental spills/contaminant release (see Volume 1, Chapter 3: Project Description). Notwithstanding this, best practice measures to be incorporated into the Ecological Management Plan would include measures to avoid or minimise the likelihood and the degree of impact of any

Impact	Justification
	accidental pollution event during construction. An Outline Ecological Management Plan is provided as part of the application (document reference J6). This commitment is detailed in **section 3.8** and in Volume 1, Annex 5.3: Commitments register of the ES. Therefore, the potential impact of pollution on protected habitats and species arising from accidental spills/contaminant release during operation and maintenance of the onshore elements of the Transmission Assets is unlikely to result in significant effects and has been scoped out of the assessment for onshore ecology. The Planning Inspectorate confirmed that it is content with this approach through the Scoping Opinion.

3.8 Measures adopted as part of the Transmission Assets (commitments)

3.8.1.1 For the purposes of the EIA process, the term 'measures adopted as part of the Transmission Assets' is used to include the following two types of mitigation measures (adapted from Institute for Environmental Management and Assessment (IEMA), 2016). These measures are set out in Volume 1, Annex 5.3: Commitments Register of the ES.

- Embedded mitigation. This includes the following.
  - Primary (inherent) mitigation - measures included as part of the project design. IEMA describes these as 'modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken'. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and/or marine licences. For example, a reduction in footprint or height.
  - Tertiary (inexorable) mitigation. IEMA describes these as '*actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects*'. It may be helpful to secure such measures through a Code of Construction Practice or similar.
- Secondary (foreseeable) mitigation. IEMA describes these as '*actions that will require further activity in order to achieve the anticipated outcome'*. These include measures required to reduce the significance of environmental effects (such as lighting limits) and may be secured through an environmental management plan.

3.8.1.2 In addition, where relevant, measures have been identified that may result in enhancement of environmental conditions. Such measures are clearly identified within Volume 1, Annex 5.3: Commitments Register of the ES. The measures relevant to this chapter are summarised in **Table 3.20**.

3.8.1.3 Embedded measures that will form part of the final design (and/or are established legislative requirements/good practice) have been taken into account as part of the initial assessment presented in **section 3.11** below (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures to which the Applicants are committed are taken into account in the assessment of effects.

3.8.1.4 Where an assessment identifies likely significant adverse effects, further or secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by IEMA as actions that will require further activity in order to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES (referred to as secondary mitigation measures in IEMA, 2016). For further or secondary measures both pre-mitigation and residual effects are presented.

Table 3.20: Measures (commitments) adopted as part of the Transmission Assets

Commitment number	Measure adopted	How the measure will be secured
Embedded measures		
CoT02	The following features will be crossed by trenchless techniques, as set out in the Onshore Crossing Schedule submitted as part of the application for development consent: • A, B and Classified unnumbered roads (known as C roads) (including the Preston Western Distributor Road, A582 South Ribble Western Distributor Upgrade and M55 Heyhouses Link Road; excluding Leech Lane); • All Environment Agency Main Rivers, including: Moss Sluice, east of Midgeland Road along Pegs Lane; Savick Brook, south of A583; Wrea Brook southeast of Cartmell Lane; Dow Brook east of Lower Lane between the A584 and the A583; Middle Pool north of Lund Way; and • All Network Rail crossings, including along the line which runs between Blackpool North and Preston, south of Cartmell Lane; and at the Network Rail crossing along the line which runs to Blackpool North, south east of Squires Gate, parallel to the A584.	DCO Schedules 2A & 2B, Requirement 5(2) (Detailed design parameters onshore); DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT03	A range of sensitive historical, cultural and ecological conservation areas (including statutory and non-statutory designations) have been directly avoided where practicable during the site selection process for Morgan and Morecambe Offshore Wind Farms: Transmission Assets footprint. The Works Plans identify the areas where different works are currently proposed. These include, but are not restricted to: • Listed Buildings • Scheduled Monuments • Registered Parks and Gardens • Onshore Conservation Areas • Onshore National Site Network • Offshore National Site Network • Sites of Special Scientific Interest (Onshore only) • Local Nature Reserves • Local Wildlife sites	DCO Article 3(1); Works Plans - Onshore and Intertidal

Commitment number	Measure adopted	How the measure will be secured
	• Lancashire Wildlife Trust Reserves • Royal Society for the Protection of Birds (RSPB) Reserves • National Trust land; • Ancient Woodland sites and known Tree Preservation Orders (TPOs); & • non-designated built heritage assets. Where possible, unprotected areas of woodland, mature and protected trees (i.e. veteran trees) have and will also be avoided, including the veteran tree located to the north east of National Grid Penwortham substation.	
CoT04	An Outline Pollution Prevention Plan (PPP) forms part of the Outline Code of Construction Practice submitted with the application for development consent. Detailed PPP(s) will be developed in accordance with the Outline PPP and includes details of emergency spill procedures. Good practice guidance detailed in the Environment Agency's Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice).
CoT06	The construction area associated with onshore export cable corridor will be 100 m working width and the 400kv grid connection cable corridor will be working width 76 m to minimise the construction footprint, except at complex trenchless technique crossings, including, but not limited to: • Network Railway Crossings; • A, B and Classified unnumbered roads (known as C roads), including B5261 (Queensway); • the approach to landfall; • river and water course crossings; and • sensitive utility assets (e.g. high pressure gas pipelines). The widths of both the onshore export cable corridor and 400kv grid connection cable corridor also increases up to 270 m in width, on the access and egress to the onshore substations, to facilitate consideration of trenchless crossings as well as being subject to detailed design. These increased widths and crossing methodologies are set out in the Onshore Crossing Schedule and Works Plans-Onshore and Intertidal.	DCO Schedules 2A & 2B, Requirement 5 (Detailed design parameters onshore); Works Plans - Onshore and Intertidal
CoT08	Post-construction, the working area will be reinstated to pre-existing condition as far as reasonably practical in line with the DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (PB13298), Institute of Quarrying (IQ) Good Practice Guide for Handling Soils in Mineral Workings (IQ, 2021) and British Society of Soil Science (BSSS) Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (BSSS, 2022).	DCO Schedules 2A & 2B, Requirement 18 (Restoration of land temporarily used for construction);

Commitment number	Measure adopted	How the measure will be secured
		DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT10	Where trenchless techniques are proposed for Environment Agency Main Rivers, the following distances will be used: • 8 m from the bank of the Environment Agency Main River or landward toe of any associated flood defence structure; • 16 m from tidal Environment Agency Main Rivers or the landward toe of any flood defences, where the Main River is a sea defence structure; and • a minimum of 2 m vertical clearance will be maintained below the hard bed of all Environment Agency Main Rivers, including the landward toe of any associated flood defences. Final vertical clearance depths beneath Environment Agency Main Rivers will be identified during detailed design stage, in consultation with the Environment Agency, to ensure the export cables remain buried for the operational lifetime of the project.	"DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice); DCO Schedule 10, Part 9
CoT12	The onshore export cables and the 400 kV grid connection cables will be completely buried underground for the entire length. No overhead pylons will be installed as part of the Transmission Assets.	DCO Schedule 1, Part 1, Authorised Development
CoT13	Where hedgerows and/or trees require removal, this will be undertaken prior to topsoil removal. Sections of hedgerows and trees which are removed will be replaced using like for like hedgerow species, subject to landowner agreement.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice); and Requirement 12 (Ecological Management Plan)
CoT14	Joint bays will be completely buried, with the land above reinstated. An inspection cover will be provided on the surface for link boxes for access during operation and maintenance phase.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT16	All vegetation requiring removal will be undertaken outside of the bird breeding season. If this is not reasonably practicable, the vegetation requiring removal will be subject to a nesting bird check by a suitably qualified ecological clerk of works. If nesting birds are present, the vegetation will not be removed until the young have fledged or the nest failed.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan); and Requirement 8 (Code of Construction Practice)

Commitment number	Measure adopted	How the measure will be secured
CoT17	Where required, provision will be made for badger access in relevant construction areas, when work is not taking place in order to ensure normal movements as far as reasonably possible. Provision will be made to ensure avoiding the entrapment of any animals within relevant construction areas. Checks will be made prior to the start of any works to ensure no animals are trapped. Appropriate checks will be made as required by the ecological clerk of works.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan); and Requirement 8 (Code of Construction Practice)
CoT18	Core working hours for the construction of the intertidal and onshore works will be as follows: • Monday to Saturday: 07:00 - 19:00 hours; and • up to one hour before and after core working hours for mobilisation ("mobilisation period") i.e. 06:00 to 20:00. Activities carried out during the mobilisation period will not generate significant noise levels (such as piling, or other such noisy activities). In circumstances outside of core working practices, specific works may have to be undertaken outside the core working hours. This will include, but is not limited to, works being undertaken within and/or adjacent to Blackpool Airport and cable installation at landfall and at the River Ribble. Advance notice of such works will be given to the relevant planning authority.	DCO Schedules 2A & 2B, Requirement 14 (Construction hours)
CoT27	All temporary compounds will be removed and sites will be reinstated when construction has been completed.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice) DCO Schedules 2A & 2B, Requirement 16 (Restoration of land used temporarily for construction)
CoT28	Construction site lighting will only operate when required and will be positioned and directed to avoid unnecessary illumination to residential properties, sensitive ecological receptors and footpath users, and minimise glare to users of adjoining public highways. Construction site lighting will be designed in accordance with latest relevant available guidance and legislation and the details of the location, height, design and luminance of lighting to be used will be detailed within the Outline Construction Artificial Light Emissions Management Plan, as part of the Outline CoCP. The design of construction site lighting will accord with the details provided in the Outline Code of Construction Practice (CoT35) and Outline Ecological Management Plan (CoT76).	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice) DCO Schedules 2A & 2B, Requirement 12 (Ecological management plan)

Commitment number	Measure adopted	How the measure will be secured
CoT31	Ponds identified during the route planning and site selection process have been avoided where possible. During construction any newly identified ponds will be avoided through micro-siting of the onshore export cable corridor and 400 kV grid connection cable corridor where reasonably practicable.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan)
CoT33	An Outline Dust Management Plan (DMP) has been prepared as part of the Outline CoCP and submitted as part of the application for development consent. Detailed CoCP(s) will be developed in accordance with the Outline CoCP. The measures in the detailed DMP(s) will accord with guidance set out by the Institute of Air Quality guidance Management (IAQM, 2024) where appropriate and practicable, and will include measures for monitoring and reporting dust levels, and dust suppression and mitigation measures during construction and operation.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT44	The Project Description (Volume 1, Chapter 3 of the Environmental Statement) sets out that the installation of the offshore export cables under Lytham St Annes SSSI and the St Annes Old Links Golf Course will be undertaken by direct pipe trenchless installation technique. The exit pits associated with the direct pipe installation will be at least 100 m seaward of the western boundary of the SSSI.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT73	An Outline Biosecurity Protocol has been prepared, as part of the Outline CoCP and submitted as part of the application for development consent. Detailed CoCP(s) will be developed in accordance with the outline CoCP.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT81	An Outline Soil Management Plan has been prepared as part of the Outline CoCP and submitted as part of the application for development consent. The detailed CoCP(s) will be developed in accordance with the outline CoCP. Detailed Soil Management Plan(s) will be developed in order to characterise and manage soil materials during construction. Soil types would be determined via site-specific survey work.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT90	The Project Description (Volume 1, Chapter 3 of the Environmental Statement) sets out that the installation of the 400kV Grid Connection Cable Corridor beneath the River Ribble will be undertaken by direct pipe or micro tunnel trenchless installation techniques.	DCO Schedules 2A & 2B, Requirement 5(3)(Detailed design parameters onshore); and Requirement 8 (Code of Construction Practice)
Secondary mitigation		
CoT15	Detailed Landscape Management Plan(s) will be developed in accordance with the Outline Landscape Management Plan. Detailed Landscape Management Plan(s) will include details of mitigation planting at the onshore substation sites, including the number, location, species and details of management and	DCO Schedules 2A & 2B, Requirement 6 (Provision of landscaping)

Commitment number	Measure adopted	How the measure will be secured
	maintenance of planting. Where practicable, landscape mitigation planting will be established as early as reasonably practicable in the construction phase.	
CoT41	Where the onshore export cable corridor or 400 kV grid connection cable corridor crosses sites of particular sensitivity (e.g. embanked Environment Agency surface watercourses, Sites of Special Scientific Interest or groundwater inner Source Protection Zones) hydrogeological risk assessment(s) will be undertaken to inform a site-specific crossing method statement(s) where required. These will be agreed with the relevant stakeholders prior to construction.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT76	Detailed Ecological Management Plan(s) (EMP) will be developed in accordance with the Outline Ecological Management Plan (OEMP). The Outline Ecological Management Plan has been prepared and submitted as part of the application for development consent and includes but is not limited to pre-construction, construction and post-construction mitigation measures relating to habitats and protected or notable species, species mitigation licences and the role of the Ecological Clerk of Works (ECoW) where relevant. The Outline Ecological Management Plan also includes a Breeding Bird Protection Plan which will set out mitigation measures such as vegetation clearance in winter (e.g., hedgerows), pre-construction breeding bird survey, appropriate protection zones upon confirmation of nest building/breeding taking place of key protected or sensitive species. In addition to the Breeding Bird Protection Plan, the OEMP sets out species-specific mitigation plans for Important Ecological Features identified as part of the assessment. Detailed Ecological Management Plan(s) will include details of any long term mitigation and management measures relevant to onshore ecology and nature conservation and in relation to onshore and intertidal ornithology. This will include the management of ecological mitigation areas. The Detailed EMPs will be developed in consultation with the relevant statutory advisors and regulators.	DCO Schedules 2A & 2B, Requirement 12 (Ecological management plan)
CoT92	The Applicants will join the Lancashire District Level Licensing scheme in relation to Great Crested Newts, as detailed within the Outline Ecological Management Plan.	DCO Schedules 2A & 2B, Requirement 12 (Ecological management plan)
CoT122	The Outline Ecological Management Plan will include details of proposed mitigation measures associated with the direct loss of any ponds within the Transmission Assets Order Limits. Replacement habitat will be provided for ponds considered to be of higher ecological value (e.g. of sufficient conservation interest to support communities of aquatic invertebrates, such as those ponds currently located within the permanent Morgan onshore substation area). Detailed Ecological Management Plan(s) will be developed in accordance with the Outline Ecological Management Plan.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan)

Commitment number	Measure adopted	How the measure will be secured
CoT126	To mitigate for potential temporary habitat loss associated with Mill Brook Valley Bioloigical Heritage Site, temporary construction compounds will be micro-sited to avoid the site wherever reasonably practicable.	DCO Schedules 2A & 2B, Requirement 8 (Code of Construction Practice)
CoT127	To mitigate for potential disturbance to otters associated with the installation of onshore export cable corridors, a mitigation area in the home range of otter populations will be provided east of Savick Brook. Measures within these areas may include artificial holts and improvement of reed bed habitats. This is detailed within the Outline Ecological Management Plan. The final measures will be developed and agreed with the relevant stakeholders as a part of the detailed Ecological Management Plan(s) prior to construction.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan)
CoT128	At detailed design stage, hydrogeological risk assessment(s) will be undertaken in relation to the crossing of Lytham St Annes SSSI to mitigate potential impacts to the hydrologically dependant surface water features of the sand dune system. The hydrogeological risk assessment(s) will be informed by ground investigation information, where necessary and practicable. These assessment(s) will used to inform the detailed site specific crossing design for the installation of the offshore export cables beneath Lytham St Annes SSSI.	DCO Schedules 2A & 2B, Requirement 12 (Ecological Management Plan)

3.9 Key parameters for assessment

3.9.1 Maximum design scenario

3.9.1.1 The MDSs identified in **Table 3.21** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description of the ES. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g., different infrastructure layout), to that assessed here be taken forward in the final design.

3.9.1.2 The MDSs in **Table 3.21** and assessed within **section 3.11** consider the relevant construction scenario (i.e. sequential or concurrent) that equate to the MDS for that impact pathway. For example, for temporary habitat loss/disturbance the MDS is for the sequential construction scenario (i.e. construction will take place over a maximum of 66 months, noting that there is potential for a gap between the construction periods for Morgan and Morecambe as this equates to the greatest time over which impacts to ecological receptors may occur.

Table 3.21: Maximum design scenario considered for the assessment of impacts

Impact	Phase *			Maximum design scenario	Justification
	C	O	D		
The impact of temporary and permanent habitat loss.	✓	x	✓	**Construction phase: Landfall** The offshore export cables between the transition joint bay working area within Blackpool Airport and the beach will be installed using the direct pipe trenchless technique for a maximum length of 1,500 m. It is anticipated the direct pipe exit will be 100 m from the boundary of Lytham St Annes Dunes SSSI. • Entry pits for the direct pipe will be situated within the transition joint bay area within Blackpool Airport: The maximum number of entry pits will be six, with a maximum direct drill entry pit area of 450 m^2 per circuit with a depth of 6 m. The total duration of entry pit works which is included within the overall transition joint bay construction works is 29 months assuming a sequential construction scenario. • Exit pits on the beach: The maximum number of exit pits will be six, with a maximum area of drill exit pit of 875 m^2 per circuit, with a depth of 3 m. The maximum cofferdam area dimensions per pit is 75 m^2 (15 m x5 m). The total duration of exit pit works on the beach is 2 weeks per circuit. • For the offshore export cable installation between exit pits and MLWS, the burial at the of the offshore export cables seaward of the direct pipe exit pits will via open trenching. The maximum number of trenches will be six. The maximum width of the stepped trench is 10 m at the top and 3 m at the bottom and are each 3 m deep. The maximum length per trench is 300 m with a maximum working area each side of the trench of 25 m. • The open trench will transition to a beach trencher, this will be 3 m wide and up to 1,250 m long, the trench will be contained within a working corridor with a 50 m width. • Cable pull in and burial will take up to six weeks per circuit and the maximum total duration of cable pull in and burial is 36 weeks of active construction assuming a sequential construction scenario. • There will be up to four compounds required west of the transition joint bays to MLWS: – Compound 1 (welfare): 300 m^2 to be active for 36 weeks; – Compound 2: 2,500 m^2 to be active for 48 weeks; – Compound 3: 510 m^2 to be active for 48 weeks; and – Compound 4: 600 m^2 to be active for 66 months (in a sequential construction scenario).	**Construction phase** Open cut trenching in the intertidal area (and any short section above MHWS between the exit pit and MHWS) would result in the largest compound footprint and largest total area of disturbance when compared to HDD. HDD or alternative trenchless techniques will be used to install the landfall beneath the Lytham St. Annes Dunes SSSI. All major crossings, such as major roads, river and rail crossings will be undertaken using HDD or other trenchless techniques, where practicable. In terms of noise disturbance (and potentially disturbance from lighting), HDD is likely to represent the MDS, particularly if 24-hour drilling activity is required. Disturbance may also result from construction traffic using the haul road.
The impact of pollution caused by accidental spills/contaminant release.	✓	x	✓		
The impact of spreading INNS.	✓	x	✓		

Impact	Phase *			Maximum design scenario	Justification
	C	O	D		
				• There will be two transition joint bay compounds (15,000 m2 for Morgan and 11,500 m2 for Morecambe) within Blackpool Airport to facilitate construction works, to be active for up to 29 months over a 45 month period. – Maximum working area of the transition joint bay: 4,900 m^2 for Morgan and 2,800 m^2 for Morecambe **Construction phase: onshore export cables** • The maximum number of trenches will be six, with a target trench depth of 1.8 m. • Onshore export cable construction corridors width 100 m, with a length of up to 17 km. Width will include two haul roads. There will be up to 110 joint bays and 110 link boxes, with 1,000 m^3 and 8 m^3 of material excavated for each joint bay and link box respectively. • There will be up to ten construction compounds along the onshore export cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,500 m^2; – 6 type B compounds a maximum total area of 79,500 m^2; and – 2 type C compounds a maximum total area of 17,500 m2. • The maximum number of HDD locations is 120. Each major HDD location will have a compound, measuring up to 100 m x 50 m. Drilling mud will be stored and used at these compounds. **Construction phase: onshore substations** • The combined permanent footprint of the Morecambe onshore substation and Morgan onshore substation 223,500 m^2, including eight main buildings, with two access roads at 15 m width (each) and temporary substation compound. • The area of temporary compounds (combined) includes working and laydown areas (excludes permanent substation footprint) is 122,500 m^2 (additional to permanent footprint). Duration: enabling works 12 months, main construction 54 months (sequential construction scenario). **Construction phase: 400 kV grid connection cable** • Open cut trenching: The maximum number of trenches will be four, with a target trench depth of 1.8 m. The width of the permanent cable corridor is 50 m. There will be a total of 60 joint bays and 60 link boxes.	In terms of duration, the MDS is represented by sequential construction of the Morgan Offshore Wind Project Transmission Assets and the Morecambe Offshore Windfarm Transmission Assets (rather than concurrent construction), as this represents the longest overall period. The MDS is represented by the largest permanent footprint for the onshore substations, which represents the largest physical impact and greatest area of habitat loss, land disturbance and the greatest risk of spreading INNS. **Operation and maintenance phase** Regular maintenance will result in disturbance from lighting and noise from road traffic. **Decommissioning phase** Decommissioning is likely to operate within the

Impact	Phase *			Maximum design scenario	Justification
	C	O	D		
				• The working area will include a construction corridor width of 76 m (which includes two haul roads), with a length of up to 13 km. Duration of installation of up to 66 months (sequential construction scenario). • There will be a maximum of 46 HDD crossings (excluding the Ribble Estuary crossing) and the HDD compound locations will be 100 m x 50 m. • Trenchless technologies will be used to cross the River Ribble. Micro-tunnelling is considered to represent the MDS due to the depth of the entry/exit pits. The temporary compound at the launch/exit (two compounds) area would be a maximum of 75 m x 400 m. There will be a maximum of four tunnels/bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. • There will be up to eight construction compounds along the 400 kV grid connection cable corridor. During a sequential construction compounds will be present for 66 months with the following attributes: – 2 type A compounds, a maximum total area of 26,270 m2; – 4 type B compounds a maximum total area of 52,540 m2; and – 2 type C compounds a maximum total area of 17,500 m2. • Duration of installation is up to 66 months (sequential). **Operation and maintenance phase** • The onshore export cable route would be up to 17 km in length. The maximum width of the permanent cable corridor is 70 m. • The 400 kV grid connection cable route would be up to 13 km in length. The maximum width of the permanent cable corridor is 50 m. • Maintenance to the onshore export cable and the 400 kV grid connection cable will be undertaken only as required. Corrective activities will be limited. • The onshore export cable, the 400 kV grid connection cable and the onshore substations will be monitored remotely but will involve regular visits. Lighting at the onshore substations will comprise security lighting around the perimeter fence and standard car park lighting, with task related lighting where necessary.	parameters identified for construction.
The impact of disturbance.	✓	✓	✓		**Construction phase** Open cut trenching in the intertidal area (and any short section above MHWS between the exit pit and MHWS) would result in the largest compound footprint and largest total area of disturbance when compared to HDD. HDD or alternative trenchless techniques will be used to install the landfall beneath the Lytham St Annes Dunes SSSI. All major crossings, such as major roads, river and rail crossings will be undertaken using HDD or other trenchless techniques, where practicable. In terms of noise disturbance (and potentially disturbance from lighting), HDD is likely to represent the MDS, particularly if 24-hour drilling activity is required. Disturbance may also result from
The impact of construction emissions	✓	x	✓		

Impact	Phase *			Maximum design scenario	Justification
	C	O	D		
				• The combined permanent footprint of the Morecambe onshore substation and Morgan onshore substation is 223,500 m^2, including eight main buildings and areas required for attenuation ponds and landscaping. **Decommissioning phase** • Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). Onshore export cables and 400 kV grid connection cables may be recovered from the ducts for recycling but the ducts, joint bays and link boxes will only be removed if feasible and if required to return the lands to normal agricultural use. For the purposes of EIA, decommissioning of the onshore substations is assumed to be similar to the construction and in reverse sequence.	construction traffic using the haul road. In terms of duration, the MDS is represented by sequential construction of the Morgan Offshore Wind Project Transmission Assets and the Morecambe Offshore Windfarm Transmission Assets (rather than concurrent construction), as this represents the longest overall period. The MDS is represented by the largest permanent footprint for the onshore substations, which represents the largest physical impact and greatest area of habitat loss, land disturbance and the greatest risk of spreading INNS. **Operation and maintenance phase** Regular maintenance will result in disturbance from lighting and noise from road traffic. **Decommissioning phase**

Impact	Phase *			Maximum design scenario	Justification
	C	O	D		
					Decommissioning is likely to operate within the parameters identified for construction.

[a] C=construction, O=operation and maintenance, D=decommissioning

3.10 Impact assessment methodology

3.10.1 Overview

3.10.1.1 The approach to determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor (CIEEM, 2018). This section describes the criteria applied in this chapter to assign values to the magnitude of impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on relevant guidance, including the Design Manual for Roads and Bridges methodology (Highways England *et al.,* 2020) where appropriate as described in further detail in Volume 1, Chapter 5: Environmental Assessment Methodology of the ES.

3.10.2 Receptor sensitivity/value

3.10.2.1 Several factors have been taken into consideration when assessing the value of an IEF and whether it is considered important and therefore requires assessment.

3.10.2.2 In assessing the value of habitats or species populations, a subjective assessment has been made, based on a range of factors that influence overall ecological value. Amongst other factors, a series of criteria have been considered for habitats and populations of species including: rarity, extent, diversity, recoverability, position in the landscape and naturalness.

3.10.2.3 The criteria for defining sensitivity in this chapter are outlined in **Table 3.22** below.

Table 3.22: Sensitivity criteria

Sensitivity	Definition
Very High (International)	A species or internationally designated site or candidate site, such as a SAC, Biosphere Reserve or an area Natural England has determined meets the published selection criteria for such a designation, irrespective of whether or not it has yet been notified.
High (National)	A species or nationally designated site, e.g. SSSI, NNR, Marine Nature Reserves or an area which Natural England has determined meets the published selection criteria for national designation (e.g. SSSI selection guidelines irrespective of whether or not it has yet been notified).
Medium (Regional/County)	Viable areas of habitat identified in a County Biodiversity Action Plan (BAP) or designated as a BHS, a local significant population of a species identified as important on a county basis, such as a County BAP.
Low (Local)	Diverse and/or ecologically valuable habitats species not of County importance.
Low (Site)	Features of value to the immediate area only.
Negligible	Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

3.10.3 Magnitude of impact

3.10.3.1 Impacts may be described in terms of changes to the structure or function of an ecological resource and are characterised according to a number of parameters where these are relevant. These parameters include:

- beneficial or adverse – impacts may be either, depending on the nature of the impact;
- extent – the geographical range over which the impact occurs;
- magnitude – the size of the impact in terms of amount of a feature affected;
- duration and timing – when the impact would occur and how long it would last;
- frequency – whether the impact would be a single event or multiple events; and
- reversibility – the impact may be permanent, or may naturally reverse without mitigation, or may be reversible with appropriate mitigation.

3.10.3.2 The criteria for defining magnitude in this chapter are outlined in **Table 3.23** below.

Table 3.23: Magnitude of impact criteria

Magnitude of impact		Definition
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristic, feature or element; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

3.10.3.3 For the purposes of assessment habitat loss may be temporary or permanent as discussed below. The duration of temporary habitat loss is defined as

follows (as set out in Volume 1, Chapter 5: Environmental assessment methodology of the ES):

- short term: a period of months, up to one year;
- medium term: a period of more than one year, up to three years; or
- long term: a period of greater than three years.

3.10.3.4 Species will have differing responses to the impacts caused by construction of the Transmission Assets, depending on their sensitivity to different types of impact; the extent, duration and location of the impact and prevailing conditions in the wider environment. Consequently, the durations stated above are indicative and may be revised in the discussion of impacts on a particular IEF.

3.10.4 Significance of effect

3.10.4.1 The significance of the effect upon onshore ecology has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in **Table 3.24**. Where a range of significance levels is presented, the final assessment for each effect is based upon expert judgement.

3.10.4.2 In all cases, the evaluation of receptor sensitivity, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

3.10.4.3 For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 3.24: Assessment matrix

Sensitivity of Receptor	Magnitude of Impact			
	Negligible	**Low**	**Medium**	**High**
Negligible	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Minor	Minor or Moderate	Moderate or Major	Major
Very High	Minor	Moderate or Major	Major	Major

3.10.4.4 Where the magnitude of impact is ‘no change’, no effect would arise.

3.10.4.5 The definitions for significance of effect levels are described as follows.

- Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national, or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local

importance may also enter this category. Effects upon human receptors may also be attributed this level of significance.

- Moderate: These beneficial or adverse effects have the potential to be important and may influence the key decision-making process. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse or beneficial effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects are generally, but not exclusively, raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

3.10.5 Assumptions and limitations of the assessment

3.10.5.1 Phase 1 habitat surveys have been completed for 91.5% of the area covered by the Onshore Order Limits and 81.4% of the survey area (i.e. the Onshore Order Limits and 150 m buffer). The remaining 8.5% of the Onshore Order Limits and 19.6% of the survey area were assessed from surveys undertaken in adjacent parcels, through the use of aerial photography and desk-based analysis.

3.10.5.2 As it is only a small proportion of the Onshore Order Limits for which phase 1 habitat surveys have not been completed, the use of aerial photography to fill in these gaps does not affect the validity of the baseline assessment. This is especially true considering that much of the unvisited habitats are either built-up areas (e.g., residential development, garden or hardstanding) or comprises agricultural land and associated habitats. Overall, the coverage and approach is considered appropriate and robust for the purposes of informing the baseline conditions and subsequent assessment.

3.10.5.3 Species surveys undertaken to date have included: badger, bat, GCN, otter, water vole, bat roost, bat activity, fish and eel, terrestrial invertebrates, aquatic invertebrates and INNS.

3.10.5.4 Other limitations include weather and health and safety concerns (e.g., survey access granted but livestock present and/or invasive species present). This has resulted in some survey visits being undertaken during less optimal periods, or assessments being undertaken from adjacent accessible land parcels. However, this accounts for a small proportion of the total data collected. As such, the coverage and approach is considered appropriate and robust for the purposes of informing the baseline conditions and subsequent assessment.

3.10.5.5 Access to land has therefore been the main limitation for species surveys but overall a sufficient level of survey coverage has been achieved to inform the assessment set out in this ES.

3.10.5.6 A reasonable worst case scenario has been assessed, such that where the presence, distribution, composition and importance an IEF cannot be fully confirmed on the basis of all available information then a precautionary approach to the assessment has been taken.

3.10.5.7 The geometry of some spatial datasets, notably BHS, means that they are not accurately positioned in relation to the design or some basemaps, leading to the appearance of overlaps and losses from some of these sites which are erroneous. A precautionary approach has been taken in cases where true extent of losses is unclear, and they have been discounted in cases where it is.

3.10.5.8 The Phase 1 habitat data and species surveys undertaken to date over an extensive area have helped to inform the ES and identify areas important for habitats, species and ecological networks. The data, consultation and site knowledge has enabled the ecologists to provide advice on important habitats and species to support the design team. This is sufficient to ensure that the most sensitive habitats were identified early and to allow identification of significant effects and development of appropriate mitigation.

3.11 Assessment of effects

3.11.1 Introduction

3.11.1.1 The impacts of the construction, operation and decommissioning phases of the Transmission Assets on onshore ecology and nature conservation for each of the IEFs identified in **section 3.6.4** are assessed below. This is based on the impacts that have been scoped in for assessment, which are defined in **section 3.7** and described in **section 3.11.2** with reference to the MDS set out in **section 3.9.1**.

3.11.2 Characterisation of impacts and identification of the MDS

3.11.2.1 The section describes the causes and characteristics of the impacts of construction, operation and maintenance and decommissioning phases of the Transmission Assets on onshore ecology and nature conservation. This is based on the impacts that have been scoped-in for assessment, which are defined in **section 3.7** and the information on construction provided the MDS in **section 3.9.1.** The following impacts are considered:

- temporary and permanent habitat loss;
- fragmentation, isolation and disturbance;
- pollution caused by accidental spills/contaminant release, and spread of INNS; and
- changes in air quality from emissions and deposition.

The impact of temporary and permanent habitat loss

3.11.2.2 Construction of the Transmission Assets would result in the temporary (e.g., installation of onshore export cables) or permanent (e.g., construction/ installation of permanent above ground structures, such as onshore

substations and link boxes) loss of habitat, which may support species identified as IEFs in **Table 3.17**.

3.11.2.3 Although it is anticipated that the impacts of temporary habitat loss will be reversible, work could take up to take up to 66 months in a worst case sequential installation scenario. Although the total construction period for sequential construction represents the MDS, most habitat loss would occur over a shorter term period and would be transient in any one location as construction progresses. Habitats will be restored and the impact is therefore temporary. Therefore, on the basis of the MDS, temporary habitat loss will be long term (more than three years), as defined in **section 3.10.3.** In cases where the duration of temporary construction-related habitat loss or disturbance is not considered reversible, such as in the case of irreplaceable habitats, then permanent effects are reported.

3.11.2.4 The MDS is represented by the activities that result in the maximum area of habitat loss and is summarised in **Table 3.21**.

3.11.2.5 During decommissioning, it is expected that the onshore export cables and 400 kV grid connection cables would be left *in-situ* or removed via link boxes to minimise the environmental disturbance during decommissioning. Joint bays and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current use.

3.11.2.6 Decommissioning of the onshore substations will be reviewed in discussion with the offshore transmission owner and appropriate regulators in the light of any other existing or proposed future use of the onshore substations. If complete decommissioning is required, then all of the electrical infrastructure will be removed, and any waste arising disposed of in accordance with relevant regulations. Therefore, any impacts arising from decommissioning are likely to be lower than those during construction.

The impact of fragmentation, isolation and disturbance

3.11.2.1 Removal of habitat will fragment habitats that are themselves IEFs and may result in impacts on species that are supported by that habitat (on which an IEF depends). Habitat fragmentation has been minimised through route selection and the use of trenchless techniques (CoT03). Habitats will be restored as trenches are complete and the impact is therefore temporary and reversible. However, as stated in the MDS construction will take up to 66 months and the impact is therefore long term.

3.11.2.2 Construction, operation and maintenance and decommissioning of the Transmission Assets will result in disturbance (e.g., movement, noise, light spill, vibration), which may result in disturbance of protected or notable species. This disturbance impact may disrupt normal foraging and breeding behaviour and create barriers to resources on which a species depends, with adverse effects on conservation status. The total construction period for sequential construction represents the MDS, meaning disturbance would be long term, but for most of the construction corridor, disturbance would be transient and occur over a short term period in any one location as construction progresses.

3.11.2.3 Construction and decommissioning of the Transmission Assets could result in physical disturbance from changes in ground conditions and hydrology.

3.11.2.4 Activity at the landfall, along the onshore export cable corridor and 400 kV grid connection corridor during the operation and maintenance phase will be limited (with the exception of cable reburial in the intertidal zone). This will involve infrequent on-site inspections of the cables and corrective maintenance activities. The onshore substations will be unmanned, but will be continuously monitored remotely, and there will be operation and maintenance staff visiting the onshore substations to undertake preventative and corrective works on a regular basis (no less than every six months).

3.11.2.5 During decommissioning, it is expected that the onshore export cables will be left *in-situ* or removed from link boxes to minimise the environmental disturbance during decommissioning. Joint bays and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use.

3.11.2.6 The potential impact on IEFs is predicted to vary both spatially and temporally across habitats and seasons in which the IEFs are present. The MDS is represented by the maximum area of disturbance at landfall, the maximum area of disturbance at the substation sites, the maximum duration of disturbance and the maximum width of the corridor in which construction activities relating to the landfall, onshore export cable and the 400 kV grid connection cables are proposed.

The impacts of pollution and the release and spread of INNS

3.11.2.7 The construction and decommissioning of the Transmission Assets has the potential to result in accidental spills/contaminant release, for example from the storage of fuels and chemicals in the temporary construction compounds, bentonite breakouts from trenchless crossings and surface water runoff. Spills and contamination could affect habitats and species directly at the source of the event or indirectly if the contaminants are transferred elsewhere, e.g., via flowing water or by entering the groundwater.

3.11.2.8 Construction and decommissioning could involve the introduction and/or the spread of INNS through the movement of earth, e.g., the import of spoil or the digging of trenches, from the movement of machinery and personnel between locations, and dispersal in watercourses. The unintentional spread of seeds, roots or other material may result in the spread of plant species such as Himalayan balsam *Impatiens glandulifera*, giant hogweed *Heracleum mantegazzianum* and Japanese knotweed *Fallopia japonica*. These species have the potential to displace native species and to potentially become dominant leading to changes in habitat composition and structure, reducing suitability for associated protected or notable species.

3.11.2.9 The MDS is represented by the maximum number of temporary construction compounds and trenchless crossing locations that would cause the greatest risk of a pollution incident. It also represents the maximum duration of construction at landfall, along the onshore export cable corridor and the 400 kV grid connection cable corridor, and for the associated risks of contamination and pollution. Information on the location and timing of

construction is summarised in **Table 3.21**. The majority of the work is temporary with the risk of pollution or the introduction of INNS being present for up to 66 months along the onshore export cable corridor and the 400 kV grid connection cable corridor.

3.11.2.10 Activity at the landfall and along the onshore export cable corridor and 400 kV grid connection corridor during the operation and maintenance phase will be more limited than at construction (with the exception of cable reburial in the intertidal zone). The cables will be continuously monitored remotely with infrequent on-site inspections of the cables and corrective maintenance activities. The onshore substations will be unmanned; the onshore infrastructure will be continuously monitored remotely, and there will be operation and maintenance staff visiting the onshore substations to undertake preventative and corrective works on a regular basis (no less than every six months).

3.11.2.11 During decommissioning, it is expected that the onshore export cables will be left *in-situ* or removed from link boxes to minimise the environmental disturbance. Joint bays and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use. If complete decommissioning is required, then all of the electrical infrastructure will be removed, and any waste arising disposed of in accordance with relevant regulations.

Changes in air quality from emissions and deposition

3.11.2.12 Changes in vehicle movements caused by construction traffic movements will result in increased emissions of airborne pollution. Increases in emissions in close proximity (typically not exceeding 200 m) to sensitive IEFs can result in adverse impacts to their integrity and conservation status.

3.11.2.13 The scope of the assessment is statutorily and non-statutory sites of nature importance, taking account of the reasons for designation and any additional information on the presence of sensitive habitats that may be present. The relevant sites will be identified following confirmation of the affected road network - on which the change in traffic flows as a result of the Transmission Assets can be established.

3.11.2.14 Based on information provided on construction traffic flows, air quality and ecology specialists will establish:

- appropriate critical loads for the relevant sites and habitats;
- the locations where estimates of pollutant concentrations and deposition rates are required;
- estimated impacts sufficiently small that their effects could be described as insignificant;
- the sites and/or pollutants that require further assessment to determine whether, or not, there may be a likely significant effect at the relevant site(s); and
- the assumptions used in the assessment e.g. assessment year, duration of construction traffic and location of ecological habitats of concern.

3.11.2.15 Data from Air Pollution Information System (APIS) will be used obtain site specific critical loads for relevant pollutants, where this is available. Elsewhere pollutant concentration and deposition rates at a particular location will be applied to the habitats within designated sites to match, as far as possible, designated features and site characteristics. This will form the basis for considering the magnitude of any exceedances and significance of effects.

3.11.2.16 The scope of assessment of impacts from changes in air quality includes non-statutory sites (BHS) and ancient woodland as well as statutory sites, of which three LNR and one SSSI are relevant to the assessment, given the extent and location of the affected road network. The selection of critical loads for nitrogen has been made with consideration of the reasons for designation and habitats likely to be present in the vicinity of the road network.

3.11.2.17 As per the MDS, the duration of construction traffic movements and associated emissions is up to 66 months (sequential construction).

3.11.2.18 The method for carrying out the air quality assessment is provided in Annex 9.1: Air quality impacts on ecologically designated sites of Volume 3, Chapter 9: Air quality of the ES.

3.11.3 Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR

Sensitivity of the receptor

3.11.3.1 The Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI/NNR are respectively of international and national importance. In accordance with criteria provided in **Table 3.22**, they are respectively of **very high** and **high sensitivity**.

The impact of temporary and permanent habitat loss

Construction phase: **Magnitude of impact**

3.11.3.2 The Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI are respectively designated for breeding, passage and wintering birds, and for aggregations of non-breeding birds and assemblages of breeding birds, for which an assessment is provided in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES. Further features forming reasons for designation of these sites that are relevant to onshore ecology and nature conservation are a nationally significant population of natterjack toad for the Ramsar site and saltmarsh and neutral grassland habitats for the SSSI. Both of these do not have relevance for areas within the Onshore Order Limits seaward of the dunes.

3.11.3.3 Based on the information presented in Volume 3, Annex 3.1: Onshore ecology desk study and Volume 3, Annex 3.8: Great crested newt and reptile survey technical report of the ES, it is not considered that natterjack toad is present in the Fylde dunes system. An area of saltmarsh is present and has been included within the Onshore Order Limits for the purpose of ecological

mitigation (i.e., within the mitigation areas). The habitat is located outside of the Onshore Infrastructure Area and there will be no construction activities related to the Onshore Infrastructure Area. Areas of neutral grassland habitat that are a feature of the SSSI are not present within the Onshore Order Limits. The habitats present in the Ramsar site and SSSI within the Onshore Order Limits are contained within unit 10 of the SSSI (Salters Bank) and are categorised as littoral sediments. Unit 10 also includes an area of bare and sparsely vegetated sand and a range of pioneer, foredune, mobile and semi-fixed sand dune communities. Impacts on sand dune sites and habitats are discussed in **sections 3.11.4, 3.11.5** and **3.11.10.**

3.11.3.4 The use of the direct pipe methodology to install the cables between the transition joint bays and the direct pipe exit pit on North Beach, with a minimum distance of 100 m from the edge of Lytham St Annes Dunes SSSI (CoT44). This means that the cables will pass beneath these habitats. Construction work at surface level will be at the direct pipe exit pits. Any open trenching will take place at least 100 m seaward of the boundary of Lytham St Annes Dunes SSSI, and as such will not impact any features relevant to onshore ecology that are the reason for the designation of the statutory sites. Impacts of open trenching within the Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI/NNR are considered within Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES for ornithological features.

3.11.3.5 The magnitude of impact on features of the designated sites is considered to be **no change** as the natterjack toad and neutral grassland features of the Ramsar site and SSSI relevant to onshore ecology and nature conservation are not present within the Onshore Order Limits. In respect of saltmarsh, there will be no permanent or temporary habitat loss in the areas of the Ramsar site and SSSI where saltmarsh is present, as these areas are located outside the Onshore Infrastructure Area.

3.11.3.6 For the 400 kV grid connection cables, the cables would be installed outside of the Ramsar site and SSSI and as such that there would be no habitat loss arising from these works within the designated sites. The magnitude of impact on the designated sites from the 400 kV grid connection cables is therefore considered to be **no change**.

3.11.3.7 Impacts on the features of these sites relating to the bird species that they support are set out in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

Construction phase: Significance of the effect

3.11.3.8 The sensitivity of the receptors is **very high or high**, according to the applicable designations and the magnitude of the impact would be **no change**. There would therefore be **no effect**, which is not significant.

Decommissioning phase

3.11.3.9 During decommissioning, cables beneath the dunes would either be left *in situ* or removed from the transition joint bays or link boxes. Cables on the beach may be removed using a reversal of the construction process. Works would be undertaken in accordance with the Onshore Decommissioning

Plan. This would not be anticipated to affect the natterjack toad and neutral grassland features of the Ramsar site and SSSI relevant to onshore ecology and nature conservation as these are not present within the Onshore Order Limits. No impacts on the saltmarsh outside of the Onshore Infrastructure Area are anticipated. The magnitude of impact would be **no change**. There would therefore be **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction and decommissioning phases

3.11.3.10 As discussed in relation to temporary and permanent habitat loss above, there are no impacts on the reasons for designation of these sites that are relevant to onshore biodiversity and nature conservation (natterjack toad, saltmarsh and neutral grassland) as they are not present within the Onshore Infrastructure Area.

3.11.3.11 For the 400 kV grid connection cables, the cables would be installed at a location outside of the Ramsar site and SSSI such that there would be no fragmentation, isolation or disturbance impacts to the designated sites arising from these works.

3.11.3.12 The magnitude of impact would be **no change** and there would be **no effect** from fragmentation and disturbance on the Ribble and Alt Estuaries Ramsar site or the Ribble Estuary SSSI during the construction or decommissioning phases.

3.11.3.13 Impacts on the introduced population of sand lizard that is present in foredune habitat present in these sites (and located within the Onshore Order Limits) are discussed separately in **section 3.11.13**.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase: Magnitude of impact

3.11.3.14 The use of direct pipe for installation of cables beneath the dunes may require the use of cofferdams at the exit pits on North Beach. The exit pits would be located on North Beach, within the Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI. Cofferdams may require piling to install them.

3.11.3.15 For the 400 kV grid connection cables, the crossing beneath the River Ribble upstream (and outside) of the Ramsar site and SSSI would be carried out using trenchless technologies (microtunnel or direct pipe). Compounds would be required for cable installation near the banks on both sides of the river for up to 24 months (in the event of sequential construction).

3.11.3.16 There is potential for accidental release of contaminants below ground during drilling and tunnelling, particularly bentonite breakout. Any release of bentonite would be localised and temporary but the contaminants could enter the groundwater and affect habitats and species present in the protected sites. The risk of pollution from bentonite (or other lubricant) will be controlled during cable installation through the use of the Bentonite Breakout Plan. An Outline Bentonite Breakout Plan (document reference J1.13) is provided as

part of the Outline Code of Construction Practice (CoCP) (document reference J1). This will include measures to avoid breakout and to ensure suitable detection and control and/or remediation measures throughout the drilling/tunnelling process. Given these commitments and the commonplace and established nature of these trenchless techniques (which are now frequently, safely and effectively used), impacts are likely to be **negligible.**

3.11.3.17 In terms of surface pollution to the Ribble and Alt Estuaries Ramsar and Ribble Estuary SSSI/NNR, construction works above ground required for the pull-in of the offshore cables, installation of the cables beneath the dunes and installation of the 400 kV grid connection cables also have the potential for accidental release of contaminants, including through the use of compounds. The location of the crossing of the River Ribble for the 400 kV grid connection cables is located outside of the designated site but it is noted that any pollution associated with accidental spillage or runoff from the construction compounds for the trenchless techniques beneath the River Ribble could be transported to the Ramsar site and SSSI by the tidal movement of water in the estuary. Any potential contamination of water and soil, and generation of dust and particulates will be controlled through implementation of the Dust Management Plan and Pollution Prevention Plan. The Dust Management Plan will include measures to control dust emissions through well-established and effective measures in accordance with recommendations from the Institute of Air Quality and Management (IAQM). The Pollution Prevention Plan will include details of measures to avoid and contain any accidental spillage and locate any hazardous materials away from ecological receptors, as well as emergency spill procedures. Good practice guidance detailed in the Environment Agency's Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance (CoT04 and CoT33). An Outline Dust Management Plan (document reference J1.2) and an Outline Pollution Prevention Plan (document reference J1.4) are provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With effective measures in place, the magnitude of impacts from dust and contaminants from construction activity from surface works would be **negligible**.

3.11.3.18 The risk of introducing or spreading INNS beyond the Onshore Order Limits to areas of the Ramsar site and SSSI that contain potentially vulnerable interest features is unlikely but could occur as a result of construction work for the crossing beneath the River Ribble. It will be avoided and minimised through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). Given these measures, the magnitude of any impacts associated with the release or spread of INNS on the Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI would be **no change.**

Construction phase: Significance of the effect

3.11.3.19 Overall, the sensitivity of the receptor is **very high** and **high** and the magnitude of the impact associated with spread of INNS is deemed to be **no**

change, and that with potential bentonite breakout and pollution at surface would be **negligible**. Overall, the effect would be **no effect** (INNS) and **minor adverse** (risk of bentonite breakout and surface pollution), which is not significant.

Decommissioning phase

3.11.3.20 During decommissioning, cables beneath the dunes and under the River Ribble would either be left *in situ* or removed from the transition joint bays or link boxes. Cables on the beach may be removed using a reversal of the construction process. Works would be undertaken in accordance with the Onshore Decommissioning Plan. With effective measures in place, the magnitude of impact would be **negligible** and the significance of effect would be no greater than **minor adverse**, which is not significant.

Summary of impacts on Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR

Table 3.25: Summary of impacts on Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Very high/high	No effect
Fragmentation, isolation and disturbance: construction and decommissioning	No change	Very high/high	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Very high/high	Minor adverse (bentonite and surface pollution) No effect (INNS)

Further mitigation and residual effect

3.11.3.21 Further to the embedded mitigation measures proposed in **Table 3.20**, additional measures are proposed to reduce the impacts on the Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR where required. Such measures include but are not limited to the following.

- The Ecological Management Plan (CoT76) will include details of any long term mitigation and management measures relevant to onshore ecology and nature conservation and will be developed in consultation with the relevant responsible authorities. An Outline Ecological Management Plan is provided as part of the application for development consent (document reference J6).

3.11.3.22 **Table 3.26** below summarises the impacts and effects on the Ribble and Alt Estuaries Ramsar site, and Ribble Estuary SSSI and NNR with further mitigation in place.

Table 3.26: Impacts and effects on Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI, NNR with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Very high/high	No effect
Fragmentation, isolation and disturbance: construction and decommissioning	No change	Very high/high	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Very high/high	Minor adverse bentonite and surface pollution) No effect (INNS)

3.11.4 Lytham St Annes Dunes SSSI and Lytham St Annes LNR

Sensitivity of the receptor

3.11.4.1 The Lytham St Annes Dunes SSSI and LNR are respectively of national and county importance. The latter designation is contained within the former and both are designated for the presence of sand dunes and associated species. In accordance with criteria provided in **Table 3.22**, they are respectively of **high** and **medium sensitivity**.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.4.2 The Lytham St Annes Dunes SSSI and LNR are both designated for the presence of sand dunes and associated species. Sand dunes are identified as irreplaceable habitat under the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. Therefore, on a precautionary basis, any temporary loss of dune habitats that are features of the SSSI would result in permanent and irreversible changes to the features that form the reasons for designation and could cause an adverse effect on site integrity.

3.11.4.3 As described in CoT44 and described in the MDS, the Applicants have committed to avoiding habitat loss at the Lytham St Annes Dunes SSSI and LNR, as the cables would be installed beneath these sites using a trenchless technique (direct pipe), with no open trenching techniques used in this location and a minimum offset distance of 100 m. Consequently, there would be no temporary or permanent loss of habitat in these designated sites. The magnitude of impact is therefore considered to be **no change**.

Significance of the effect

3.11.4.4 The sensitivity of the receptors is **high or medium**, according to the applicable designations and the magnitude of the impact would be **no change**. There would be **no effect**, which is not significant.

Decommissioning phase

3.11.4.5 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required and no works within the SSSI and LNR are proposed. All decommissioning works would be undertaken in accordance with the Onshore Decommissioning Plan. Therefore, no temporary or permanent habitat loss is predicted. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.4.6 The reasons for designation of Lytham St. Annes Dunes SSSI include the presence of humid dune slacks, and the presence of a diverse plant assemblage that includes species that are additional reasons for designation. A large proportion of the species listed in the citation are associated with dune slacks. The LNR is also designated for sand dune habitats. The SSSI citation refers to a series of exceptionally large and extensive dune slacks on either side of Clifton Drive North that support a wide range of species with varying distribution according to the depth of water and degree of moisture retention in relation to the water table. Further damp habitat is present as a result of previous sand extraction and from current management that, according to information on the condition of the SSSI units, includes the creation of new dune slacks.

3.11.4.7 Humid dune slacks are an Annex I habitat listed under the Habitats Regulations, which defines them as low-lying areas within dune systems that are seasonally flooded and where nutrient levels are low and with a high degree of variability according to climate, substrate and succession. The description also states that true dune slacks are fed mainly by rainwater and are characterised by a pattern of pronounced annual fluctuation of the water table, related to the landform of the dune system as well as climate and the nature of the underlying sediment.

3.11.4.8 Information on the condition of the SSSI features states that the dune slacks and associated plants are in an unfavourable recovering condition. This mirrors the information on the SSSI units, which notes (in relation to the invertebrate assemblages which are a further interest feature of the SSSI) that matters such as erosion of the dunes and the presence of rank and competitive grassland and invasive species are being managed and controlled. The condition assessment does not refer to any matters relating to the hydrological status of the SSSI. Nor does the ecological evaluation of the work carried out by the Fylde Sand Dunes Project (Graeme Skelcher Ecological Consultant, 2024), which instead refers to a wide range of

management matters originally identified in a site management plan produced in 2008. NVC and scarce plant surveys carried out in 2016 demonstrate that the various dune slack and other wetland NVC communities present at the SSSI are in some cases, small, scattered and atypical. Several of the scarce plant species previously recorded in the dune slack vegetation were not found or had declined at the time of the 2016 surveys. The 2024 ecological evaluation notes (Graeme Skelcher Ecological Consultant, 2024) that management carried out since 2016 has dramatically improved habitat for dune slack and dune grassland species, meaning that the populations and assemblages of species may have recovered. Surveys carried out by the Applicants in August 2024 confirmed that the wetland NVC communities present in the dunes have not materiality changed from those reported in the 2016 surveys, and as such the 2016 surveys comprise an adequate baseline for assessment.

3.11.4.9 Based on the information provided above, the SSSI and dune slacks in particular are considered to be vulnerable to hydrological change and support the range of dune slack communities and populations and assemblages of scarce wetland plants that have historically been present.

3.11.4.10 The installation of cables beneath Lytham St Annes Dunes SSSI would be undertaken by direct pipe. This will avoid any habitat loss, damage or disturbance at surface. However, this could result in hydrogeological changes that may affect the dune slack habitat. These changes are considered in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Lytham St Annes Dunes SSSI is identified as a sensitive groundwater-dependent feature. This assessment identifies that shallow groundwater is expected within the near surface sand and gravel deposits and that it is likely to have been artificially drawn down by current abstraction from the aquifer and improved land drainage in the adjoining St Annes Old Links golf course.

3.11.4.11 There are two potential causes of hydrogeological change in the SSSI, one is associated with dewatering during construction (temporary impacts), and the other with the presence of export cables below the surface that could disrupt the aquifer that sustains the dune slacks, for which any impacts during construction would continue after construction (and would be long term/permanent impacts). Both are discussed below.

3.11.4.12 The construction of the transition joint bays and installation of export cables beneath Lytham St. Annes Dunes SSSI will require excavation of entry pits at Blackpool Airport. This will require dry excavations which is likely to involve groundwater dewatering through pumping. Dewatering of the entry pits in the vicinity of unconfined aquifer units could result in:

- groundwater levels being locally reduced by up to 3 m in depth within the excavations on a temporary basis; and
- change in local groundwater flow directions, which will become temporarily oriented towards the dewatered excavations.

3.11.4.13 The recovering condition and positive management of the SSSI indicate that the dune slack vegetation would be resilient to a temporary change in water availability. Additionally, plant communities within the dune slacks may have the capacity to adapt to temporary variation in water availability as noted in

2016 NVC survey, undertaken on behalf of the Fylde Sand Dunes Project that notes an observed increase in the extent of dune slacks within the LNR possibly as *'a reaction to higher or lower periods of rainfall where transitional vegetation fluctuates between dune-slack or drier dune-grassland/mesotrophic-grassland accordingly, whilst retaining significant elements of both vegetation types either way*'.

3.11.4.14 Therefore, in summary, it is considered highly unlikely that temporary changes in water availability from dewatering have adverse impacts to dune slack vegetation communities or the notable species they contain.

3.11.4.15 Groundwater levels would recover after construction assuming that the excavated materials are used as backfill and are not subject to artificial compaction. Excavated materials allow groundwater levels to recover primarily due to their improved drainage properties and permeability. This would be controlled through the CoCP. An Outline Code of Construction Practice provided as part of the application (document reference J1).

3.11.4.16 A preliminary assessment of the impact of dewatering has been carried out using available borehole data. A value of 3 m has been used given the relatively shallow excavations for the launch pits. Based on this, a radius of influence within which the extent of dewatering would occur has been identified as 120 m. Using a 'factor of safety' of double, this results in a 240 m zone of influence. This is less than the distance between the launch pits and the SSSI (which is measured at approximately 600 m). It is worth noting that the benefit of the sheet piling construction of the launch pits in reducing the zone of influence has not been considered, which offers an additional level of conservatism. With regards to dewatering at pipe exit, no sensitive receptors have been identified. Saline water is expected in the saturated coastal sand and gravel deposits where the direct pipe will exit at or around MHWS. Freshwater may be encountered if a lens forms above the saline water where the dunes extend above MHWS.

3.11.4.17 Therefore, no changes in groundwater as a result of dewatering during construction are anticipated within the designated sites. The magnitude of impact associated with dewatering would be **no change**.

3.11.4.18 The second potential impact from changes in groundwater availability on the dune slacks is associated with the presence of the export cables below the surface. The maximum depth of direct pipe for the installation of the cables is expected to be 30 m, which is likely to coincide with the underlying clay or underlying mudstones of the Mercia Mudstone Group. Where this depth can be maintained such that the cables are installed below the water table within the lower, less permeable horizons as much as possible, the magnitude of impact on the hydrogeological regime is considered likely to be short term and low. The depth of installation will vary at different locations in the vicinity of the SSSI and the proportion of the cable within the less permeable horizons is not currently known. Consequently, on a precautionary basis, it is considered that installation of the cable ducts could cause changes in the composition and distribution of vegetation communities in the SSSI due to changes in the hydrogeological regime. On the basis of the assessment provided above, changes in hydrogeology from the installation of the cable duct could permanently reduce groundwater on which plant species

composition and vegetation zonation depends. The magnitude of the impact on the SSSI could be up to **high** and adverse.

Construction phase: Significance of the effect

3.11.4.19 Overall, the sensitivity of the receptor is **high** and **medium** and the magnitude of the impact associated with dewatering during construction would be **no change**, given the distance from the entry pits. There would therefore be **no effect**.

3.11.4.20 The impact associated with the presence of the cables could be up to **high**. The significance of the effect would therefore be up to **major adverse**, which is significant. This would be a long term/permanent effect. See **paragraph 3.11.4.34** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Operation and maintenance phase

3.11.4.21 As set out above, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue in the long term. This is assessed as a long term effect in the construction section above.

3.11.4.22 No new effects would arise during the operation and maintenance phase. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

Decommissioning phase

3.11.4.23 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required and no works within the SSSI and LNR are proposed.

3.11.4.24 In the event of continued presence of the cables, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue. This is assessed as a long term effect in the construction section above.

3.11.4.25 In the event that cables are removed, all decommissioning works would be undertaken in accordance with the Onshore Decommissioning Plan. Therefore, no new impacts relating to fragmentation, isolation and disturbance are predicted. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase: Magnitude of impact

3.11.4.26 As stated in CoT44 and described in the MDS, the Applicants have committed to avoiding habitat loss at Lytham St Annes Dunes SSSI and LNR. The export cables would be installed beneath these sites using a trenchless technique (direct pipe) and open trenching techniques would not be used.

3.11.4.27 There is a risk, however, of a bentonite breakout during the direct pipe works. This would be localised but could enter ground water or affect species and habitats present in the designated sites. The impacts would be temporary and reversible but challenging to remediate given the sensitivity of the habitats above ground and the depth of the egress underground. The risk of pollution from bentonite (or other lubricant) will be controlled during cable installation through the use of the Bentonite Breakout Plan. This will include measures to avoid breakout and to ensure suitable detection and control and/or remediation measures throughout the drilling/tunnelling process. An Outline Bentonite Breakout Plan is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). It should also be noted that such risk is reduced when using direct pipe compared to other trenchless techniques, as set out in the Outline Bentonite Breakout Plan (document reference J1.13). Given these commitments and the commonplace and established nature of these trenchless techniques (which are now frequently, safely and effectively used), impacts are likely to be **negligible.**

3.11.4.28 Above ground activities associated with the installation of the offshore export cables in the intertidal area and at the transition joint bays and direct pipe exit pits also have the potential for accidental release of contaminants. This could include pollution associated with accidental spillage or runoff from the compounds within and outside of designated sites. This could occur at the construction compound for the offshore cable beneath the dunes which is adjacent to Lytham St Annes Dunes SSSI and the compounds for the exit pits on North Beach, which are within the Ribble Estuary SSSI and approximately 50 m from Lytham St Annes Dunes SSSI.

3.11.4.29 ~~A~~ny potential contamination of water and soil, and generation of dust and particulates will be controlled through implementation of the Dust Management Plan and Pollution Prevention Plan. The Dust Management Plan will include measures to control dust emissions through well-established and effective measures in accordance with recommendations from the IAQM (CoT33). The Pollution Prevention Plan will include details of measures to avoid and contain any accidental spillage and locate any hazardous materials away from ecological receptors, as well as emergency spill procedures. Good practice guidance detailed in the Environment Agency's Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance (CoT04). An Outline Dust Management Plan (document reference J1.2) and an Outline Pollution Prevention Plan (document reference J1.4) are provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With effective measures in place, the magnitude of impacts from dust and contaminants from construction activity from surface works would be **negligible**.

3.11.4.30 Coastal plant communities and the notable plant and invertebrate species they contain are a reason for the designation of the SSSI and LNR and are vulnerable to impacts from INNS. INNS such as Japanese rose *Rosa rugosa* and non-native populations of sea buckthorn *Hippophae rhamnoides* can out compete important coastal plant communities and change the conditions that they require to exist. Any impacts from INNS on notable terrestrial

invertebrates would be largely associated with the changes in vegetation communities they cause, that would alter the conditions such as light, heat and the presence of key forage species that the notable invertebrate communities require. The introduction of INNS to coastal plant communities at these sites is unlikely as no construction work will be carried out in them. Any risk, for example transportation of INNS via traffic movements on nearby roads, would be controlled through implementation of the Biosecurity Protocol. INNS identified to date during surveys are set out in Volume 3, Annex 3.14: Invasive non native species technical report of the ES, and are summarised in **Table 3.15**.

3.11.4.31 An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). Consequently, given these commitments the magnitude of any impacts associated with the release or spread of INNS will be **no change**.

Construction phase: Significance of the effect

3.11.4.32 The sensitivity of the receptors is **high** and **medium** according to the applicable designations and the magnitude of the impact associated with spread of INNS is deemed to be **no change,** and that with potential bentonite breakout and pollution at surface would be **negligible**. Overall, the effect would be **no effect** (INNS) and **minor adverse** (bentonite breakout and surface pollution), which is not significant.

Decommissioning phase

3.11.4.33 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required. All cable removal would be in accordance with the Onshore Decommissioning Plan and no works within the SSSI and LNR are likely. With effective measures in place, the magnitude of impact would be **negligible** and the significance of effect would be no greater than **minor adverse**, which is not significant.

Summary of impacts on Lytham St. Annes Sand Dunes SSSI and LNR

Table 3.27: Summary of impacts on Lytham St. Annes Sand Dunes SSSI and LNR

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and decommissioning	No change	High/medium	No effect
Fragmentation, isolation and disturbance: Construction.	No change (dewatering during construction) Up to high (presence of cables)	High/medium	No effect (dewatering during construction) Up to major adverse (presence of cables)
Fragmentation, isolation and disturbance: operation and decommissioning	No change	High/medium	No effect

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Pollution caused by contaminant release, and spread of INN: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	High/medium	Minor adverse (bentonite and surface pollution) No effect (INNS)

Further (secondary) mitigation and residual effect

3.11.4.34 Further to the embedded mitigation measures proposed in **Table 3.20**, additional measures are proposed to reduce the impacts on Lytham St. Annes Sand Dunes SSSI and LNR where required.

The impact of fragmentation, isolation and disturbance

3.11.4.35 **Table 3.20** provides information on measures (commitments) adopted as part of the Transmission Assets. CoT41 and CoT128 confirm that ground investigation and hydrogeological risk assessment will be undertaken for the Lytham St Annes sand dunes post consent as part of detailed design for the project. The assessment will confirm detailed design parameters, including cable burial depth beneath the dunes, to avoid any adverse effects on hydrologically dependent surface water features of the sand dune system. This would reduce the magnitude of the impact to **low**. The effect of changes in hydrogeology on the SSSI and LNR would, therefore, be **minor adverse** which is not significant.

3.11.4.36 The Ecological Management Plan (CoT76) will include detail of any long term mitigation and management measures relevant to onshore ecology and nature conservation and will be developed in consultation with the relevant responsible authorities.

3.11.4.37 The Outline Biosecurity Protocol (document reference J1.12) will be developed further and the final Biosecurity Protocol will be agreed with relevant authorities prior to construction.

3.11.4.38 **Table 3.28** below summarises the impacts and effects on Lytham St. Annes Sand Dunes SSSI and LNR with secondary mitigation in place.

Table 3.28: Impacts and effects on Lytham St. Annes Sand Dunes SSSI and LNR with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction and decommissioning	No change	High/medium	No effect
Fragmentation, isolation and disturbance: construction	No change (dewatering during construction) Low (presence of cables)	High/medium	No effect (dewatering during construction) Minor adverse (presence of cables)

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Fragmentation, isolation and disturbance: operation and decommissioning	No change	High/medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	High/medium	Minor adverse bentonite and surface pollution) No effect (INNS)

3.11.5 Red Scar and Tun Brook Woods SSSI

Sensitivity of the receptor

3.11.5.1 Red Scar and Tun Brook Woods SSSI is of national importance. In accordance with criteria provided in **Table 3.22**, it is of **high** sensitivity.

3.11.5.2 The features of the SSSI are lowland mixed deciduous woodland, wet woodland and a population of the nationally scarce white-letter hairstreak butterfly, which is at the northern limit of its range. All are in favourable condition.

3.11.5.3 The SSSI consists of four units, which are all lowland broadleaved, mixed and yew woodland and in favourable condition. The closest unit to the M6 is unit 1 Boilton Wood which extends from approximately 10 m to 720 m from the road edge. It now meets targets set in favourable condition but ongoing control of invasive Himalayan balsam is required and ash dieback is a potential threat.

3.11.5.4 APIS identifies three woodland vegetation communities of which two are ash woodland and likely to reflect the characteristics of unit 1. It confirms that lichens and bryophytes are integral to this habitat which has been taken into account in determining sensitivity for air quality assessment.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase

3.4.1.1 Risks of pollution from dust and runoff from construction vehicles will be controlled by measures in the Outline Code of Construction Practice (CoCP) (document reference J1), which includes an Outline Dust Management Plan and (document reference J.12) an Outline Pollution Prevention Plan (document reference J1.4) that set out measures to control dust and any spillages. Given these embedded commitments, the likelihood of adverse effects on the SSSI is low and the impacts would be temporary, localised and reversible. The magnitude of impact would be **negligible**.

3.4.1.2 The risk of introducing or spreading INNS will be controlled through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies the application for

development consent. The magnitude of impacts associated with spread of INNS at this SSSI would be **no change**.

Significance of the effect

3.11.5.5 Overall, the sensitivity of the receptor is **high,** and the magnitude of the impact associated with the spread of INNS is deemed to be **no change,** and that with dust and pollution is **negligible**. Overall, the effect would be **no effect** (INNS) to **minor adverse** (other pollution), which is not significant.

Decommissioning phase

3.11.5.6 The magnitude of impact on the SSSI during decommissioning would be **negligible** and the significance of effect is **minor adverse**.

The impact of changes in air quality from emissions and deposition

Construction phase

Magnitude of impact

3.11.5.7 The predicted traffic movements caused by the construction of the Transmission Assets on the section of the M6 motorway between junction 31A and 31, to which Red Scar and Tun Brook Woods SSSI is adjacent, are predicted to be circa 800 vehicles as annual average daily traffic (AADT). This comprises circa 326 light duty vehicle (LDV) movements and circa 474 heavy duty vehicle (HDV) movements. The number of HDV vehicles is more than double the screening threshold of 200 (as per LA105, DMRB).

3.11.5.8 Maximum process contribution (PC) and predicted environmental concentration (PEC) of nitrogen oxides (NO_x), ammonia (NH_3) and nitrogen (N)/acid deposition have been compared against the applicable critical levels/loads for the relevant habitat type/interest feature of the SSSI. Using the applicable assessment method, which is described in Annex 9.1 of Volume 3, Chapter 9: Air quality of the ES, a long-term PC of more than 1% of the long-term environmental standard i.e., the relevant critical levels/loads, must be considered for further assessment.

3.11.5.9 The impact of emissions associated with the additional traffic has been modelled in relation to the site-specific data obtained from APIS, for the types of broadleaved woodland that are present. The following results were obtained.

- Annual-mean NO_x: The maximum annual-mean NO_x PC does not exceed 1% of the critical level and the impacts can be screened out as insignificant.
- Daily-mean NO_x: The maximum daily-mean NO_x PC does not exceed 10% of the critical level at the SSSI and the impacts can be screened out as insignificant.
- Annual-mean NH_3: The maximum annual-mean NH_3 PC at the closest point of the SSSI to the M6 is 0.1 $\mu g.m^{-3}$ which is 10% of the critical level and therefore exceeds the 1% threshold. For this site, the critical level

used is 1 µg.m^{-3} on the basis that there are important populations of lower plants within the woodland. When the PC is added to the background concentrations of 2.08 µg.m^{-3}, the resulting predicted environmental contribution (PEC) is 2.2 µg.m^{-3} and the PEC exceeds the critical level for lower plants only (note that the critical level for NH_3 for higher plants, i.e. the trees and other vascular plants (including elm, as the food plant of white-letter hairstreak), is 3 µg.m^{-3} which would not be exceeded).

- Nutrient N Deposition: The maximum PC at the closest point of the SSSI to the M6 is 0.82 kgN.ha^{-1}.yr^{-1} which is 5% of the critical load and therefore exceeds the 1% threshold. When the PC is added to the background deposition rate of 34.87 kgN.ha^{-1}.yr^{-1}, the resulting PEC exceeds the critical load.
- Acid Deposition: The maximum PC at the closest point of the SSSI to the M6 is 0.06 keq.ha^{-1}.yr^{-1} or 3% of the critical load function and therefore exceeds 1% threshold. When the PC is added to the background deposition rate of 2.54 keq.ha^{-1}.yr^{-1} the resulting PEC exceeds the critical load function.

3.11.5.10 On this basis, further analysis has been undertaken with respect to changes in NH_3, nitrogen deposition and acid deposition to determine the magnitude of impact.

3.11.5.11 In respect of NH_3, the contour for which the concentrations are 0.015 or higher i.e. 1.5% of the critical level of 1 µg.m^{-3}, which when rounded to a whole integer is 2%, extends to 200m from the road edge. This extent covers approximately 1.69 ha or 22% of Unit 1 of the SSSI (7.84ha) or approximately 2.7% of the entire SSSI (63.62ha), the majority of which is, broadly, ash woodland. This critical level only relates to the lower plant population of this area of woodland; the PEC is below the critical level set for all other plant species (3 µg.m^{-3}). As such, no impacts to the higher plants in the SSSI are predicted from changes in NH_3 concentrations.

3.11.5.12 The distribution of lower plant species within the area covered by the exceedance of the 1% threshold is not known. However, it is considered unlikely they would be fully represented in the part of the SSSI where impacts from Transmission Assets would occur. This is because it is probable that decades of emission form motorway traffic means that sensitive species would already be absent in the areas where impacts are predicted. On this basis, a change in the NH_3 concentration would be unlikely to affect the distribution of the lower plant population of the SSSI in the location where the exceedance of the 1% threshold occurs.

3.11.5.13 The area of the SSSI that is covered by the exceedance of the 1% of the critical load with respect to nitrogen deposition extends to circa 85 m from the edge of the SSSI closest to the M6. This equates to circa 0.71 ha or 1.1% of the total area of the SSSI. Further, the SSSI is already subject to significant nitrogen loading (circa 35 kgN.ha^{-1}.yr^{-1} at the closest point of the SSSI to the M6), reflecting the very high traffic flows along a busy motorway.

3.11.5.14 The additional nitrogen that the exceedance of 1% of the critical load represents might result in a very small increase in the abundance of

nitrophilous species within the woodland potentially impacted. However, in the context of a site already subject to significant loadings, the additional loading from the traffic associated with the construction of the Transmission Assets is highly unlikely to give rise to ecological-meaningful change (see Capon *et al*. 2016 for information regarding dose-response relationships). Given the exceedance covers such a small area, and in the context of a declining background nitrogen deposition, such an increase is therefore highly unlikely to change the overall habitat condition of the woodland, given it is still in good condition despite high existing background deposition rates.

3.11.5.15 The additional acid deposition associated with the change in traffic flows due to the construction of the Transmission Assets would exceed 1% of the critical load function. This exceedance extends circa 35 m into the SSSI from the closest point of the designated site to the M6, covering an area of circa 0.28 ha or 0.4% of the SSSI. As with nitrogen deposition, this small area may experience some minor decreases in soil pH. However, this is unlikely to be ecologically significant, in the context of a site already subject to significant acid loadings (the existing background is 2.54 keq.ha^{-1}.yr^{-1} of the critical load function).

3.11.5.16 With respect to all pollutants, the potential effect would potentially occur for the duration of the construction period, i.e. a maximum of 66 months. The predicted impacts on the SSSI are therefore temporary (i.e. no more than 66 months), albeit long-term, and potentially reversible but the time required and the extent to which the habitat would return to baseline conditions is not known.

3.11.5.17 The volumes of pollutants described above and the duration for which they would be present at the stated levels are precautionary because of assumptions made regarding constitution and in the traffic model. They include:

- the greatest reasonable estimates of the amount of components and excavations and hence transported materials;
- concurrent construction of the Transmission Assets results in the greatest number of construction vehicle movements;
- that all construction movements take place on the road network and none by rail or shipping; and
- that all materials are procured from outside of the study area so that construction HGVs are assigned onto all relevant highway links within the study area.

3.11.5.18 In summary the assessment is precautionary in three key respects: the duration of construction, which is based on the sequential construction period, the number of traffic movements per year and as AADT which is based on the concurrent construction of the Transmission Assets, and that pollution sensitive species remain close to the motorway in the area of the SSSI that will be affected by emissions during construction of the Transmission Assets. The area covered by any potential effect is small in the context of the SSSI as a whole (1% or less for both nitrogen and acid deposition) and in the context of very high existing background pollutant

levels. On this basis, therefore, the magnitude of impacts is up to **low** and adverse.

Significance of the effect

3.11.5.19 The impact associated with changes in air quality from emissions and deposition could be up to **low**. The significance of the effect would therefore be up to **minor adverse**, which is not significant.

Decommissioning phase

3.11.5.20 During decommissioning, cables would either be left in situ or removed from the transition joint bays. No new trenching would be required. The traffic movements associated with decommissioning are therefore unlikely to produce emissions that would result in impacts on the SSSI. The magnitude of impact would be **negligible**, and the significance of effect would be no greater than **minor adverse**, which is not significant.

Summary of impacts on Red Scar and Tun Brook Woods SSSI

Table 3.29: Summary of impacts on Red Scar and Tun Brook Woods SSSI

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (surface pollution) No change (INNS)	High	Minor adverse (surface pollution) No effect (INNS)
Changes in air quality from emissions and deposition: construction	Low	High	Minor adverse
Changes in air quality from emissions and deposition: construction	Negligible	High	Minor adverse

Further (secondary) mitigation and residual effect

3.11.5.21 Further to the embedded mitigation measures proposed in **Table 3.20**, additional measures are proposed to reduce the impacts on Red Scar and Tun Brook Woods SSSI where required.

The impact of changes in air quality from emissions and deposition

3.11.5.22 The Outline Biosecurity Protocol (document reference J1.12) will be developed further and the final Biosecurity Protocol will be agreed with relevant authorities prior to construction.

3.11.5.23 **Table 3.28** below summarises the impacts and effects on Red Scar and Tun Brook Woods SSSI with secondary mitigation in place.

Table 3.30: Impacts and effects on Red Scar and Tun Brook Woods SSSI with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (surface pollution) No change (INNS)	High	Minor adverse (surface pollution) No effect (INNS)
Changes in air quality from emissions and deposition: construction	Low	High	Minor adverse
Changes in air quality from emissions and deposition: construction	Negligible	High	Minor adverse

3.11.6 Biological Heritage Sites and Local Nature Reserves

Sensitivity of the receptor

3.11.6.1 Each BHS is important at the county level and is therefore of **medium** sensitivity. LNR are also of **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.6.2 The Applicants have sought to avoid BHS designations as part of the site selection process, wherever practicable (CoT03) (see Volume 1, Chapter 4: Site selection and consideration of alternatives). As shown in Volume 3, Figure 3.5, 11 BHSs are located wholly or partially within the Onshore Order Limits. For the sites listed below, adverse impacts associated with temporary trenching works required for installation of the onshore export cables and/or 400 kV grid connection cables would be avoided through the use of HDD or other trenchless techniques. Where applicable, other elements of the design and construction of the Transmission Assets within these sites have been identified below.

- Lea Marsh BHS is located within the Onshore Order Limits. This site has been included within the Onshore Order Limits for the purposes of biodiversity benefit, particularly in order to offset the impacts of potential construction disturbance on the population of otter associated with Savick Brook (otters are considered in **section 3.11.14** below). In addition, temporary access for the 400 kV grid connection cable corridor and an operational access track, together approximately 0.09ha, are proposed along the eastern boundary of this site. However, this access route is an existing track and in an area of species-poor neutral grassland. There will not therefore be any impact on the saltmarsh habitat for which the site is designated.
- Lytham Foreshore Dunes and Saltmarsh BHS, of which part has been included in the Onshore Order Limits for the purposes of ornithological

mitigation, to offset the impacts on waders and other birds forming reasons for designation of Ribble Estuary SSSI and Ribble and Alt Estuary Ramsar site. A proposed new on-foot construction access route would occupy less than 0.13 ha of the site (to allow construction workers access to the direct pipe exit pit and cable pulling works) and using existing areas of bare sand across the dunes and foreshore associated with public access to the beach. This will avoid damage to plants and habitats.

- Mason's Wood BHS, below which the 400 kV grid connection cable corridor would be installed using trenchless techniques, with the area of trenchless technique extending to at least 40 m from the edge of the designation (as identified in Volume 3, Annex 3.2: Crossing schedule of the ES). There would be no additional elements of the Transmission Assets that could affect this site.
- River Ribble, Lower Tidal Section BHS, within which an operational access route occupying less than 0.11 ha, situated on the top of a flood defence is proposed. This will not involve any changes to the existing access provision in this area. An area of 0.17ha is associated with the ecological mitigation at proposed at Lea Marsh BHS.
- Savick Bridge BHS, within which the junction of an operational access track with the A583 Blackpool Road is proposed, in species-poor neutral grassland, which is not a reason for designation, on the western edge of the site and occupying less than 0.01 ha.

3.11.6.3 St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS, within which an pedestrian only construction access route is proposed largely along the eastern boundary and would occupy less than 0.05 ha of the site, and uses an existing access within the golf course, which will avoid damage of plants and habitats. There is also 0.04ha for monitoring access.

3.11.6.4 The location of BHSs in relation to the Onshore Order Limits are presented in Volume 3, Chapter figures, Figure 3.5.

3.11.6.5 The magnitude of impact on seven of the sites listed above would be **negligible** at most and would be **no change** at Mason's Wood BHS.

3.11.6.6 The impact of largely temporary loss of farmland habitat on pink footed goose and whooper swan, which are the reasons for designation of Lytham Moss BHS, is assessed in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

3.11.6.7 There would be unavoidable and permanent loss of BHSs within areas of the Onshore Infrastructure Area where land is permanently required (and therefore habitat permanently lost). Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS are both wholly located within land permanently required for the Morgan onshore substation and would therefore be permanently removed during the construction phase. In both cases the magnitude of impact would be **high**.

3.11.6.8 The Onshore Order Limits include land required for Morgan/Morecambe National Grid connection works and the National Grid connection compound. These areas are partially within the Mill Brook Valley BHS and would

together result in the loss of 2.27 ha of the site including approximately 1.18 ha of grassland habitat that is the reason for designation of the BHS. Habitat would be reinstated but the impact will be long term and there is a risk that habitat of comparable quality cannot be provided or maintained. Therefore, the magnitude of impact would be up to **high**.

3.11.6.9 A single LNR, Lytham St. Annes Dunes, is within the Onshore Order Limits. As discussed in relation to Lytham St. Annes Dunes SSSI in **section 3.11.4**, the LNR is situated within the SSSI, and loss of habitat is avoided through the use of direct-pipe trenchless technology. One LNR is located 0.03 km from the Onshore Order Limits. Three further LNR are situated within 200 m of the road network on which construction traffic movements has been modelled. In all cases there is no loss of habitat and the magnitude of impact is therefore **no change.**

Construction phase: Significance of the effect

3.11.6.10 The magnitude of impact on Freshfield Farm Pond, North BHS, Freshfield Farm Pond, South BHS and Mill Brook Valley BHS, where the designated sites would be wholly or partially removed, would be **high** and therefore the significance of the effect would be **moderate adverse**, which is significant. See **paragraph 3.11.4.34** for further (secondary) mitigation measures proposed to reduce the significance of effect.

3.11.6.11 For the remaining BHSs, with the exception of Lytham Moss, for which assessment is provided in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES, the impact would be **no change** to **negligible**, resulting in **no effect** or a **negligible** effect, which is not significant.

3.11.6.12 The significance of effects on LNR is **no effect**.

Decommissioning phase

3.11.6.13 For Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS, the magnitude of impact would be **no change** and there would be **no effect** at decommissioning as the BHSs would be permanently lost during construction. This would also apply to that part of the Mill Brook Valley BHS removed during construction.

3.11.6.14 With regard to all remaining sites, during decommissioning, cables would either be left *in situ* or removed from link boxes. No new trenching would be required. The magnitude of impact on remaining BHSs and LNR would therefore be **no change**. There would be **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.6.15 There would be no additional fragmentation, isolation and disturbance impacts to the two BHSs lost during the construction phase (the loss has already been assessed above).

3.11.6.16 The St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS is located wholly within the Onshore Infrastructure Area, while the

Lytham Foreshore Dunes and Saltmarsh BHS is located partially within the Onshore Order Limits. Both are designated for the coastal habitats and associated assemblages of plants that they support. The citations refer to the presence of notable wetland plant species, which include species that occur in dune slack vegetation including yellow bartsia, marsh helleborine, chaffweed and grass-of-Parnassus. The direct pipe technique proposed to install the export cables at the landfall would pass beneath these sites, but they are vulnerable to the impacts of changes in groundwater as described for Lytham St. Annes Dunes SSSI and LNR (**section 3.11.4** above). The precautionary 180 m zone of influence that has been used to assess impacts of dewatering on the SSSI extends approximately 40 m into the eastern part of the St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS, so may lead to temporary adverse impacts on this site. It would not affect the Lytham Foreshore Dunes and Saltmarsh BHS. However, both BHSs are vulnerable to changes in hydrogeology associated with installation of the cables below the surface that could cause long term changes in species composition.

3.11.6.17 The potential magnitude of the impact on these BHSs would be up to **high** and adverse.

3.11.6.18 No impacts from changes in hydrogeology on wetland habitats and plant communities are likely at the Howick Hall Ponds, Lea Marsh, Mill Brook Valley, River Ribble, Lower Tidal Section, Mason's Wood BHS, Savick Bridge BHS or Westby Clay Pit BHSs. These sites are in areas described in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES as being underlain by clay rich deposits of glacial till or tidal flat deposits. These geological units do not contain significant groundwater and do not contribute significantly to surface flows. This is supported by the large number of small, isolated ponds across the study area and absence of abstractions, which reflect the low permeability of the underlying geology. Surface water sources would be protected during construction and no impacts would occur. The magnitude of impact for these sites is **no change**.

3.11.6.19 It is unlikely that construction activities (construction of the onshore export cable or construction of the 400 kV grid connection cable) in or near to Howick Hall Ponds, Lea Marsh, Mill Brook Valley, River Ribble, Lower Tidal Section or Savick Bridge BHSs would cause significant disturbance or fragmentation as these sites are designated for primarily plants and invertebrates that are not typically sensitive to noise, light and movement. They are, however, highly sensitive to trampling but this will be minimised or avoided through restriction of movement of personnel and machinery to within the Onshore Order Limits. The magnitude of impact on these sites would be **negligible**. No impacts are expected at Mason's Wood, which would result in a magnitude of impact of **no change**.

3.11.6.20 The reasons for designation of Howick Hall Ponds BHS and Westbury Clay Pits BHS include the presence of populations of GCN. It is possible that construction activities at Howick Hall Ponds BHS associated with the Morgan/Morecambe National Grid connection works and an operational access track could result in disturbance and risk killing and injury. However, as described in the assessment of impacts on GCN, which is provided in

section 3.11.12, this will be avoided through measures contained in the OEMP and any impacts would be negligible.

3.11.6.21 The impact of disturbance and fragmentation on the BHSs within or close to the Onshore Order Limits that are designated for birds, including Lytham Moss, is assessed in Volume 3, Chapter 4: Onshore and intertidal and ornithology of the ES.

3.11.6.22 For LNR, the magnitude of impact of fragmentation, isolation and disturbance is **no change.**

Construction phase: Significance of the effect

3.11.6.23 For the St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS, the magnitude of impact from changes in hydrogeology would be up to **high** and therefore the significance of the effect would be up to **moderate adverse**, which is significant. See **paragraph 3.11.4.34** for further (secondary) mitigation measures proposed to reduce the significance of effect.

3.11.6.24 No impacts are expected at Mason's Wood, which would result in a magnitude of impact of **no change** and a significance of **no effect.**

3.11.6.25 The magnitude of impact from disturbance for the other six BHSs would be up to **negligible** and therefore there would be a **negligible** effect, which is not significant.

3.11.6.26 For LNR, the significance of effect of fragmentation, isolation and disturbance is **no effect.**

Operation and maintenance phase

3.11.6.27 As set out above, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue. This is assessed as a long term effect in the construction section above.

3.11.6.28 No new effects would arise during the operation and maintenance phase. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

Decommissioning phase

3.11.6.29 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required. All cable removal would be in accordance with the Onshore Decommissioning Plan and no works within the BHSs are likely.

3.11.6.30 In the event of continued presence of the cables, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue. This is assessed as a long term effect in the construction section above.

3.11.6.31 In the event that cables are removed, all decommissioning works would be undertaken in accordance with the Onshore Decommissioning Plan. Therefore, no temporary or permanent habitat loss is predicted. The

magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase: Magnitude of impact

3.11.6.32 Eleven BHSs are located wholly or partially within Onshore Order Limits. Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS are both located wholly within land permanently required for the Morgan onshore substation and would be removed prior to construction. They would therefore not be subject to any impacts from pollution or INNS.

3.11.6.33 Temporary works at the nine BHSs that remain during construction would be reduced or avoided because HDD or other trenchless techniques would be used to install cables beneath the sites, avoiding the need for open trenching. An Outline Code of Construction Practice (CoCP) accompanies the application for development consent (document reference J1), which contains an Outline Bentonite Breakout Plan. The plan includes measures to control the risks associated with a bentonite breakout during trenchless cabling. Given these commitments, the magnitude of impact from pollution from the implementation of trenchless techniques is considered to be **negligible**.

3.11.6.34 There are additional risks of pollution, for example from dust and runoff, particularly at BHSs that are close to construction compounds, such as the St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS and the River Ribble, Lower Tidal Section BHS and Mill Brook BHS. The Outline Code of Construction Practice (CoCP) (document reference J1) includes an Outline Dust Management Plan and an Outline Pollution Prevention Plan that include measures to control dust and any spillages. Given these embedded commitments, the likelihood of adverse impacts on the BHS is low and the impacts would be temporary, localised and reversible. Pollution would not affect the integrity of these sites and the magnitude of impact would be **negligible**.

3.11.6.35 The risk of introducing or spreading INNS will be controlled through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies the application for development consent. The magnitude of impacts associated with spread of INNS at BHSs would be **no change**.

3.11.6.36 For LNR the risk impact of pollution caused by dusts and contaminant release at surface associated with construction vehicles is **negligible** in magnitude and spread of INNS is **no change.**

Significance of the effect

3.11.6.37 Overall, the sensitivity of the receptor is **medium** and the magnitude of the impact associated with the spread of INNS is deemed to be **no change,** and

that with bentonite breakout and pollution at surface is **negligible**. Overall, the effect would be **no change to minor adverse**, which is not significant.

Decommissioning phase

3.11.6.38 During decommissioning, for the BHSs for which trenchless techniques would avoid temporary or permanent habitat loss, cables would either be left *in situ* or removed from link boxes. No new trenching would be required. All works would be in accordance with the Onshore Decommissioning Plan. The magnitude of impact would therefore be no greater than that occurring during construction (**negligible**). This would result in up to a **minor adverse** effect, which is not significant.

The impact of changes in air quality from emissions and deposition

Construction phase

Magnitude of impact

3.11.6.39 Fifteen BHSs and three LNRs meet criteria of screening for impacts from changes in air quality associated with emissions from construction vehicles for the Transmission Assets. Screening criteria are provided in Annex 9.1: Air quality impacts on ecologically designated sites of the ES. The relevant BHSs are listed in **Table 3.10**, which provides information on their location in relation to the road network on which traffic movements have been modelled, reasons for designation and the habitats on which screening is based. Corresponding information on the three LNRs is provided in **section 3.6.1**. Information on predicted construction traffic movements is provided in Volume 3, Chapter 7: Traffic and transport of the ES.

3.11.6.40 The screening criteria for 'Local Sites' in Annex 9.1: Air quality impacts on ecologically designated sites of the ES is whether the long-term PC is greater or less than 100% of the long-term environmental standard. Impacts can be screened out of the PC is less than 100%. The following results were obtained for the relevant pollutants.

- Annual-mean NOx: The maximum annual-mean NOx PC does not exceed 100% of the critical level and the impacts can be screened out as insignificant for all BHS and LNR.
- Daily-mean NOx: The maximum daily-mean NOx PC does not does not exceed 100% of the critical level and the impacts can be screened out as insignificant for all BHS and LNR.
- Annual-mean NH3: The maximum annual-mean NH3 PC does not exceed 100% of the critical level and the impacts can be screened out as insignificant for all BHS and LNR.
- Nutrient N Deposition: The maximum nitrogen deposition PC does not exceed 100% of the critical load and the impacts can be screened out as insignificant for all BHS and LNR.

- Acid Deposition: The maximum acid deposition PC does not exceed 100% of the critical load the impacts can be screened out as insignificant for all BHS and LNR.

3.11.6.41 On this basis the results of the air quality screening, the magnitude of impacts of emissions for all BHSs and LNRs **negligible**.

Significance of the effect

3.11.6.42 The impact associated with changes in air quality from emissions and deposition is negligible. The significance of the effect would therefore be up to **negligible**, which is not significant.

Decommissioning phase

3.11.6.43 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required. The traffic movements associated with decommissioning are therefore unlikely to produce emissions that would result in impacts on the BHS and LNR. The magnitude of impact would be negligible and the significance of effect would also be **negligible.**

Summary of impacts on BHS and LNR

3.11.6.44 Table 3.31 below states the magnitude of each effect for each affected BHS within the 2 km study area of the Onshore Order Limits only. The impacts of changes in air quality on the 15 BHS and three LNR in the vicinity of the modelled road network for construction traffic listed in **Table 3.10** are negligible in all cases and the impact of pollution and INNs is respectively negligible and no change. They are not included in the table.

Table 3.31: Magnitude of impacts on each affected BHS

BHS name	Phase	Habitat loss	Disturbance/ fragmentation	Pollution	INNS
Lea Marsh	Construction	Negligible	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Lytham Foreshore Dunes and Saltmarsh	Construction	Negligible	High (ground water change)	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Mason's Wood	Construction	No change	No change	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
River Ribble, Lower Tidal Section	Construction	Negligible	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Savick Bridge	Construction	Negligible	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change

BHS name	Phase	Habitat loss	Disturbance/ fragmentation	Pollution	INNS
St. Anne's Old Links Golf Course and Blackpool South Railway Line	Construction	Negligible	High (ground water change)	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Howick Hall Ponds	Construction	No change	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Westbury Claypits	Construction	No change	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change
Lytham Moss	Construction	NA	NA	NA	NA
	Decommissioning	NA	NA	NA	NA
Freshfield Farm Pond, North	Construction	High	NA	NA	NA
	Decommissioning	NA	NA	NA	NA
Freshfield Farm Pond, South	Construction	High	NA	NA	NA
	Decommissioning	NA	NA	NA	NA
Mill Brook Valley	Construction	High	Negligible	Negligible	No change
	Decommissioning	No change	No change	Negligible	No change

3.11.6.45 Temporary and permanent habitat loss is no change or negligible during construction at BHS sites where impacts are wholly or largely avoided through trenchless construction techniques and high at sites that are wholly or partially removed. It is no change at decommissioning because cables are either left *in situ* or removed at locations outside the site.

3.11.6.46 Disturbance/fragmentation is negligible or no change at BHS sites with little or no nearby construction activity, largely as a result of nearby trenchless construction techniques, and is assumed to be high at sites that are subject to hydrological change.

3.11.6.47 NA applies at BHS sites that are within the Onshore Order Limits but for which the reasons for designation are not assessed in this chapter, or because impacts cannot occur at sites that are wholly removed during construction.

3.11.6.48 **Table 3.32** summarises information on impacts and significance of effects for the 26 BHS and four LNR that are relevant to the assessment.

Table 3.32: Summary of impacts on BHS and LNR

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction	**BHS**: High at three sites, negligible at five sites, no change at three sites, NA at one site **LNR**: No change	Medium	**BHS**: Moderate adverse at three sites, negligible at five sites, no effect at three sites, NA at one site **LNR**: No effect
Temporary and permanent habitat loss: decommissioning	**BHS**: No change **LNR**: No change	Medium	**BHS**: No effect **LNR**: No effect
Fragmentation, isolation and disturbance: construction	**BHS**: Up to high at two sites, negligible at six sites, no change at one site, NA at three sites **LNR**: No change	Medium	**BHS**: Up to moderate adverse at two sites, negligible at six sites, no change at one site, NA at three sites **LNR**: No effect
Fragmentation, isolation and disturbance: operation and decommissioning	**BHS**: No change **LNR:** No change	Medium	**BHS**: No effect **LNR**: No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	**BHS**: Negligible (bentonite and surface pollution) No change (INNS) **LNR**: Negligible (bentonite and surface pollution) No change (INNS)	Medium	**BHS**: Minor adverse (bentonite and surface pollution) No effect (INNS) **LNR**: Minor adverse (bentonite and surface pollution) No effect (INNS)
Changes in air quality from emissions and deposition.	**BHS**: Negligible at 15 sites, NA at 11 sites **LNR**: Negligible at 3 sites, NA at 1 site	Medium	**BHS**: Negligible at 15 sites, NA at 11 sites **LNR**: Negligible at 3 sites, NA at 1 site

Further (secondary) mitigation and residual effect

3.11.6.49 Further to the embedded mitigation measures proposed in **Table 3.20**, additional measures are proposed to reduce the impacts at BHSs where required. Such measures include, but are not limited to, the following.

The impact of temporary and permanent habitat loss

3.11.6.50 Both Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS, with a combined area of 0.05 ha, are located wholly within land permanently required for the Morgan onshore substation and will be removed. New ponds would be created in an area of approximately 2.08 ha within approximately 330 m of Freshfield Farm Pond, South BHS which is the more distant of the affected BHSs, and in an area of approximately 0.52 ha immediately to the south of Morgan onshore substation. This location is on

the same soil type as the affected BHSs (slightly acid loamy and clayey soils with impeded drainage) and the ponds will be designed, as far as possible, to have the characteristics of those that will be lost. Plant material and substrates, that would contain a proportion of faunal species in the affected ponds, would be translocated to replacement ponds as part of measures to replicate the ecology of those that are lost. There would be a short term moderate adverse until the new ponds are fully established and provide functional habitat. Once established. In the medium term, the replacement ponds would reduce the moderate adverse effect associated with the loss of the BHS to **minor adverse**, which is not significant.

3.11.6.51 In addition, a number of ponds will be provided in addition to the creation of high quality habitat in the surrounding parts of the mitigation area. This has the potential for some beneficial effects, but as a precautionary approach this has been assessed to be **no effect** over the medium term, which is not significant.

3.11.6.52 The Onshore Order Limits include land required for the Morgan/Morecambe National Grid connection works and the National Grid connection compound would remove approximately 1.78 ha of the Mill Brook Valley BHS. To mitigate for potential temporary habitat loss associated with Mill Brook Valley BHS, temporary construction compounds will be micro-sited to avoid the site wherever reasonably practicable (CoT126). Habitat would be reinstated but the impact and effect is long term and there is a risk that habitat of comparable quality cannot be provided or maintained. Therefore, the magnitude of impact would be **high**, resulting an effect of **moderate adverse significance**.

The impact of fragmentation, isolation and disturbance

3.11.6.53 With respect to the St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS and River Ribble, Lower Tidal Section BHS, CoT41 and CoT128 confirms that a hydrogeological risk assessment will be undertaken where practicable where the export cable corridor crosses beneath Lytham St. Annes Dunes SSSI (the same direct pipe will pass beneath the BHSs). This will inform a site-specific crossing method statement of the which will also be agreed with the relevant authorities prior to construction. As stated in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, this will inform the installation depth of the cables, and could reduce the magnitude of the impact to **low**. The effect of changes in hydrology on the BHSs will, therefore, be **minor adverse** which is not significant.

3.11.6.54 An Outline Ecological Management Plan (document reference J6) is provided alongside this ES as part of the application for development consent. This includes an outline of the long term mitigation and management measures relevant to onshore ecology and nature conservation. Ecological Management Plan(s) will be developed in accordance with the Outline Ecological Management Plan, providing further details, will be developed in consultation with the relevant responsible authorities.

3.11.6.55 There is no requirement for secondary mitigation at any of the LNR other than that described for Lytham St. Annes Dunes SSSI and LNR in **section 3.11.4**.

3.11.6.56 **Table 3.33** below summarises the impacts and effects on BHS with secondary mitigation in place.

Table 3.33: Impacts and effects on BHS with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction	High at one site, low at two sites, negligible at five sites, no change at one site.	Medium	Moderate at one site, minor adverse at two sites, negligible at five sites, no effect at one site. Creation of new ponds would result in a temporary minor adverse effect in the short term. In the long term this has the potential for beneficial effects once established but is assessed here as no effect) on a precautionary basis.
Temporary and permanent habitat loss: decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	Low at two sites, negligible at six sites, no change at one site.	Medium	Minor adverse at two sites, negligible at six sites, no effect at one site.
Fragmentation, isolation and disturbance: Operation and decommissioning	No change	Medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse bentonite and surface pollution) No effect (INNS)
Changes in air quality from emissions and deposition.	**BHS**: Negligible **LNR**: Negligible	Medium	**BHS**: Negligible **LNR**: Negligible

3.11.7 Ecological networks

Sensitivity of the receptor

3.11.7.1 The emerging Local Nature Recovery Strategy for Lancashire has identified areas of particular importance for biodiversity, which includes the woodland and grassland ecological networks that have been developed by LERN and the Lancashire Wildlife Trust. These networks form part of the spatial basis for the emerging Local Nature Recovery Network that has the potential to deliver additional benefits for ecological connectivity and enhanced resilience to climate change. Consequently, these networks are of county importance and **medium** sensitivity. Woodland, grassland and heathland and wetland

networks are also a biodiversity consideration in terms of planning and development control at the District and Unitary Authority level.

3.11.7.2 The location and geographical extent of these ecological networks are shown in Figure 1.14 and 1.15 of Volume 3, Annex 3.1: Onshore ecology desk study of the ES.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.7.3 The constituents of ecological networks are defined in **section 3.6.1** above. **Table 3.34** and

3.11.7.4 **Table** 3.35 below summarises the impacts on each constituent of the woodland and grassland ecological networks. 'Core areas' are identified as statutory and non-statutory wildlife sites. Habitat corridors comprise linear sections of habitat which provide ecological connectivity for wildlife within the Onshore Order Limits.

Table 3.34: Temporary and permanent habitat loss - woodland ecological network (ha)

Woodland	Summary	No loss	Temporary loss	Permanent loss
Total in Onshore Infrastructure Area	83.46	-	-	-
Total in 2 km buffer around Onshore Infrastructure Area	1965.87	-	-	-
% within Onshore Infrastructure Area	4.25	-	-	-
Categories of loss from the ecological network:				
> 5 km habitat corridor	-	-	-	-
> 3 km Corridor		9.65	23.41	3.5
0 to 250 m habitat corridor	-	-	0.01	-
250 m to 3 km habitat corridor	-	8.92	33.54	1.4
3 to 5 km habitat corridor	-	-	-	-
Core area	-	1.31	-	-
Stepping stone habitat	-	1.28	0.33	0.12
Total		21.16	57.29	5.02
Proportion of retention and loss	-	25.35%	68.64%	6.01%

Table 3.35: Temporary and permanent habitat loss – grassland ecological network (ha)

Grassland	Summary	No loss	Temporary loss	Permanent loss
Total in Onshore Infrastructure Area	124.76			
Total in 2 km buffer around Onshore Infrastructure Area	2365.74			
% within Onshore Infrastructure Area	5.27%			
Categories of loss from the ecological network:				
> 5 km habitat corridor	-	-	-	-
> 3 km Corridor		7.82	37.38	2.6
0 to 250 m habitat corridor	-	0.05		0.02
250 m to 3 km habitat corridor	-	0.53	5.58	0.05
3 to 5 km habitat corridor	-			
Core area	-	48.75	2.35	0.21
Stepping stone	-	0.6		
Stepping stone habitat	-	5.63	12.92	0.27
Total	-	63.38	58.23	3.15
Proportion of retention and loss	-	50.80%	46.67%	2.52%

3.11.7.5 The use of direct pipe technology for the installation of export cables at the landfall would retain habitat and consequently avoid impacts on the core areas in the Fylde sand dunes. Trenchless crossing techniques also reduce losses at additional locations including to the southeast and southwest of Moss Side, Lea Marsh and along the River Ribble for the grassland ecological network; and Higher Ballam, south of Newton with Scales and at Masons Wood for the woodland ecological network. This is shown in the onshore crossing schedule (Volume 1, Annex 3.2: Onshore crossing schedule of the ES).

3.11.7.6 There would be no permanent loss of core areas in the woodland ecological network or in the > 5 km Corridor. The main causes of permanent losses in the > 3 km habitat corridor and 250 m to 3 km habitat corridor are largely associated with operational access. This is widespread at various locations, typically of small extent and not necessarily requiring new vehicular access. The main causes of temporary loss would be from the onshore export cable corridor, with a construction width of 100 m, the 400 kV grid connection cable corridor, with a construction width of 76 m, and associated compound and access tracks.

3.11.7.7 The largest area of temporary loss of core habitat in the grassland ecological network would be at Mill Brook Valley BHS where 1.18 ha of core habitat is affected, which is discussed in **section 3.11.5.** Various smaller areas recorded as temporary loss of core areas of the grassland ecological network as a result of minor activities such as construction access in these areas that will not affect their ecological characteristics, as also discussed in **section 3.11.5.** As for the woodland ecological network, the main cause of temporary loss from grassland habitat stepping stones and corridors is the construction of the onshore export cable corridor and the 400 kV grid connection cable corridor.

3.11.7.8 According to the MDS, the duration of construction for the installation of the onshore export cables and the 400 kV grid connection cables is 66 months (sequential construction) and therefore the impact is long term. Land will be restored to its original condition, and hedges (using appropriate species for hedging) and drains will be reinstated. Where practicable, consideration will be given to early restoration of sections of the cable route. Therefore, impacts on the woodland and grassland ecological networks are reversible and may take place in a shorter timeframe than stated in the MDS.

3.11.7.9 The presence of areas proposed for ecological mitigation and biodiversity benefit and enhancement results in significant habitat retention. This consists of 73.15 of the grassland habitat network of which approximately 54 ha is included in mitigation areas for birds at Fairhaven and otter at Lea Marsh.

3.11.7.10 Taking account of the very limited proportion of permanent loss from the ecological network and the protection of the large majority of core areas, alongside the commitment to reinstate habitats after construction, it is considered that the magnitude of impacts is limited and would be **negligible** for the woodland ecological network and **low** for the grassland ecological network.

Construction phase: Significance of the effect

3.11.7.11 The overall magnitude of impact on ecological networks would be **low** and therefore the significance of the effect would be **minor adverse**, which is not significant.

Decommissioning phase

3.11.7.12 Where trenchless techniques would avoid temporary or permanent habitat loss, cables would either be left *in situ* or removed from link boxes. No new trenching would be required. The magnitude of impact would therefore be no greater than that occurring during construction (**low** adverse). The effect would be up to **minor adverse**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.7.13 As discussed in relation to permanent and temporary habitat loss, the Lancashire Ecological Network is a conservation strategy intended to maintain the function of the ecosystem in order to support the conservation of species and habitats. It identifies and maps core habitats (designated sites), as well as ‘stepping stone’ habitat and corridors that represent the most ecologically beneficial links between core sites.

3.11.7.14 As also discussed in relation to temporary and permanent loss above, the design of the onshore elements of the Transmission Assets largely avoids core areas. The Onshore Infrastructure Area includes a comparatively greater amount of the corridors and includes a proportion of stepping stone areas for the grassland ecological network, which is more extensive in the vicinity of the Transmission Assets. The majority of the grassland core habitat areas and the corridors between them are located along the coast and the

Ribble Estuary and would not be affected because of the commitment to use trenchless techniques beneath the SSSI and the BHSs in these areas.

3.11.7.15 Most of the potential fragmentation of the ecological network would be long term but temporary and associated with the installation of the onshore export cables and the 400 kV grid connection cables, where a proportion of the trenchless crossings would limit impacts on habitat corridors. A proportion of the fragmentation associated with the onshore substations would be permanent, but this is highly localised.

3.11.7.16 As such, there would be generally temporary and reversible impacts on the ecological network at the local level that would not affect the integrity or have an appreciable effect at the county level. Therefore, the magnitude of impacts is considered to be **negligible.**

Construction phase: Significance of the effect

3.11.7.17 The magnitude of impact on ecological networks would be **negligible** and the significance of the effect would be **minor adverse**, which is not significant.

Decommissioning phase

3.11.7.18 Where trenchless techniques avoid temporary or permanent habitat loss, cables would either be left *in situ* or removed from link boxes. No new trenching would be required. Therefore, any fragmentation associated with decommissioning would not exceed that at construction and the magnitude of impact would be **negligible** with the significance of the effect likely to be up to **minor adverse**, which is not significant.

Summary of impacts on ecological networks

Table 3.36: Summary of impacts on ecological networks

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: Construction and decommissioning	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: Construction and decommissioning	Negligible	Medium	Minor adverse

Further (secondary) mitigation and residual effect

3.11.7.19 No significant effects have been identified and, therefore, no further (secondary) mitigation is required. As set out above, an Outline Ecological Management Plan is submitted as part of the application for development consent, which includes an outline of the mitigation and management measures relevant to onshore ecology and nature conservation. Ecological Management Plan(s) (EMP) will be developed in accordance with the Outline Ecological Management Plan (document reference J6) in consultation with the relevant responsible authorities.

3.11.7.20 The landscape design for the Morgan onshore substation and Morecambe onshore substation will provide new areas of trees, woodland, scrub, meadow grassland and wetland. Nearby, wetland and grassland will be provided to mitigate the loss of two BHSs. There are currently no woodland or grassland stepping stone areas in this location and it is considered that these new habitats may represent one, depending on their relationship with core areas. This has the potential to be beneficial, but precautionarily this has been assessed to be **no effect** over the medium to long term, which is not significant.

3.11.7.21 Residual effects would be as set out in **Table 3.37** below.

Table 3.37: Impacts and effects on ecological networks with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: Construction and decommissioning	Low	Medium	Minor adverse
Permanent habitat creation	No change	Medium	No effect
Fragmentation, isolation and disturbance: Construction and decommissioning	Negligible	Medium	Minor adverse

3.11.8 Ancient woodland

Sensitivity of the receptor

3.11.8.1 Eight ancient woodlands are within 200 m of the road network on which construction traffic has been modelled. Most are situated to the east of the Onshore Order Limits and are listed in **Table 3.11**.

3.11.8.2 The ancient woodland is of national importance and therefore of **high sensitivity**.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase

3.11.8.3 Risks of pollution from dust and runoff from construction vehicles will be controlled by measures in the Outline Code of Construction Practice (CoCP) (document reference J1), which includes an Outline Dust Management Plan (J1.2) and an Outline Pollution Prevention Plan that set out measures to control dust and any spillages. Given these embedded commitments, the likelihood of adverse effects on the ancient woodlands is low and the impacts would be temporary, localised and reversible. The magnitude of impact would be **negligible**.

3.11.8.4 The risk of introducing or spreading INNS will be controlled through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies the application for

development consent. The magnitude of impacts associated with spread of INNS at this SSSI would be **no change**.

Significance of the effect

3.11.8.5 Overall, the sensitivity of the receptor is **high** and the magnitude of the impact associated with the spread of INNS is deemed to be **no change,** and that with dust and pollution is **negligible**. Overall, the effect would be **no effect to minor adverse**, which is not significant.

Decommissioning phase

3.11.8.6 As all areas of ancient woodland are located outside of the Onshore Order Limits, the magnitude of impact on the ancient woodland during decommissioning would be **no change** and the significance of effect is **no effect**.

The impact of changes in air quality from emissions and deposition

3.11.8.7 Eight ancient woodlands meet criteria of screening for impacts from changes in air quality associated with emissions from construction vehicles for Transmission Assets. Screening criteria are provided in Annex 9.1: Air quality impacts on ecologically designated sites of Volume 3, Chapter 9: Air quality of the ES. The relevant ancient woodland sites are listed in **Table 3.11**.

3.11.8.8 The screening criteria for assessment of impacts of emissions on ancient woodland are the same as those used for BHS and LNR as described in **section 3.11.6**, and is whether the long-term PC is greater or less than 100% of the long-term environmental standard. Impacts can be screened out of the PC is less than 100%. As for BHS and LNR, the PCs for the five relevant pollutants are all less than 100% of the applicable load or level for all of the eight ancient woodlands.

3.11.8.9 On this basis the results of the air quality screening, the magnitude of impacts of emissions for all ancient woodlands is **negligible**.

Significance of the effect

3.11.8.10 The impact associated with changes in air quality from emissions and deposition is negligible. The significance of the effect would therefore be **minor adverse**, which is not significant.

Decommissioning phase

3.11.8.11 During decommissioning, cables would either be left in situ or removed from the transition joint bays. No new trenching would be required. The traffic movements associated with decommissioning are therefore unlikely to produce emissions that would result in impacts on ancient woodlands. The magnitude of impact would be negligible and the significance of effect would also be **minor adverse**.

Summary of impacts on ancient woodland

3.11.8.12 As set out above, there would be no loss of ancient woodland habitat. Therefore, there would be no potential for habitat loss or fragmentation impacts to occur.

Table 3.38: Summary of impacts on ancient woodland

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (surface pollution) No change (INNS)	High	Minor adverse (surface pollution) No effect (INNS)
Changes in air quality from emissions and deposition	Negligible	High	Minor adverse

Further (secondary) mitigation and residual effect

3.11.8.13 No significant effects have been identified and, therefore, no further (secondary) mitigation is required.

3.11.8.14 Residual effects would be as set out in **Table 3.38** above.

3.11.9 Veteran trees

Sensitivity of the receptor

3.11.9.1 A single veteran tree has been identified during arboricultural surveys undertaken. It is a pedunculate oak that is close to a hedgerow running east from Howick Hall Wood and is north of Howick Hall Farm. The veteran tree is located within the 400 kV grid connection cable corridor and is irreplaceable and of at least county importance. The sensitivity is therefore **medium**.

3.11.9.2 Further detail regarding trees within the Onshore Order Limits is provided in Volume 3, Annex 10.5: Tree survey and arboricultural impact assessment of the ES. The location of trees, including the veteran tree is provided in Appendix B of Volume 3, Annex 10.5: Tree survey and arboricultural impact assessment of the ES (tree reference ID: T100).

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.9.3 The installation of the 400 kV grid connection cables will be undertaken such that micrositing is used so that tree can be retained, with an appropriate buffer to avoid damage to the crown or root zone (CoT03). Consequently, the veteran tree will not be affected by temporary or permanent habitat loss. The magnitude of impact would therefore be **no change**.

Construction phase: Significance of the effect

3.11.9.4 The magnitude of impact on the veteran tree would be **no change** and the significance of effect would be **no effect**.

Decommissioning phase

3.11.9.5 The magnitude of impact on the veteran tree would be **no change** and the significance of effect would be **no effect**.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.9.6 The provision of an appropriate buffer and other measures identified in Volume 3, Annex 10.5: Tree survey and arboricultural impact assessment of the ES would avoid damage to the crown or root zone. Consequently, the veteran tree will not be affected by fragmentation, isolation and disturbance. The magnitude of impact would therefore be **no change**.

Construction phase: Significance of the effect

3.11.9.7 The magnitude of impact on the veteran tree would be **no change** and the significance of effect would be **no effect**.

Decommissioning phase

3.11.9.8 The magnitude of impact on the veteran tree would be **no change** and the significance of effect would be **no effect**.

The impact of pollution caused by contaminant release, and spread of INNS

Construction phase: Magnitude of impact

3.11.9.9 Risks of pollution, for example from dust and runoff will be controlled by measures in the Outline Code of Construction Practice (CoCP) (document reference J1), which includes an Outline Dust Management Plan (document reference J1.2) and an Outline Pollution Prevention Plan (document reference J1.4) that include measures to control dust and any spillages. Given these embedded commitments, the likelihood of adverse effects on the woodland is low and the impacts would be temporary, localised and reversible. The magnitude of impact would be **negligible**.

Construction phase: Significance of the effect

3.11.9.10 The magnitude of impact on the veteran tree would be **negligible** and the significance of effect would be **negligible**.

Decommissioning phase

3.11.9.11 During decommissioning, no impacts to the tree are anticipated and these could be managed through the Onshore Decommissioning Plan. The magnitude of impact on the veteran tree would be **no change** and the significance of effect would be **no effect**.

Summary of impacts on veteran trees

Table 3.39: Summary of impacts on veteran trees

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction and decommissioning	No change	Medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction	Negligible	Medium	Negligible
Pollution caused by contaminant release, and spread of INNS: decommissioning	No change	Medium	No effect

Further (secondary) mitigation and residual effect

3.11.9.12 No significant effects have been identified and, therefore, no further (secondary) mitigation is required.

3.11.9.13 Residual effects would be as set out in **Table 3.39** above.

3.11.10 Priority habitats

Sensitivity of the receptor

3.11.10.1 The priority habitats present outside of designated sites are coastal and floodplain grazing marsh, purple moor-grass and rush pasture, hedgerows and ponds that are important at up to the county level and therefore of **medium** sensitivity. Others, saltmarsh, sand dunes and mudflats, are present only in designated sites and are of national or county importance and therefore of **high** or **medium** sensitivity in accordance with applicable designations. The location of priority habitats within 2 km of the Onshore Order Limits is provided in Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.10.2 **Table 3.40** summarises the potential retention and loss of priority habitats within the Onshore Infrastructure Area, based on data obtained from the desk study and Phase 1 habitat survey.

Table 3.40: Retention and temporary and permanent loss of priority habitats

Priority habitat	Importance	Sensitivity	Not affected	Temporary loss	Permanent loss	Magnitude
Coastal and floodplain grazing marsh (ha)	County	Medium	17.38	46.72	2.77	Low
Coastal saltmarsh (ha)	National, county	High/ medium	2.03	0.03	0	No change
Coastal sand dunes (ha)	National, county	High/ medium	22.61	-	-	No change
Deciduous woodland	-	-	1.32	0.03	0.08	-
Good quality semi-improved grassland	County (BHS)	-	-	2.24	-	Medium
Mudflats (ha)	National	High	0.73	-	-	No change
Purple moor-grass and rush pasture (ha)	Up to county	Medium	1.71	-	-	No change
Ponds (number)	County	Medium-	31	-	27	Medium-low
Hedgerows (km)	County	Medium	2.73	19.93	5.39	Low

3.11.10.3 The loss of coastal saltmarsh identified above is based on information provided on the MAGIC website. This area is at Lea Marsh BHS is species-poor neutral grassland, as discussed in **section 3.11.5**. An area of 23.31 ha of coastal saltmarsh is within areas for mitigation and will not be adversely affected.

3.11.10.4 There are no impacts in terms of habitat loss for coastal sand dunes. Impacts on mudflats and purple moor-grass and rush pasture are avoided through trenchless techniques. In all cases the effect is **no change**.

3.11.10.5 The area surrounding the Ribble Estuary contains a significant proportion of the coastal and floodplain grazing marsh in Lancashire. Data provided by the

phase 1 habitat survey shows that habitat within the Onshore Order Limits is a mixture of improved and poor semi-improved pasture that, in places, contains a network of ditches and therefore matches the priority habitat description. Other areas identified as coastal and floodplain grazing marsh in the published data were arable with largely dry ditches and do not align well with the description. However, the full extent of coastal and floodplain grazing marsh provided in the published data is considered in this assessment, regardless of quality.

3.11.10.6 The main cause of permanent loss is from operational access routes throughout the Onshore Order Limits. Given the small extent, widely dispersed distribution and limited impact they will have on the habitats present, the magnitude of impact is considered to be low. The main cause of temporary loss of coastal and floodplain grazing marsh is the installation of the onshore export cables and the 400 kV grid connection cables. According to the MDS the duration of construction for the installation of the onshore export cable and the 400 kV grid connection cables is 66 months (sequential construction) and therefore long-term. Land will be restored to its original condition and hedges (using appropriate species for hedging) and drains will be reinstated following construction. Where practicable, consideration will be given to early restoration of sections of the cable route. Therefore, impacts on coastal and floodplain grazing marsh are reversible and may take place in a shorter timeframe than stated in the MDS. In addition, the onshore crossing schedule (Volume 1, Annex 3.2: Onshore crossing schedule of the ES) sets out areas which will be crossed by trenchless techniques. This includes areas of coastal and floodplain grazing marsh, in particular around Moss Side and certain areas of the 400 kV grid connection cable corridor (see Figure 1.13 of Volume 3, annex 3.1: Onshore ecology desk study of the ES). The magnitude of impacts on coastal and floodplain grazing marsh is consequently **low.** An area of 26.35 ha of coastal and floodplain grazing marsh is within areas for mitigation and biodiversity benefit and will not be adversely affected. The impact on breeding and wintering birds that may be associated with the loss of coastal and floodplain grazing marsh priority habitat and any loss of peat soils are discussed separately in Volume 3, Chapter 4: Onshore and intertidal and ornithology of the ES and Volume 3, Chapter 6: Land use and recreation of the ES.

3.11.10.7 The permanent loss of hedgerows is predominantly associated with the land permanently required for the Morgan and Morecambe onshore substations and associated permanent access, as well as the Morgan/Morecambe National Grid connection works. Elsewhere there would be some loss of hedgerows for operational access tracks, but of a lesser extent than for the onshore substations. The stated permanent loss for hedgerows (5.39 km) represents the worst case, as the Applicants propose to provide hedgerows of high ecological value. As for coastal and floodplain grazing marsh, the main cause of temporary loss of hedgerows would be the installation of the onshore export cables and the 400 kV grid connection cables, for which the duration of construction for the installation of the onshore export cable and the 400 kV grid connection cables is 66 months (sequential construction), followed by a period of establishment of the reinstated hedgerows. The proposal for reinstatement of hedgerows where practicable will mean that

loss of hedgerows is long term but reversible. The loss of the resource of hedgerows affected by temporary habitat loss is not considered to represent an impact on conservation status at more than the local scale and the magnitude of impact would be **low** and adverse.

3.11.10.8 The main location of temporary loss of good quality semi-improved grassland is within the Mill Brook Valley BHS. This is impact is **high** and adverse as described in **section 3.11.6.**

3.11.10.9 The loss of ponds will be permanent. As discussed in **section 3.11.6** two ponds that are designated separately as BHS will be removed. **Section 3.11.16** identifies five ponds, including the two BHS, that are of importance for aquatic invertebrates, however, one of those designated as BHS no longer supports the assemblage present at the time of designation. Two additional ponds to those designated BHSs are wholly within the Onshore Order Limits and will be permanently removed. Based on the findings of surveys, which scoped out 26 waterbodies for their potential invertebrate interest, sites with comparable ecological value are uncommon. GCN have been recorded in a total of 13 ponds when survey results provided in **Table 3.15** and desk study records are combined, of which six are removed. On the basis of this information it is likely that:

- four ponds qualify as priority habitat on the basis of invertebrate assemblages of which three are removed;
- six ponds will be removed that qualify as priority habitat based on the presence of GCN, a fully protected species; and
- of the six waterbodies containing GCN that are removed, two are also important for invertebrates.

3.11.10.10 Based on the data, eight ponds likely to qualify as priority habitat are removed. The magnitude of impact from the loss of these ponds is **high** adverse in each case. The magnitude of the loss of the remaining ponds is **low**.

Construction phase: Significance of the effect

3.11.10.11 The magnitude of loss of good quality semi-improved is high on accordance with the applicable designation and the significance is **moderate** and adverse. The loss of five ponds qualifying as priority habitat is of **moderate** and adverse significance in each case.

3.11.10.12 The magnitude of impact on the remaining priority habitats affected by temporary and permanent habitat loss is **low** and therefore the significance of the effect is **minor adverse**, which is not significant.

3.11.10.13 For the remaining priority habitats, the magnitude of impact would be **no change** and **no effect** would arise, which is not significant.

Decommissioning phase

3.11.10.14 During decommissioning, in cases where habitat loss has been avoided through trenchless techniques, cables would either be left *in situ* or removed from link boxes. No new trenching would be required. The magnitude of

impact would therefore be no greater than that occurring during construction (**no change**). There is **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.10.15 The installation of cables and associated dewatering during construction may result in hydrogeological change and adverse impacts on dune slacks and the wetland plant communities they contain. These impacts are of relevance to sand dune priority habitat and are discussed fully in the assessments of impacts on statutory and non-statutory sites for which sand dunes are a reason for designation in **section 3.11.4** and **section 3.11.5.** These sites are Lytham St Annes Dunes SSSI and LNR, the St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS and Lytham Foreshore Dunes and Saltmarsh BHS.

3.11.10.16 The largely temporary loss of approximately 25 km of hedgerows would result in a reversible but long-term reduction in habitat connectivity, for which the magnitude of impact is considered to be **low** and adverse. Assessment of potential impacts of habitat fragmentation in relation to bats is provided in **section 3.11.11.**

Construction phase: Significance of the effect

3.11.10.17 The magnitude of impact is **low** and therefore the significance of the effect is **minor** and adverse, which is not significant.

Decommissioning phase

3.11.10.18 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays and link bays. No new trenching would be required and no works within the dunes are proposed.

3.11.10.19 In the event that cables are removed, all decommissioning works would be undertaken in accordance with the Onshore Decommissioning Plan. Therefore, no temporary or permanent habitat loss is predicted. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.10.20 Priority habitats have been recorded within and outside of statutory and non-statutory wildlife sites. They are widely distributed throughout and adjacent to the Onshore Order Limits. Construction activity will take place in close proximity to the range of priority habitats that have been identified, as listed in **Table 3.17.** Ponds, purple moor grass and rush pasture, saltmarsh, sand dunes, mudflats and the wetland component of coastal and floodplain grazing marsh are vulnerable to pollution from dust, runoff and release of

contaminants that could occur during surface works at compounds and substations, and along the route of cable corridors.

3.11.10.21 The Outline Code of Construction Practice (CoCP) (document reference J1) includes an Outline Dust Management Plan and an Outline Pollution Prevention Plan that include measures to control dust and any spillages. Given these embedded commitments, the likelihood of adverse effects on priority habitats is low and the impacts would be temporary, localised and reversible. Pollution would not affect the integrity of these sites and the magnitude of impact would be **negligible**.

3.11.10.22 Several priority habitats within and close to the Onshore Order Limits, and particularly wetland and grassland habitats are vulnerable to the spread of INNS. The introduction or release of INNS to any watercourse or waterbody would be reversible at the local level but, if unmanaged, could adversely affect the conservation status of the habitat in the long term. This could readily occur during the movement of machinery and materials but will be avoided. However, the risk of introducing or spreading INNS will be avoided and controlled through the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as an annex to the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies the application for development consent. The magnitude of any impacts associated with the release or spread of INNS priority habitats would be **no change.**

Construction phase: Significance of the effect

3.11.10.23 Sensitivity of the receptor is **high** or **medium** and the magnitude of the impact is **negligible** at most. The effect will, therefore, be of up to **minor adverse** significance, which is not significant.

Decommissioning phase

3.11.10.24 During decommissioning, for the priority habitats for which trenchless techniques will avoid temporary or permanent habitat loss, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. The magnitude of impact will therefore be no greater than that occurring during construction (**negligible**). This would be **minor adverse**, which is not significant.

Summary of impacts on priority habitats

Table 3.41: Summary of impacts on priority habitats

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction	High: ponds, good quality semi-improved grassland Low: two habitats No change: four habitats	High/medium	Moderate adverse Minor adverse: two habitats No effect: four habitats
Temporary and permanent habitat loss: decommissioning	No change	High/medium	No effect
Fragmentation, isolation and disturbance: construction	Low	High/medium	Minor adverse
Fragmentation, isolation and disturbance: decommissioning	No change	High/medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (surface pollution) No change (INNS)	High/medium	Minor adverse (surface pollution) No effect (INNS)

Further (secondary) mitigation and residual effect

3.11.10.25 Further to the embedded mitigation measures proposed in **Table 3.20**, an Outline Ecological Management Plan (document reference J6) is provided alongside this ES as part of the application for development consent. This includes an outline of the long term mitigation and management measures relevant to onshore ecology and nature conservation. EMPs will be developed in accordance with the Outline Ecological Management Plan, providing further details, will be developed in consultation with the relevant responsible authorities.

3.11.10.26 Landscape planting is proposed at the onshore substation sites, which will further contribute to ensuring that the impact with regards to overall habitat loss is minimised.

3.11.10.27 New ponds will be created in advance of construction at locations with a combined area of 2.5 ha south and west of Morgan Substation and 0.8ha at Moss Side. They will provide mitigation provided for Freshfield Pond South BHS and Freshfield Pond North BHS described in **section 3.11.6** will provide further pond and wetland habitat to mitigate for the loss of other ponds of high ecological quality. Ponds are discussed Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES, which notes that small ponds are a common feature in the undeveloped parts of the Onshore Order Limits and reflect the low permeability glacial till that dominates the surface geology. Therefore, these locations are likely to be suitable for pond creation and that they can be established in the medium term. CoT31 provides a commitment

to further reduce the loss of ponds through micro-siting of the onshore export cable corridor and 400 kV grid connection corridor where reasonably practicable, meaning that the stated loss of ponds is likely to reduce.

Table 3.42: Impacts and effects on priority habitats with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction	High: good quality semi-improved grassland Low: three habitats No change: four habitats	Medium	Moderate adverse Minor adverse: three habitats No effect: four habitats
Fragmentation, isolation and disturbance: construction	Low	High/medium	Minor adverse
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (surface pollution) No change (INNS)	High/medium	Minor adverse (surface pollution) No effect (INNS)

3.11.11 Bats

Sensitivity of the receptor

3.11.11.1 At least seven different species of bat have been recorded, including brown long-eared bat, common pipistrelle, Leisler's bat, *Myotis* sp., Nathusius' pipistrelle, noctule, and soprano pipistrelle. Intensive bat roost surveys of trees and buildings have been carried out and limited potential for roosting bats was recorded (see Volume 3, Annex 3.11: Bat roost survey technical report of the ES). A roost for hibernating noctule bats and which is assumed to be regularly used, has been recorded outside of the Onshore Order Limits immediately west of Higher Penwortham. A maternity roost of Daubenton's bat has been recorded close to Dow Brook and a short distance north of Preston New Road. The greatest average number of bats per night and the greatest number of species was recorded to the south of Kirkham, on a hedgerow 280 m north of the Onshore Order Limits (in proximity to Morgan onshore substation).

3.11.11.2 The bat assemblage recorded within the Onshore Order Limits and surrounding survey area is of **medium** sensitivity, due to the presence of a confirmed roost that is assumed to be regularly used, in accordance with BHS selection criteria, and because species that are rarer or have a more restricted distribution in northern England were recorded.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.11.3 Habitat loss associated with the installation of the 400 kV grid connection cables north of A584 Preston New Road to the east of Freckleton and

permanent and temporary habitat loss associated with the Morecambe onshore substation and associated access provision has been minimised through the use of trenchless techniques for the crossings of the Dow Brook in this area. Some temporary loss, for construction and permanent access to the substation, will still be necessary. Dow Brook is likely to be used for foraging and commuting by the maternity colony of Daubenton's bats at this location. It is possible that bats would be able to access foraging habitat on the opposite side of the A584 but the long-term fragmentation of more accessible habitat would be an adverse impact of **medium** magnitude.

3.11.11.4 It is considered that noctule bats would be affected by temporary but habitat loss around the existing Penwortham National Grid substation which includes grassland, scrub, trees and woodland. The duration of construction of 66 months and time required for comparable vegetation to establish means that habitat loss is long term while the impacts on bats would be apparent in a shorter period. It is unlikely that they would continue to use the hibernation roost that is located in woodland adjacent to land required for the National Grid connection compound. The magnitude of impact is **medium**.

3.11.11.5 The construction of the Morgan onshore substation and associated access would result in the permanent loss of grassland, treelines and hedgerows close to an area with relatively high species diversity and relatively high levels of bat activity south of Kirkham and would disrupt bat activity in this area. Habitat loss has been minimised through trenchless techniques to retain groups of trees forming part of a treeline to the west of the substation that provides roosting, foraging and commuting opportunities for bats. However, the magnitude of impact of localised habitat loss, which would reduce resources for bats, is considered to be **medium** and adverse.

3.11.11.6 Construction throughout the Onshore Infrastructure Area will involve the removal of trees with potential for roosting bats which are identified Volume 3, Annex 3.11: Bat roost survey technical report of the ES. The loss of a roost the associated potential for killing and injuring bats would be of up to **medium** magnitude and adverse.

Construction phase: Significance of the effect

3.11.11.7 The impact of habitat loss would be of **medium** adverse magnitude on a bat assemblage of **medium** sensitivity. This would result in effects of **moderate adverse** significance, which is significant. See **paragraph 3.11.11.18** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Decommissioning phase

3.11.11.8 During decommissioning, in cases where habitat loss has been avoided through trenchless techniques, cables will either be left *in situ* or removed from link boxes. No new trenching will be required, and no new habitat loss is likely. The magnitude of impact will therefore be **no change**. There is **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.11.9 As discussed above, permanent and temporary habitat loss for the construction of the Morgan and Morecambe onshore substations and the 400 kV grid connection cables will reduce foraging resources for the maternity roost of Daubenton's bat near Freckleton, the noctule roost at Penwortham and for the bat assemblage associated with habitats south of Kirkham, which are of **medium** magnitude. The impact of fragmentation and disturbance on bat populations associated with these areas would be of the same magnitude.

3.11.11.10 More generally, based on the available data from both desk study (see Volume 3, Annex 3.1: Onshore ecology desk study of the ES) and survey information (see Volume 3, Annex 3.10: Bat activity survey technical report of the ES) it is not considered that long term and widespread but temporary habitat fragmentation would have adverse impacts on bats. Following construction, land along the cable corridor will be restored to its original condition, and hedges (using appropriate species for hedging) and drains will be reinstated. Where practicable, consideration will be given to early restoration of sections of the cable route. In addition, the onshore crossing schedule (Volume 1, Annex 3.2: Onshore crossing schedule of the ES) sets out trenchless locations including areas that are important for bats (e.g. hedgerows, woods and tree lines which act as flight lines) and therefore the magnitude of impacts is **low**.

3.11.11.11 There is also potential for night time lighting during construction of the substation that would contribute to habitat disturbance and fragmentation. This will be controlled through the CoCP. An Outline Construction Artificial Light Emissions Management Plan (document reference J1.11) is included as part of the Outline Code of Construction Practice (CoCP) (document reference J1). Construction site lighting will only operate when required and will be positioned limit impacts on sensitive ecological receptors, including bats, as far as practicable. Construction site lighting will be designed in accordance with latest relevant available guidance and legislation and the details of the location, height, design and luminance of lighting to be used will be detailed within the final CoCP. This will ensure the impact of lighting of **low** magnitude.

Construction phase: Significance of the effect

3.11.11.12 The localised habitat fragmentation will result in an impact of **medium** magnitude on the affected bat population and assemblage comprising a maternity roost of Daubenton's bat near Freckleton and for the bat assemblage associated with habitats south of Kirkham which are of medium sensitivity. The effect is **moderate adverse**, which is significant. See **paragraph 3.11.11.18** for further (secondary) mitigation measures proposed to reduce the significance of effect.

3.11.11.13 Over the wider area, the magnitude of impact is low and therefore the significance of effect would be **minor adverse**, which is not significant.

Operation and maintenance phase

3.11.11.14 Maintenance required during the operational phase of the onshore export cables and 400 kV grid connection cables has no potential for significant effects on bats.

3.11.11.15 The onshore substations will be unmanned but, when required, they will be lit by motion activated security lighting around the perimeter fence and standard car park lighting, with task related lighting where necessary. The illumination would be infrequent but may affect the ability of bats to utilise nearby foraging and commuting habitat, the latter resulting in habitat severance that would affect the ability of bats to access resources over a wider area. On a precautionary basis the impact is considered to be of **medium** magnitude on a bat assemblage of **medium** sensitivity, and is of **moderate adverse** significance, which is significant. See **paragraph 3.11.11.18** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Decommissioning phase

3.11.11.16 During decommissioning, in cases where habitat loss has been avoided through trenchless techniques, cables will either be left *in situ* or removed from link boxes. No new trenching will be required and there would be no impacts. Therefore, the magnitude of impact is **no change**, resulting in **no effect**.

3.11.11.17 It is possible that decommissioning of the onshore substations would involve night time lighting that could result in habitat disturbance and fragmentation for bats. Lighting would be controlled through the Onshore Decommissioning Plan. On a precautionary basis the impact is considered to be of **low** magnitude on a bat assemblage of **medium** sensitivity, and is of **minor adverse** significance, which is not significant.

Summary of impacts on bats

Table 3.43: Summary of impacts on bats

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and associated risk of killing and injury	Medium	Medium	Moderate adverse
Temporary and permanent habitat loss: decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction, operation and maintenance and decommissioning	Medium (maternity roost of Daubenton's bat near Freckleton, noctule hibernation roosts at Penwortham and for the bat assemblage associated with	Medium	Moderate adverse (maternity roost of Daubenton's bat near Freckleton, noctule hibernation roosts at Penwortham and for the bat assemblage associated with habitats south of Kirkham)

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
	habitats south of Kirkham) Low (wider bat population).		Minor adverse (wider bat population).
Fragmentation, isolation and disturbance: and operation and maintenance	Up to medium (lighting)	Medium	Up to moderate adverse (lighting)
Fragmentation, isolation and disturbance: decommissioning	Low	Medium	Minor adverse

Further (secondary) mitigation and residual effect

3.11.11.18 Further to the embedded mitigation measures proposed in **Table 3.20**, additional measures are proposed to reduce the impacts on bats where required. Such measures include but are not limited to the following.

Impact of temporary and permanent habitat loss

3.11.11.19 Secondary measures identified include the development of an Ecological Management Plan in accordance with the Outline Ecological Management Plan (document reference J6). Additionally, an Outline Landscape Management Plan (document reference J2) has been prepared and is submitted with the application for development consent, which describes the proposals for mitigation planting at the onshore substations that will include woodland, scrub, hedgerow, grassland and wetland habitats, as well as treelines along boundaries and operational access routes. This planting will supplement habitat that is retained though trenchless techniques in the vicinity of areas affected be permanent habitat loss that are close to known roosts and commuting habitat.

3.11.11.20 The Outline Ecological Management Plan (document reference J6) also describes the precautionary measures to avoid killing and injury of bats where work is carried out in and close to habitats that they use. Where necessary, any works that are considered to result in adverse effects on favourable conservation status will be carried out under a protected species mitigation licence.

Impact of fragmentation, isolation and disturbance

3.11.11.21 The Ecological Management Plan will include detail of any long-term mitigation and management measures relevant to onshore ecology and nature conservation and will be developed in consultation with the relevant responsible authorities. It will contain details on how permanent loss of habitat of value for bats from the construction of the Morgan and Morecambe onshore substations will be addressed through habitat creation and restoration. It will contain information on the type and location of supplementary roosts to compensate for the disturbance of the noctule roost present at Penwortham. The proposed location is a strip of woodland along the Howick Hall Lane that is connected to Howick Hall Wood. This area is

approximately 260 m from the National Grid construction compound. The 400 kV grid connection cable corridor passes under the proposed location but the during of work is assumed to be shorter, meaning it would provide a viable alternative roost site. The Design Principles document will set out guidance in relation to control of operational lighting, which will be low level. Implementation of a detailed design that aligns with the Design Principles document will ensure that levels of light spill on to bat roosting, foraging and commuting habitats are not significant. An Outline Design Principles document is provided as part of the application for development consent (document reference J3).

3.11.11.22 As described in the Outline Ecological Management Plan (document reference J6), to mitigate the impact of fragmentation and isolation on the Daubenton's maternity roost identified near Freckleton associated with construction of the Morecambe onshore substation, a suitably sized culvert is proposed within Dow Brook to ensure Daubenton's bat will be able to continue to use the brook as a flightline and foraging habitat. The final design of this mitigation will be refined and agreed with stakeholders post consent as part of the final EMPs.

Table 3.44: Impacts and effects on bats with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction	Low	Medium	Minor adverse
Temporary and permanent habitat loss: decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: all phases	Low	Medium	Minor adverse

3.11.12 Great crested newt

Sensitivity of receptor

3.11.12.1 Positive records of GCN have been obtained from the desk study and eDNA surveys carried out within the Onshore Order Limits (see Volume 3, Annex 3.8: Great crested newt and reptile survey technical report of the ES). The distribution of records indicates that there are likely to be two indicative metapopulations of GCN which are located between Warton and Kirkham and west of Higher Penwortham. Identification of these metapopulation takes into account the criteria for BHS selection for GCN which are referred to in **section 3.6.1**. Elsewhere records are more scattered the presence of additional potential metapopulations is not known These records do not provide information on population size, and the two locations are assumed to support 'good' populations as defined in the BHS selection criteria for Lancashire as described in **section 3.6.1**, each of which is of county importance and **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.12.2 An indicative metapopulation between Warton and Kirkham is present in a group of 110 waterbodies in for which there are 18 records of GCN from eDNA and desk study records. Fourteen waterbodies, in which presence has been confirmed in three will be removed for the construction of the onshore export cable, 400 kV grid connection cable and the Morgan and Morecambe onshore substations. One pond will be retained within the biodiversity benefit area. Approximately 8.67 ha of potentially suitable habitat consisting almost entirely of species poor neutral grassland which is widespread will be removed and 2.02 ha retained. The magnitude of loss of ponds and terrestrial habitat is **high**.

3.11.12.3 An indicative metapopulation is present in a group of 54 waterbodies west of Higher Penwortham and north of Hutton. There are 247 records from eDNA and desk study records from these waterbodies. Seven waterbodies in which the presence of GCN has been confirmed in three will be removed for the 400 kV grid connection cable and construction compound at Penwortham National Grid Substation. There is temporary loss of 17.43 ha of suitable terrestrial habitat that largely consists of neutral grassland, and retention of 1.45 ha. The magnitude of loss of ponds and terrestrial habitat is **high**.

3.11.12.4 The loss of ponds throughout the Onshore Infrastructure Area will be permanent though new ponds will be created in advance of construction at locations south and west of Morgan onshore substation and immediately west of Higher Balham. Consequently, the number and location of ponds will differ and this is likely to result in permanent changes in the distribution of GCN in the vicinity of the Transmission Assets. Except for land permanently required for substations, the magnitude of permanent loss of suitable terrestrial habitat is **negligible**.

3.11.12.5 The duration of work for the onshore export cables and 400 kV grid connection cable and associated activities will be temporary but long term for up to 66 months in each case and 60 months for the substations. Terrestrial habitats will be reinstated following construction.

Construction phase: Significance of the effect

3.11.12.6 Each GCN metapopulation is of **medium** sensitivity. Based on impacts described above the significance of effects is **moderate adverse, which is significant** for the two metapopulations. See **paragraph 3.11.12.18** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Decommissioning phase

3.11.12.7 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required to remove cables. The magnitude of impact will therefore be **no change**. There is **no effect**, which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.12.8 Permanent and temporary habitat loss caused by the installation of the 400 kV grid connection cables, the access tracks for these cables and the National Grid connection compound would result in the loss and fragmentation of neutral grassland and hedgerow habitat that provides connectivity between unaffected ponds associated with the metapopulation of GCN between Warton and Kirkham and at Penwortham.

3.11.12.9 The impact of fragmentation, isolation and disturbance and associated killing and injury of a proportion of GCN is **high** and adverse for both affected metapopulations.

Construction phase: Significance of the effect

3.11.12.10 Each GCN population/metapopulation is of medium sensitivity and the magnitude of the impact is **high**. Consequently, the significance of the effect is **moderate adverse** in each case, which is significant. See **paragraph 3.11.12.19** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Decommissioning phase

3.11.12.11 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. The magnitude of impact will therefore be **no change**. There is **no effect**, which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.12.12 GCN are vulnerable to pollution, particularly if it affects waterbodies used for breeding. There is a risk that the use of bentonite and other drilling materials could affect water quality and have adverse impacts on affected metapopulations. Risks are limited by the low permeability of the underlying geology and likely dependence on surface water to maintain ponds and other water bodies, as described in Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Additionally, control of pollution of this kind will be provided by the Bentonite Breakout Plan. An Outline Bentonite Breakout Plan is included as part of the Outline Code of Construction Practice (CoCP) (document reference J1).

3.11.12.13 There are further risks of pollution, for example from dust, runoff and sedimentation, particularly close to construction compounds that will contain construction materials and soil stockpiles. A Dust Management Plan and Pollution Prevention Plan will be used to control these risks. Outline plans are provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). Given these embedded commitments, the

likelihood of adverse effects on GCN is low and the magnitude of impact would be **negligible**.

3.11.12.14 GCN are vulnerable to INNS and pathogens. Colonisation by non-native aquatic plant species, such as swamp stonecrop *Crassula helmsii,* can change the characteristics of GCN breeding habitat, and they are susceptible to a recently introduced fungal infection. Movement of vehicles and materials and works within aquatic habitat represent a risk of introducing or spreading INNS and pathogens.

3.11.12.15 The risk of spread of INNS and pathogens will be controlled by the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts from the spread of INNS will be **no change**.

Construction phase: Significance of the effect

3.11.12.16 The sensitivity of the receptor is **medium** and the magnitude of the impact associated with bentonite breakout and that with pollution at surface is **negligible**, and that of the spread of INNS will be **no change**. Overall, the effect will be **minor adverse**, which is not significant.

Decommissioning phase

3.11.12.17 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. Any potential pollution will be controlled through the Onshore Decommissioning Plan. The magnitude of impact will be **negligible** and the significance would be **minor adverse**, which is not significant.

Summary of impacts on great crested newt

Table 3.45: Summary of impacts on great crested newt

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction	High	Medium	Moderate adverse
Temporary and permanent habitat loss: decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	High	Medium	Moderate adverse
Fragmentation, isolation and disturbance: decommissioning	No change	Medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)

Further (secondary) mitigation and residual effect

The impact of temporary and permanent habitat loss, and the impact of fragmentation, isolation and disturbance

3.11.12.18 Further to the primary and tertiary mitigation measures proposed in **Table 3.20**, the principal additional measure to reduce the impacts on GCN is through contribution to Lancashire's DLL scheme for GCN (CoT92). The Applicants have discussed this approach with stakeholders at an EWG meeting in September 2023. Natural England stated that they broadly agree with the approach to the use of the DLL. Adoption of the DLL approach will ensure that measures are put in place that will have an overall beneficial impact for GCN conservation at the landscape level. These measures are likely to take place outside of the Onshore Order Limits. With this in place, there will be no long term adverse impacts on the GCN metapopulations affected by the Transmission Assets.

3.11.12.19 Further measures that will contribute to mitigation for GCN are as follows:

- pond creation proposed as mitigation for the loss of BHSs in **section 3.11.5**; and
- the Ecological Management Plan (CoT76), which will include detail of long term mitigation and management measures relevant to onshore ecology and nature conservation and will be developed in consultation with the relevant responsible authorities. An Outline Ecological Management Plan is provided as part of the application for development consent (document reference J6). This includes general requirements for dewatering of ponds and removal of other GCN habitat, and working in proximity to retained GCN habitat, that will reduce impacts of habitat fragmentation, disturbance and killing/injury of GCN as far as reasonably practicable.

3.11.12.1 **Table 3.46** below summarises the impacts and effects on GCN with secondary mitigation in place.

Table 3.46: Impacts and effects on great crested newt with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss, including risk of killing and injury: all phases	No change (permanent)	Medium	No effect (permanent)
Fragmentation, isolation and disturbance: all phases	No change (permanent)	Medium	No effect (permanent)
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning (temporary)	Negligible (surface pollution) No change (INNS)	Medium	Minor adverse (surface pollution) No effect (INNS)

3.11.13 Sand lizard

Sensitivity of receptor

3.11.13.1 An introduced population of sand lizard is present in dunes at the Ribble Estuary SSSI and Lytham St Annes Dunes SSSI. This species is not a reason for designation of either SSSI, but the population is part of a recognised reintroduction program that is understood to have been carried out to extend the range of sand lizard in Merseyside to the north of the Ribble Estuary. It is of regional importance and **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.13.2 Installation of the export cables at Lytham St Annes Dunes SSSI will be undertaken by direct pipe (CoT44). This trenchless technique to install the cables between the transition joint bays and the exit pits will pass beneath the foredune habitat in the Ribble Estuary SSSI that supports the majority of the population of sand lizard. The minimum distance between the compounds for the cable exit pits on North Beach and the front of the dune system will be 100 m. Consequently, there will be no habitat loss that would affect the population of sand lizard and the magnitude of impact is **no change**.

Construction phase: Significance of the effect

3.11.13.3 The magnitude of impact on sand lizard is **no change** on a population of **medium** sensitivity. There is **no effect** which is not significant.

Decommissioning phase

3.11.13.4 During decommissioning, cables may remain *in situ* or be removed from the transition joint bays. No trenching would be required in the dunes area. Therefore, there will be no temporary or permanent habitat loss that could affect the population of sand lizard. The magnitude of impact is **no change** and there is **no effect,** which is **not significant**.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.13.5 Sand lizards require areas of sandy substrates with a southerly aspect as part of a mosaic of open and vegetated areas. Sandy areas are necessary for construction of burrows that are used throughout most of the year for breeding and hibernation, as well as for shelter and protection from predation. Burrows are narrow and up to one meter deep.

3.11.13.6 Based on information on sand lizard distribution in the form of population density maps for 2022 and 2023, the main distribution of the population extends north from Highbury Road West for a distance of approximately 750 m. Records appear to be more concentrated in the northern part of this

area in 2023 and there are outlying records further north in both years. The location of reptile records, including sand lizard in relation to the Onshore Order Limits is presented in Figures 18A – 18D of Volume 3, Annex 3.1: Onshore ecology desk study technical report of the ES.

3.11.13.7 The use of the direct pipe trenchless technique to install the six export cables between the transition joint bays at the landfall and the exit pits exit pit on North Beach, with a minimum distance of 100 m from the edge of Lytham St Annes Dunes SSSI, will ensure that cables pass beneath the habitat where the population of sand lizard is present. As such, there will be no loss of habitat in this area but drilling for installation of the cables may cause substrates to move if they are unstable or produce vibration. Both could cause sand lizard burrows to collapse, which could trap and kill adult, juvenile and hatchling sand lizards and stop the development of their eggs. Piling for cofferdams on North Beach to allow dry excavations for the exit pits is another potential source of vibration.

3.11.13.8 Information on the location and distance, duration, extent, depth and methods and of construction activities relevant to the assessment of disturbance on the sand lizard population, based mainly on the MDS (**Table 3.21**) and Volume 1, Chapter 3: Project description of the ES, is summarised below.

- The main source of disturbance is the compounds for the cable exit pits on North Beach which will be located a minimum distance of 15 m from the front of the dune system in the Ribble Estuary that provides habitat for sand lizard, through the locating of the exit pits at least 100 m seaward from Lytham St Annes Dunes SSSI (CoT44).
- Within an overall sequential construction window of 36 months, the duration of activity at the compounds for the cable exit pits on North Beach will be 2 weeks per circuit. It is assumed that all activities that result in vibration of sufficient intensity to affect sand lizard habitat will take place during this period. It will therefore affect only part of the annual cycle of activity for sand lizards, which may include periods when they are highly dependent on burrows for breeding and hibernation.
- Based on information on sand lizard distribution, the Onshore Order Limits cover the central and northern part of current distribution. There are extensive areas of contiguous, potentially suitable but unoccupied habitat immediately to the north of both the current sand lizard distribution and of the Onshore Order Limits. Therefore, a large and significant proportion of the population is potentially vulnerable to the impacts of disturbance but opportunities for expansion and recolonisation are present.
- The MDS confirms that the minimum drill depth is 10 m and maximum drill depth is 30 m at its deepest point. Therefore, there is no risk of direct contact with burrows during drilling beneath the dune habitat and there is a significant depth of substrate that would absorb vibration and reduce risk of impacts on sand lizard.
- Direct pipe has been chosen as the method of construction because it reduces risks associated with frack out of drilling fluids or the collapse of

the drill hole if unsuitable ground conditions are encountered along the drill profile. The drilling for and installation of the cable ducts will take place in a single operation, which reduces vibration. Bentonite would be used in the installation of the cable ducts and neoprene used as a protective layer around them. Both are effective in dampening vibration, which will have the additional effect of minimising disturbance.

3.11.13.9 Overall, based on the information provided above, the location and distance, timing and duration and extent of construction activities associated with the installation of cables by direct pipe could result in significant disturbance of the sand lizard population. However, the depth of cables and method of installation means that adverse impacts are unlikely to occur. The piling required for the exit pits is the only source of disturbance considered, on a precautionary basis, to have a temporary impact that could affect part of the sand lizard population. The magnitude of impact would be **medium**.

Construction phase: Significance of the effect

3.11.13.10 The sensitivity of the receptor is **medium** and the magnitude of the impact is **medium**. The effect will, therefore, be **moderate adverse**, which is significant. See **paragraph 3.11.13.19** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Operation and maintenance phase

3.11.13.11 Maintenance of the export cables will be undertaken only as required. Corrective activities will be limited and undertaken from transition joint bays. No new trenching would be required. Therefore, the magnitude of impact is **no change** and there will be **no effect**.

Decommissioning phase

3.11.13.12 During decommissioning, cables will either be left *in situ* or removed from the transition joint bays. No new trenching will be required but removal of cables could result in disturbance to substrates used by sand lizard for the construction of burrows. It is unlikely that piling required for the construction of the exit pits would take place for decommissioning. Impacts on the dunes and sand lizards could be effectively controlled through the Onshore Decommissioning Plan. Therefore, any impact and effect would be **negligible** and not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.13.13 The majority of the population of sand lizard is present in foredune habitat in the Ribble Estuary SSSI. The use of direct pipe to install the offshore cable between the transition joint bays at the landfall and the exit pits at or above MHWS will pass beneath this habitat. The area of habitat used by sand lizards would be 15 m from the proposed working area for offshore export cables on North Beach and approximately 75 m north of a small compound

occupying part of an existing carpark close to Todmordan Road. Sand lizards are potentially vulnerable to pollution at these distances, either through being affected directly or indirectly, through pollution-related changes in characteristics of the habitats that they occupy. However, embedded mitigation implemented through the CoCP to avoid impacts, including the provision of an Onshore Pollution Prevention Plan that will contain details of emergency spill procedures, measures to control dust and particulates and a Bentonite Breakout Plan will ensure that impacts do not occur. Outlines of these plans are provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). The magnitude of any impacts is **negligible** which is not significant.

3.11.13.14 Any impacts from INNS on sand lizard would be largely associated with the changes in vegetation communities that invasive plant species cause, that could alter the conditions that sand lizard require. This would most probably involve the loss of areas with differing vegetation density for thermoregulation and areas of bare substrate for constructing burrows. The potential for introducing or changing the distribution of invasive plants in the majority of areas used by sand lizard is very limited.

3.11.13.15 The risk of spread of INNS and pathogens will be controlled by the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts would be **no change**.

Construction phase: Significance of the effect

3.11.13.16 The sensitivity of the receptor is **medium** and the magnitude of the impact is **negligible**. The effect will, therefore, be of **minor adverse** significance, which is not significant.

Operation and maintenance phase

3.11.13.17 Maintenance of the export cables will be undertaken only as required. Corrective activities will be limited and undertaken from the transition joint bays. No new trenching would be required. Therefore, the magnitude of impact is **no change** and there will be **no effect**.

Decommissioning phase

3.11.13.18 During decommissioning, cables will either be left *in situ* or removed from transition joint bays. This will not affect the distribution of INNS. The magnitude of impact will therefore be no greater than that occurring during construction (**negligible**). This would be **minor adverse**, which is not significant.

Summary of impacts on sand lizard

Table 3.47: Summary of impacts on sand lizard

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	Medium	Medium	Moderate adverse
Fragmentation, isolation and disturbance: operation and maintenance	No change	Medium	No effect
Fragmentation, isolation and disturbance: decommissioning	Negligible	Medium	Minor adverse
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)

Further (secondary) mitigation and residual effect

The impact of fragmentation, isolation and disturbance

3.11.13.19 Further mitigation is required to address the potential disturbance of sand lizard habitat caused by piling for the cofferdams that is necessary for the construction exit pits for the offshore export cables on North Beach. The following measures are proposed to reduce impacts to a level that is unlikely to have a significant effect, and are included in the Outline Ecological Management Plan (CoT76):

- vibration generating equipment to be situated as far from the sand lizard habitat as is practicable to reduce energy transfer to the sand dunes;
- the minimum hammer energy necessary to perform the task to be used;
- cut-off trenches to be installed between the source of vibration and the habitat. These act in the same way as a noise barrier and interrupt the direct path of vibrations to a receiver; and
- adoption of a minimum distance between the sand dune habitat that cofferdam installation can occur will aid in minimising impacts at the dunes.

3.11.13.20 The implementation of these measures are considered likely to reduce the magnitude of impacts to **low**, resulting in a **minor** effect, which is not significant.

Table 3.48: Impacts and effects on sand lizard with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: operation and maintenance	No change	Medium	No effect
Fragmentation, isolation and disturbance: decommissioning	Negligible	Medium	Minor adverse
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)

3.11.14 Otter

Sensitivity of receptor

3.11.14.1 Otter are recovering from historical declines in Lancashire but in accordance with BHS selection criteria, any site that regularly supports breeding otter is considered for selection. The population is therefore important at the county level and of **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.14.2 Surveys undertaken indicate that the home range of the breeding population of otter extends from Savick Brook, through Lea Marsh, across the River Ribble into Mill Brook and south to Penwortham (see Volume 3, Annex 3.12: Otter survey technical report of the ES). This area represents core habitat for the otter population. There is a concentration of field signs, including couches, spraints, feeding remains and prints immediately south of the A583 Blackpool Road that extends south to the 400 kV grid connection cable corridor. There are a number of field signs on both banks of the River Ribble close to the 400 kV grid connection cable corridor where it would cross beneath the River Ribble, as well as at the mouth of the Mill Brook. Field signs are also widely distributed along Mill Brook south to the A59 Liverpool Road.

3.11.14.3 Trenchless technologies would be used to install the 400 kV grid connection cables beneath Lea Marsh BHS and Savick Brook, which provides suitable habitat for otter. The trenchless construction would extend to approximately 80 m at the closest point from the boundary of the BHS, which is sufficient to avoid suitable habitat for otter .

3.11.14.4 Similarly, trenchless technologies would be used to cross beneath the River Ribble. There would be a maximum of four microtunnels or direct pipe bores over a distance of up to 650 m, which is sufficient to avoid riparian habitats.

3.11.14.5 Construction activities for the 400 kV grid connection cable corridor and National Grid connection compound at Penwortham would extend for approximately 700 m close to Mill Brook.

3.11.14.6 The use of trenchless technologies described above will avoid the habitat loss that would otherwise occur but there remains the potential for some loss, particularly and along parts of Mill Brook, and that other loss of habitat, outside of core areas, will also occur which would be an impact of **low** adverse magnitude.

3.11.14.7 Construction within the Onshore Infrastructure Area will involve activities in and close to aquatic habitats with potential to be used by otter. The loss and disturbance of these area has the potential for killing and injuring otter which would be of up to **medium** magnitude and adverse.

Construction phase: Significance of the effect

3.11.14.8 The magnitude of impact on otter, which are of **medium** sensitivity is up to **medium** and therefore the significance of the effect is **moderate and adverse**, which is significant.

Decommissioning phase

3.11.14.9 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. It is therefore unlikely that any additional otter habitat would be affected. As a worst case, the impact is assumed to be up to **low**. The effect will, therefore, be of up to **minor adverse** which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.14.10 The magnitude of impact of fragmentation and disturbance on otter will correspond to the impacts of habitat loss in the home range that extends from Savick Brook, through Lea Marsh, across the River Ribble into Mill Brook and south to Penwortham. Based on the extent and duration of works in core habitat, the magnitude of the impact would be **medium** and adverse**.**

3.11.14.11 Elsewhere, disturbance and fragmentation of otter habitat that may be used on a more sporadic basis will be long term but temporary and associated with the installation of the onshore export cables. A proportion of trenchless techniques crossings will limit impacts on commuting and foraging habitat. The magnitude of this impact is **low**.

Construction phase: Significance of the effect

3.11.14.12 The magnitude of impact on otter, which are of medium sensitivity is medium in the home range (associated with installation of the 400 kV grid connection

cables and National Grid connection compound) and therefore the significance of the effect is **moderate adverse**, which is significant. See **paragraph 3.11.14.22** for further (secondary) mitigation measures proposed to reduce the significance of effect.

3.11.14.13 Elsewhere (in areas affected by installation of the onshore export cables), the magnitude of impact would be low and the significance effect would be **minor adverse**, which is not significant.

Decommissioning phase

3.11.14.14 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. It is therefore unlikely that any additional otter habitat would be affected. As a worst case, the impact is assumed to be up to **low**. The effect will therefore be up to **minor adverse,** which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.14.15 Otter are vulnerable to pollution due to direct toxicity or changes in prey abundance. The installation of the 400 kV grid connection cables at Savick Brook, Lea Marsh and beneath the River Ribble will utilise trenchless techniques that will avoid habitat loss and limit disturbance but would involve the use of bentonite or other lubricants that can have toxic effects on aquatic habitats and species.

3.11.14.16 The implementation of the Bentonite Breakout Plan (CoT77) as part of the CoCP (CoT33) will control the risks associated with a bentonite breakout during trenchless cabling. An Outline Bentonite Breakout Plan is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies application for development consent.

3.11.14.17 Elsewhere, construction works in the core habitat for otters in areas affected by installation of the 400 kV grid connection cables and at the compounds for the crossing beneath the River Ribble will be above ground and could result in accidental breakout of contaminants but the implementation of the CoCP and its constituent Pollution Prevention Plan (CoT04) will avoid and reduce any such risks. An Outline Pollution Prevention Plan is provided as part of the Outline Code of Construction Practice (CoCP) that accompanies application for development consent (document reference J1). The magnitude of the impact on otter will therefore be **negligible**.

3.11.14.18 Otter are potentially vulnerable to habitat change and prey availability that could arise from increase in the extent or abundance of INNS in core habitat, although invasive plant species are already widespread within the habitat. Further spread of INNS could readily occur during the movement of machinery and materials.

3.11.14.19 The risk of spread of INNS and pathogens will be controlled by the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference

J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts would be **no change**.

Construction phase: Significance of the effect

3.11.14.20 The sensitivity of the receptor is **medium** and the magnitude of the impact associated with bentonite breakout and that with pollution at surface is **negligible**, and that of the spread of INNS will be **no change**. Overall, the effect will be **minor adverse**, which is not significant.

Decommissioning phase

3.11.14.21 During decommissioning, cables will either be left *in situ* or removed from link boxes. This will not affect the distribution of INNS. The magnitude of impact will therefore be no greater than that occurring during construction (**negligible**). This would be **minor adverse**, which is not significant.

Summary of impacts on otter

Table 3.49: Summary of impacts on otter

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss including potential killing and injury: construction	Up to medium	Medium	Up to moderate adverse
Temporary and permanent habitat loss: decommissioning	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: construction	Medium in home range, low elsewhere	Medium	Moderate adverse in home range, minor adverse elsewhere
Fragmentation, isolation and disturbance: decommissioning	Low	Medium	Minor adverse
Pollution caused by contaminant release and spread of INNS: construction	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)
Pollution caused by contaminant release and spread of INNS: decommissioning	Negligible	Medium	Minor adverse

Further (secondary) mitigation and residual effect

The impact of temporary and permanent habitat loss including potential killing and injury

3.11.14.22 The Outline Ecological Management Plan (document reference J6) also describes the precautionary measures to avoid killing and injury of otter where work is carried out in and close to habitats that they use. Where

necessary, any works that are considered to result in adverse effects on favourable conservation status will be carried out under a protected species mitigation licence.

The impact of fragmentation, isolation and disturbance

3.11.14.23 Isolation and disturbance impacts for otter are proposed to be addressed through the provision of habitat restoration in the home range within the Onshore Order Limits. This will be implemented prior to construction as part of the EMP (CoT76). The proposed mitigation measures involve amending grazing regimes and removal of invasive species in parts of Lea Marsh BHS, which is part of the habitat within the home range of the otter population in the area affected by the Transmission Assets. Habitat restoration in this area will increase its productivity for otter and compensate for loss and degradation of habitat arising during construction of the Transmission Assets. This will increase resilience and address disturbance and fragmentation, in combination with embedded measures in the CoCP.

Table 3.50: Impacts and effects on otter with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction and decommissioning	Negligible	Medium	Negligible
Fragmentation, isolation and disturbance: construction and decommissioning	Negligible	Medium	Negligible
Pollution caused by contaminant release, and spread of INNS: construction	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)
Pollution caused by contaminant release and spread of INNS: decommissioning	Negligible	Medium	Minor adverse

3.11.15 Fish assemblage in the River Ribble

Sensitivity of receptor

3.11.15.1 Infrequent records for protected and notable fish species were identified in the desk study. Those identified related to Atlantic salmon, brown/sea trout, European eel, river lamprey and smelt between 2004 and 2016. The fish assemblage of the River Ribble is of regional importance due to the presence of these species and its strategic importance for fish in north west England. Its sensitivity is **medium**.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.15.2 Trenchless technologies would be used to install cables beneath the River Ribble. There would be a maximum of four microtunnels or direct pipe bores over a distance of up to 650 m. The depth of the launch and receiver pits would be a maximum of 45 m. These techniques would avoid any impact on the river habitat and, therefore, there would be no impacts from temporary or permanent habitat loss on the fish assemblage in the River Ribble and the magnitude of impact is **no change**.

Construction phase: Significance of the effect

3.11.15.3 The magnitude of impact on the fish assemblage of the River Ribble is **no change**, sensitivity is **medium** and there is **no effect** which is not significant.

Decommissioning phase

3.11.15.4 During decommissioning, the 400 kV grid connection cables will either be left *in situ* or removed from link boxes. This will not result in habitat loss for the fish population and therefore the magnitude of impact is **no change** and there will be **no effect**.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.15.5 The population of salmon is declining, and vulnerable and short term disturbance may represent an additional pressure on the population. Trenchless technologies would be used to install cables beneath the River Ribble. There would be a maximum of four microtunnels or direct pipe bores over a distance of up to 650 m. The depth of the entry and exit pits would be a minimum of 6 m. Therefore, it is unlikely that noise and vibration associated with construction could have adverse effects on the passage of migratory fish. The impact is considered to be short term (up to 12 months for microtunnelling or direct pipe) and reversible and therefore of **low** magnitude.

Construction phase: Significance of the effect

3.11.15.6 The magnitude of impact on the fish assemblage of the River Ribble would be **low**. The sensitivity of the receptor is **medium** and therefore the effect would be **minor adverse**, which is not significant.

Decommissioning phase

3.11.15.7 During decommissioning, the 400 kV grid connection cables will either be left *in situ* or removed from link boxes. Therefore, the magnitude of impact is **no change** and there is **no effect** which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.15.8 Trenchless technologies would be used to install cables beneath the River Ribble. There would be a maximum of four microtunnels or direct pipe bores over a distance of up to 650 m. There will be no works within the channel of the River Ribble. However, there would be compounds for the installation of the cables beneath located either side of the river. There would also be compounds and temporary drainage for the Morgan and Morecambe onshore substations that are connected to the River Ribble by the Dow Brook, as well as various compounds for the installation of the onshore export cables and the 400 kV grid connection cables that may have indirect connectivity with the River Ribble. Bentonite, as well as other construction materials including concrete, fuels, solvents, other lubricants and foul drainage are hazardous to fish. They may be directly toxic or affect habitat and foraging resources. The Bentonite Breakout Plan (CoT77) will avoid and control any risks associated with pollution underground and the potential contamination of surface and ground water that may connect to the river. An Outline Bentonite Breakout Plan is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). As such, impacts are unlikely.

3.11.15.9 Measures to avoid dusts, runoff and release of contaminants will be implemented through the Outline Dust Management Plan (document reference J1.2) and Outline Pollution Prevention Plan (document reference J1.4). Outline plans are provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). These measures will control dust and control the risks associated with accidental spillage or runoff. As such, the magnitude of impacts from dust, runoff and contaminants from construction activity from surface works on fish would be **negligible.**

3.11.15.10 Invasive non-native plant species, such as Himalayan balsam, are widespread in the River Ribble and could be spread further by construction activities in or near watercourses that flow into the Ribble. Notable migratory fish species are unlikely to be directly affected but there could be indirect effects through changes in abundance of prey species. No works are proposed in the river channel. The risk of spread of INNS and pathogens will be controlled by the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts would be **no change**.

Construction phase: Significance of the effect

3.11.15.11 The magnitude of impact on the fish assemblage of the River Ribble associated with bentonite breakout and that with pollution at surface is **negligible**, and that of the spread of INNS will be **no change.** The sensitivity of the fish population is **medium** and the effect would be **negligible**, which is not significant.

Decommissioning phase

3.11.15.12 During decommissioning, the 400 kV grid connection cables will either be left *in situ* or removed from link boxes. As a worst case, the impact is assumed to be up to **negligible**. The effect will therefore be **minor adverse** which is not significant.

Summary of impacts on fish

Table 3.51: Summary of impacts on fish

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: decommissioning	No change	Medium	No effect
Pollution caused by contaminant release, and spread of INNS: construction and decommissioning	Negligible (bentonite and surface pollution) No change (INNS)	Medium	Minor adverse (bentonite and surface pollution) No effect (INNS)

Further (secondary) mitigation and residual effect

3.11.15.13 No significant effects have been identified and, therefore, no further (secondary) mitigation is required. As set out above, an Outline Ecological Management Plan (document reference J6) is submitted as part of the application for development consent, which includes an outline of the mitigation and management measures relevant to onshore ecology and nature conservation. Ecological Management Plan(s) (EMP) will be developed in accordance with the Outline Ecological Management Plan (document reference J6) in consultation with the relevant responsible authorities.

3.11.15.14 Residual effects would be as set out in **Table 3.51** above.

3.11.16 Aquatic invertebrates

Sensitivity of receptor

3.11.16.1 Five waterbodies of which two designated as BHS and three may qualify for designation are present in or adjacent to the Onshore Order Limits. They are at the following locations:

- one pond northeast of Woodside Farm, to the south of Moss Side, within the land required for the construction of the onshore export cable;
- one pond northeast of Freckleton, adjacent to the Onshore Order Limits where land is required for the construction of the Morecambe substation;

- three ponds east of Newton with Scales, in land permanently required for the Morgan Substation, these include Freshfield Pond North BHS and Freshfield Pond South BHS of which the former no longer support the feature for which it was designated but retains its status.

3.11.16.2 These ponds are county importance for their assemblages of aquatic invertebrates and are of **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.16.3 Four ponds, including both BHSs are wholly within the Onshore Order Limits. They will permanently be removed and based on the findings of surveys, sites with comparable assemblages of aquatic invertebrates are uncommon. the magnitude of impact from the loss of suitable habitat for the species present at these ponds is **high** adverse.

Construction phase: Significance of the effect

3.11.16.4 The magnitude of impact from the loss of assemblages of aquatic invertebrates of **medium** sensitivity is **high** and therefore the significance of the effect is **moderate adverse** in each case, which is significant. See **paragraph 3.11.16.13** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Decommissioning phase

3.11.16.5 As the ponds would be lost at the construction stage, there would be **no change** and **no effect** as the aquatic assemblages during decommissioning.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.16.6 A single pond is retained and is on the boundary of the Onshore Order Limits where land is required for the construction of the Morecambe onshore substation. It is unlikely, given the scale of construction and the abundance of ponds in the vicinity, that there will be any adverse effects from habitat fragmentation. It is possible that the pond could be subject to disturbance from nearby construction. Impacts will be minimised through measures implemented through the CoCP (CoT35). An Outline Code of Construction Practice (CoCP) (document reference J1) is provided as part of the application for development consent and includes measures to address effects on sensitive habitats. Therefore, magnitude of this impact is **low**.

Construction phase: Significance of the effect

3.11.16.7 The magnitude of impact on aquatic invertebrates, which are of medium sensitivity is low and the significance effect would be **minor adverse**, which is not significant.

Decommissioning phase

3.11.16.8 During decommissioning, cables will either be left *in situ* or removed from link boxes. No new trenching will be required. It is therefore unlikely that any additional otter habitat would be affected. As a worst case, the impact is assumed to be up to **low**. The effect will therefore be up to **minor adverse,** which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.16.9 Aquatic habitats and associated invertebrates are vulnerable to pollution due to direct toxicity or changes in habitat characteristics. The accidental breakout of contaminants but the implementation of the CoCP and its constituent Pollution Prevention Plan (CoT04) will avoid and reduce any such risks. An Outline Pollution Prevention Plan is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1) that accompanies application for development consent. The magnitude of the impact on aquatic invertebrates will therefore be **negligible**.

3.11.16.10 Aquatic invertebrates are potentially vulnerable to habitat change that could arise from increase in the extent or abundance of INNS. The risk of spread of INNS will be controlled by the Biosecurity Protocol. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts would be **no change**.

Construction phase: Significance of the effect

3.11.16.11 The sensitivity of the receptor is **medium** and the magnitude of the impact associated with bentonite breakout and that with pollution at surface is **negligible**, and that of the spread of INNS will be **no change**. Overall, the effect will be **minor adverse**, which is not significant.

Decommissioning phase

3.11.16.12 During decommissioning, cables will either be left *in situ* or removed from link boxes. This will not affect the distribution of INNS. The magnitude of impact will therefore be no greater than that occurring during construction (**negligible**). This would be **minor adverse**, which is not significant.

Summary of impacts on aquatic invertebrates

Table 3.52: Summary of impacts on aquatic invertebrates

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Permanent habitat loss: construction	High	Medium	Moderate adverse
Permanent habitat loss: decommissioning	NA	NA	NA
Fragmentation, isolation and disturbance: construction	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: decommissioning	Low	Medium	Minor adverse
Pollution caused by contaminant release and spread of INNS: construction	Negligible (surface pollution) No change (INNS)	Medium	Minor adverse (surface pollution) No effect (INNS)
Pollution caused by contaminant release and spread of INNS: decommissioning	Negligible	Medium	Minor adverse

Further (secondary) mitigation and residual effect

The impact of temporary and permanent habitat loss

3.11.16.13 The loss of notable species and diverse assemblages of aquatic invertebrates present at Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS and those at other locations will be addressed through the compensation for these sites involving the creation of new ponds south and west of Morgan onshore substation and 0.8 ha at moss side that will provide replacement habitat in the medium term, as described in **section 3.11.6**. Details will be provided in an EMP that will provide details on the long term monitoring, mitigation and management measures necessary to address the adverse effect on aquatic invertebrates.

3.11.16.14 Replacement ponds would be provided as part of the design of the onshore substations. Where practicable, material will be translocated from the affected ponds to the replacement ponds to maintain populations of notable aquatic invertebrates.

Table 3.53: Impacts and effects on aquatic invertebrates with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction and decommissioning	No change	Medium	No effect
Fragmentation, isolation and disturbance: construction	Low	Medium	Minor adverse
Fragmentation, isolation and disturbance: decommissioning	Low	Medium	Minor adverse
Pollution caused by contaminant release and spread of INNS: construction	Negligible (surface pollution) No change (INNS)	Medium	Minor adverse (surface pollution) No effect (INNS)
Pollution caused by contaminant release and spread of INNS: decommissioning	Negligible	Medium	Minor adverse

3.11.17 Terrestrial invertebrates and plants as part of SSSI and BHS designations

Sensitivity of receptors

3.11.17.1 Important coastal plant assemblages containing scarce and notable plant species are a reason for designation of Lytham St Annes Dunes SSSI and LNR, Lytham Foreshore Dunes and Saltmarsh BHS, St. Anne's Old Links Golf Course and Blackpool South Railway Line and the River Ribble, Lower Tidal Section BHS. The majority of plant records are from these sites and further records are present in the Ribble Estuary SSSI and the adjacent River Ribble, Lower Tidal Section BHS, and are a reason for designation of the BHS only.

3.11.17.2 Records for notable invertebrates are also concentrated in these coastal sites (supported by the plant communities) and particularly in Lytham St Annes Dunes SSSI, for which they are a reason for designation.

3.11.17.3 The assemblages of terrestrial invertebrates noted above form a reason for designation for various sites of importance for nature conservation that are of national and county importance in accordance with the applicable designations, that are described in **section 3.6.1**, and are respectively of **high** or **medium** sensitivity.

The impact of temporary and permanent habitat loss

Construction phase: Magnitude of impact

3.11.17.4 With the exception of a small area of the River Ribble, Lower Tidal Section BHS which is required for an operational access track, there would be no permanent or temporary loss of habitat at sites that contain notable plant species because trenchless techniques will be used to install the onshore

export cables and 400 kV grid connection cables (including the use of trenchless techniques beneath the River Ribble). At the dunes, direct pipe techniques would be used to pass beneath the Lytham St Annes Dunes SSSI and LNR and the exit pits would be located a minimum of 15 m from the designated sites.

3.11.17.5 The magnitude of impact is on assemblages of plants is **low** and terrestrial invertebrates is **no change**.

Construction phase: Significance of the effect

3.11.17.6 Terrestrial invertebrates and plants forming reasons for the SSSI and BHS designations are respectively of **high** and **medium** sensitivity according to the applicable designations. The magnitude of impacts on plants associated with BHS would be up to **low** and the significance of effect would therefore be **minor adverse**, which is not significant.

Decommissioning phase

3.11.17.7 Decommissioning is likely to operate within the parameters identified for construction. The cables would either be left *in situ* or removed from link boxes/transition joint bays. No excavation would be required in the dunes. There would be no loss of habitat coastal plants during decommissioning. The magnitude of impact would be **no change**, resulting in **no effect** which is not significant.

The impact of fragmentation, isolation and disturbance

Construction phase: Magnitude of impact

3.11.17.8 Important coastal plant assemblages containing scarce and notable plant species are a reason for designation of the Lytham St Annes Dunes SSSI, St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS and Lytham Foreshore Dunes and Saltmarsh BHS. The hydrogeological effects described for these sites in **section 3.11.4** and **section 3.11.5** which confirm the effect of dewatering during construction could affect St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS only. The magnitude of the separate impact associated with disruption of the aquifer from the presence of the six export cables beneath the dune habitats could be up to **high** in at all sites and would be a permanent impact that continues during operation and decommissioning.

3.11.17.9 The impacts from trampling, causing damage to habitats of which these assemblages are a part, and killing and injury, will be minimised or avoided through restriction of movement of personnel and machinery to within the Onshore Order Limits.

Construction phase: Significance of the effect

3.11.17.10 The magnitude of impact is up to **high** on features of **high** or **medium** sensitivity and the significance of effect is up to **major adverse** for the SSSI plant assemblage and **moderate adverse** for the BHS assemblage, which is

significant. See **paragraph 3.11.17.23** for further (secondary) mitigation measures proposed to reduce the significance of effect.

Operation and maintenance phase

3.11.17.11 As set out above, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue. This is assessed as a long term effect in the construction section above.

3.11.17.12 No new effects would arise during the operation and maintenance phase. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

Decommissioning phase

3.11.17.13 During decommissioning, cables would either be left *in situ* or removed from the transition joint bays. No new trenching would be required and no works within the SSSI and LNR are proposed.

3.11.17.14 In the event of continued presence of the cables, the presence of the cables beneath the dunes may result in effects on the hydrogeology and this would continue. This is assessed as a long term effect in the construction section above.

3.11.17.15 In the event that cables are removed, all decommissioning works would be undertaken in accordance with the Onshore Decommissioning Plan. Therefore, no new impacts relating to fragmentation, isolation and disturbance are predicted. The magnitude of impact would be **no change** and there would be **no effect**, which is not significant.

The impact of pollution caused by contaminant release and spread of INNS

Construction phase: Magnitude of impact

3.11.17.16 During construction, bentonite and other lubricants, as well as other construction materials such as concrete, fuels and solvents, will be present in close proximity to sites supporting notable plants and invertebrates. There will also be dust generating activities, such as the storage and movement of soils. These materials can affect sensitive plant species by causing direct toxicity, physical damage (smothering) and changing the nutrient and status of soils. Impacts on terrestrial invertebrates as a result of pollution would largely result from changes in plant communities, and also possibly as a result of direct toxic effects and smothering.

3.11.17.17 A Bentonite Breakout Plan (CoT77) is proposed in order to avoid and control any risks associated with pollution underground and the potential contamination of soils. An Outline Bentonite Breakout Plan (document reference J1.13) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1).

3.11.17.18 Measures to avoid dust, runoff and release of contaminants will be implemented through the Dust Management Plan and Pollution Prevention Plan (CoT04). Outline plans are provided as part of the Outline Code of

Construction Practice (CoCP) (document reference J1). As such, the magnitude of impacts from dust, runoff and contaminants from construction activity from surface works on notable plants and terrestrial invertebrates would be **negligible.**

3.11.17.19 Coastal plant communities and the notable plant species they contain are vulnerable to impacts from INNS including Japanese rose *Rosa rugosa* and non-native populations of sea buckthorn *Hippophae rhamnoides* that can out compete important coastal plant communities and change the conditions that they require to exist. The introduction of INNS to coastal plant communities is unlikely as the extent of construction within them is limited. However, there is a risk of introduction of INNS via traffic movements on nearby roads and works to watercourses that are linked to the Ribble Estuary. Any impacts on notable terrestrial invertebrates from the introduction of INNS would be largely associated with the changes in vegetation communities they cause. Invasive plants can change habitats and alter the conditions, such as light, heat and the presence of key forage species, that the notable invertebrate communities require. An Outline Biosecurity Protocol (document reference J1.12) is provided as part of the Outline Code of Construction Practice (CoCP) (document reference J1). With suitable control measures in place, the magnitude of impacts would be **no change**.

Construction phase: Significance of the effect

3.11.17.20 The magnitude of impact is pollution is **negligible** and that associated with the spread of INNS is **no change.** The significance of the effects on SSSI plant and invertebrate assemblage which is of **high** sensitivity is respectively **minor adverse** and **no effect.** The significance of effect on the BHS plant and invertebrate assemblage which is of **medium** sensitivity is respectively **negligible** and **no effect**.

Operation and maintenance phase

3.11.17.21 Maintenance of the cables will be undertaken only as required. Corrective activities will be limited and therefore the magnitude of impact is **no change** and there will be **no effect**.

Decommissioning phase

3.11.17.22 During decommissioning, cables will either be left *in situ* or removed from link boxes. This will not affect the distribution of INNS and therefore the magnitude of impact is **no change** and there will be **no effect**.

Summary of impacts on plants and terrestrial invertebrates

Table 3.54: Summary of impacts on plants and terrestrial invertebrates

Impact	Magnitude of impact	Sensitivity of receptor	Significance of effect
Temporary and permanent habitat loss: construction	Low	Medium (BHS)	Minor adverse
Temporary and permanent habitat loss: decommissioning	No change	Medium (BHS)	No effect
Fragmentation, isolation and disturbance: construction	High	High (SSSI) Medium (BHS)	Major adverse (SSSI) Moderate adverse (BHS)
Fragmentation, isolation and disturbance: operation and maintenance, decommissioning	No change	Medium (BHS)	No effect
Pollution caused by contaminant release, and spread of INNS: Construction	Negligible No change	High (SSSI) Medium (BHS)	Minor adverse, no effect (SSSI) Negligible, no effect (BHS)
Pollution caused by contaminant release, and spread of INNS: operation and maintenance and decommissioning	No change	High (SSSI) Medium (BHS)	No effect

Further (secondary) mitigation and residual effect

The impact of fragmentation, isolation and disturbance

3.11.17.23 Mitigation for the hydrogeological effects on sites designated for sand dunes and associated plants and invertebrates is described in **section 3.11.4** and **section 3.11.5**. It confirms that a site-specific crossing method statement will be agreed with the relevant authorities prior to construction, which will inform the installation depth of the cables and would reduce the magnitude of the impact to **low**. The effect of changes in hydrology on the SSSI and LNR will, therefore, be **minor adverse** which is not significant. [CoT76]

Table 3.55: Impacts and effects on plants and terrestrial invertebrates with secondary mitigation in place

Impact	Magnitude of impact	Sensitivity of receptor	Residual effect
Temporary and permanent habitat loss: construction	Low	Medium (BHS)	Minor adverse
Temporary and permanent habitat loss: decommissioning	No change	Medium (BHS)	No effect
Fragmentation, isolation and disturbance: construction	Low	High (SSSI) Medium (BHS)	Minor adverse
Fragmentation, isolation and disturbance: operation and maintenance, decommissioning	No change	Medium (BHS)	No effect
Pollution caused by contaminant release, and spread of INNS: Construction	Negligible No change	High (SSSI) Medium (BHS)	Minor, no effect Negligible, no effect
Pollution caused by contaminant release, and spread of INNS: operation and maintenance and decommissioning	No change	High (SSSI) Medium (BHS)	No effect

3.11.18 Future monitoring

3.11.18.1 A monitoring plan will be developed in conjunction with the Onshore Ecology EWG and will also take into account recommendations outlined in the Ecological Management Plan (CoT76).

3.11.18.2 CoT76 and CoT83 in **Table 3.20** set out the proposed monitoring commitments for onshore ecology and nature conservation, particularly those relevant to European protected species mitigation licence monitoring requirements. This includes monitoring to test the predictions of the impact assessment, if required, to ensure that mitigation and compensation areas are providing appropriate functionality to support protected and/or notable species and replacement habitats.

3.11.18.3 Further detail regarding future monitoring with respect to ecology and nature conservation is provided in the Outline Ecological Management Plan (document reference J6).

3.12 Cumulative effect assessment methodology

3.12.1 Introduction

3.12.1.1 The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Transmission Assets together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see Volume 1, Annex 5.5: Cumulative screening matrix and location plan of the ES. Each project has been considered on a case-by-case basis for screening

in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

3.12.1.2 The Onshore ecology and nature conservation CEA methodology has followed the methodology set out in Volume 1, Chapter 5: Environmental assessment methodology of the ES.

3.12.1.3 As part of the assessment, all projects and plans considered alongside the Transmission Assets have been allocated into 'tiers' reflecting their current stage within the planning and development process.

- Tier 1
  - Under construction.
  - Permitted application.
  - Submitted application.
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact.
- Tier 2
  - Scoping report has been submitted.
- Tier 3
  - Scoping report has not been submitted.
  - Identified in the relevant Development Plan.
  - Identified in other plans and programmes.

3.12.1.4 This tiered approach is adopted to provide a clear assessment of the Transmission Assets alongside other projects, plans and activities.

3.12.1.5 A total of 68 Tier 1 projects located within, or adjacent to, the Onshore Order Limits have been reviewed. No Tier 2 or Tier 3 projects were identified within or adjacent to the Onshore Order Limits. These projects were initially scoped in based on geographical proximity to the Onshore Order Limits (within 1 km). Some of these projects represent a potential constraint to be considered in terms of the construction of onshore Transmission Assets given their position within the Onshore Order Limits and will be considered as part of detailed design.

3.12.1.6 A further exercise was undertaken to scope projects in or out of further consideration. Of these 68 projects (discounting those where the application is refused or withdrawn), nine projects were scoped into the CEA for consideration for onshore ecology and nature conservation, based on their size, nature and/or position. These projects are outlined in **Table 3.56**.The remainder were scoped out on the basis of their:

- scale and whether they were of sufficient extent to contribute to cumulative effects;
- type and hence potential to increase the extent or magnitude of impacts of the Transmission Assets;

- timing and duration, predominantly in relation to the construction of the Transmission Assets; and
- location, in relation to IEFs.

3.12.1.7 No other projects are likely to have the potential to result in significant cumulative effects for this topic.

3.12.1.8 The CEA methodology outlined in Volume 1, Chapter 5: Environmental assessment methodology of the ES also considers CEA scenarios which consider the Transmission Assets together with the Generation Assets. These cumulative scenarios are: the Transmission Assets together with Morecambe Offshore Windfarm: Generation Assets only (scenario 1), Transmission Assets together with Morgan Offshore Wind Project: Generation Assets only (scenario 2) and Transmission Assets together with Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (scenario 3). However due to the lack of an impact pathway between onshore ecological receptors and the offshore infrastructure associated with the Generation Assets, there is no potential for cumulative effects and therefore these scenarios are not considered further.

Table 3.56: List of other projects, plans and activities considered within the CEA

Project/Plan	Status	Distance from the Transmission Assets	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets (Onshore Order Limits)
Land off Riversway and west of Dodney Drive, Lea, Preston Up to 280 dwellings, with associated infrastructure and open space 06/2022/1177	Permitted, not yet under construction	0.28 km	Application for up to 280 dwellings, with associated infrastructure and open space. 14.5 ha	Not provided	Not provided	Construction phase – Yes Operational phase – Yes
Land to the East of Peel Road Lawns Farm, Ballam Road, Westby with Plumptons Solar PV farm with associated infrastructure and access 21/0904	Under construction	0.37 km	Installation of solar panels and associated infrastructure, approximately 25MWp. 40 year operating life, with a further 6 months to allow for decommissioning and reinstatement. 75.4 ha	Not provided	Not provided	Construction phase – Yes Operational phase – Yes
Blackpool Airport Enterprise Zone, Land at Common Edge Road Formation of 12 new natural grass sports pitches 20/0114	Permitted and under construction	Within Onshore Order Limits	Part of the Blackpool Airport Enterprise zone. Application is for 12 grass sports pitches with a small portion designated as public open space. 11.5 ha	Under construction	Not provided	Construction phase – Yes Operational phase – Yes
197 Kirkham Rd, Freckleton, Preston	Permitted and under construction	0.04 km	Erection of twelve 2.5 storey dwellings, including 3 6-bed and 9 5-bed dwellings.	Under construction	Not provided	Construction phase – Yes

Project/Plan	Status	Distance from the Transmission Assets	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets (Onshore Order Limits)
Erection of twelve dwellings with associated access road, garages and parking spaces 10/0552			4.8 ha			Operational phase – Yes
Corner of Bryning lane and Hillock Lane, Bryning with Warton Up to 155 dwellings with open space and landscaping 19/0461	Pending	0.24 km	An outline planning application for a residential development of up to 155 dwellings with public open space, landscaping, SuDS and vehicular access point. 6.8 ha	Not provided	Not provided	Construction phase – Yes Operational phase – Yes
Land south of Queensway, Lytham St Annes Development of 882 dwellings, as a component of approved outline application for 1150 dwellings	Permitted and under construction	0.37 km	An outline planning application has been granted for 1150 new houses, provision for a school site and 34 ha of parkland. This was approved following a reopened public enquiry by the SoS in 2012. Following this, phase two development is for 882 dwellings with associated landscaping and infrastructure. Construction has begun but cannot continue until sufficient access has been provided. Temporary access is being sought under planning application reference 22/0188,	Under construction	Not provided	Construction phase – Yes Operational phase – Yes

Project/Plan	Status	Distance from the Transmission Assets	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets (Onshore Order Limits)
			until the proposed M55 link road has been constructed. 24.7 ha			
Phoenix Park, Wallend Road, Preston Dry ski slope, mountain bike track, creation of leisure lake and siting of up to 13no. lodges together with associated development 06/2023/0245	Permitted	0.02 km	Erection of dry ski slope and mountain bike track, creation of leisure lake and siting of up to 13 lodges to be occupied by young people together with associated development. 10.6 ha	Not provided	Not provided	Construction phase – Yes Operational phase – Yes
Clifton Marsh Farm, Preston New Road 49.9 MW solar farm 23/0739	Pending	0.12 km	Construction and operation of a 49.9 MW solar farm development and associated infrastructure 68.7 ha	Not provided	Not provided	Construction phase – Yes Operational phase – Yes
Land at Newton Grange Farm, Grange Lane Newton with Clifton 25 MW solar farm 22/0204	Pending	Adjacent to the Onshore Order Limits	Screening opinion sought for proposed 25 MW solar farm and associated infrastructure. Confirmed as non-EIA development by LPA.	Not provided	Not provided	Construction phase – Yes Operational phase – Yes

3.12.2 Scope of cumulative effects assessment

3.12.2.1 The impacts identified in **Table 3.57** have been selected as those having the potential to result in the greatest cumulative effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been based on the Project Design Envelope set out in Volume 1, Chapter 3: Project description of the ES as well as the information available on other projects and plans.

Table 3.57: Scope of assessment of cumulative effects

Cumulative effect	Phase[a]			Project(s) considered	Justification
	C	O	D		
Effects due to temporary and permanent habitat loss and the potential for killing/injury associated with construction and decommissioning activities, including open cut trenching and use of trenchless techniques (e.g., horizontal directional drilling (HDD)).	✓	x	✓	Maximum design scenario as described for the Transmission Assets (**Table 3.21)** assessed cumulatively with all nine Tier 1 projects within **Table 3.56.** **Tier 1** • Assumed that construction works to occur concurrently with the Transmission Assets. • The magnitude of operation and maintenance phase and decommissioning phase impacts will be smaller than construction phase impacts.	Outcome of the CEA will be greatest when the greatest number of other plans are considered. Only Tier 1 schemes within 1 km of the Onshore Infrastructure Area that involve building upon undisturbed land (greenfield) are considered have the potential to result in significant effects, those plans which involve demolition of existing buildings (brownfield) to create the footprint for new development are not considered to impact upon cumulative habitat loss.
Effects due to habitat fragmentation, species isolation and disturbance (e.g., light and noise pollution, changes to water quality/flow and emissions from dust) associated with construction and decommissioning activities including the open-cut trenching and the use of trenchless techniques (e.g., HDD).	✓	x	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. Only greenfield Tier 1 schemes within 1 km of the Onshore Infrastructure Area have been included, brownfield plans are not considered to impact upon cumulative habitat fragmentation and species isolation. All Tier 1 plans within 1 km of the Onshore Infrastructure Area are considered as disturbance travels beyond the source point and is dependent upon the IEFs involved.

Cumulative effect	Phase[a]			Project(s) considered	Justification
	C	O	D		
Effects due to pollution caused by accidental spills/contaminant release and the effects of introducing/spreading INNS associated with construction and decommissioning activities, including open cut trenching and the use of trenchless techniques (e.g., HDD).	✓	x	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. All Tier 1 plans within 1 km of the Onshore Infrastructure Area are considered as spills and/or contaminant release is possible on all projects. All Tier 1 plans within 1 km of the Onshore Infrastructure Area are considered as all plans (brownfield as well as greenfield) run the risk of spreading INNS.
Effects due to increases in emissions and deposition of nitrogen, oxides of nitrogen (NO_x), acidification and ammonia associated with increases in vehicle movements for construction	✓	x	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered.

[a]C=construction, O=operation and maintenance, D=decommissioning

3.13 Cumulative effects assessment

3.13.1 Introduction

3.13.1.1 A description of the significance of cumulative effects upon onshore ecological receptors arising from each identified impact is given below.

3.13.1.2 The CEA focuses on the development of greenfield sites, as there is a larger potential for a cumulative impact with the Transmission Assets on onshore ecology to occur in these cases.

3.13.1.3 It is important to note that mitigation for ecological impacts would be expected to be required (where appropriate) for the Tier 1 projects or plans as part of the permission process. This should include well-established and proven control measures, such as a CoCP or Construction and Environmental Management Plan, with Pollution Prevention Plan and INNS management measures included, to be produced prior to commencement of the projects. This would ensure that cumulative impacts associated with pollution and INNS are unlikely.

3.13.2 Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR

Magnitude of impacts

3.13.2.1 None of the projects screened into the CEA in **Table 3.56** have identified impacts on the interest features of the Ribble and Alt Estuaries Ramsar site or Ribble Estuary SSSI and NNR that are relevant to this assessment of onshore ecology and nature conservation. Therefore, the magnitude of impacts reported in **section 3.11.2 (no change)** would remain unaffected when considered alongside other proposed developments.

Significance of the effects

3.13.2.2 The significance of effects on the Ribble and Alt Estuaries Ramsar site and Ribble Estuary SSSI and NNR reported in **section 3.11.2** (no effect) would remain unaffected when considered alongside other proposed developments. No potential for significant cumulative effects has been identified (**no effect**).

3.13.3 Lytham St Annes Dunes SSSI and Lytham St Annes LNR

Magnitude of impacts

3.13.3.1 None of the projects screened into the CEA in **Table 3.56** have identified impacts on the interest features of Lytham St Annes Dunes SSSI and Lytham St Annes LNR. Therefore, the magnitude of impacts identified in **section 3.11.4** (**low**, taking into account secondary mitigation in relation to hydrogeology) would remain unaffected when considered alongside other proposed developments.

Significance of the effects

3.13.3.2 Overall, the significance of effects on of Lytham St Annes Dunes SSSI and Lytham St Annes LNR reported in **section 3.11.4 (minor adverse)** would remain unaffected when considered alongside other proposed developments. No potential for significant cumulative effects has been identified.

3.13.4 Biological Heritage Sites

Magnitude of impacts

3.13.4.1 The assessment of effects of the Transmission Assets on BHSs provided in **section 3.11.5** considered 12 BHSs, which are listed below. The magnitude of impacts from the Transmission Assets (accounting for any secondary mitigation) and the potential for cumulative effects with the projects screened into the cumulative assessment in **Table 3.56** is noted in each case.

- Lea Marsh BHS: The magnitude of impacts arising from the Transmission Assets resulting from the proposed operational access is **negligible**. None of the projects screened into the CEA in identified impacts on the BHS, which is referred to but scoped out in the assessment of effects carried out for the Clifton Marsh Farm solar development. Therefore, the magnitude of impact is unaffected when considered alongside other proposed developments.
- Lytham Foreshore Dunes and Saltmarsh BHS and St. Anne's Old Links Golf Course and Blackpool South Railway Line BHS: The magnitude of impact of the Transmission Assets arising from permanent changes in hydrogeology at these two sites is **low** (with secondary mitigation in place). None of the projects screened into the CEA have identified impacts on these BHSs. Therefore, the magnitude of impact is unaffected when considered alongside other proposed developments.
- Mason's Wood BHS: The magnitude of impacts of the Transmission Assets at this site is **no change**. None of the projects screened into the CEA in identified impacts on the BHS. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.
- The River Ribble, Lower Tidal Section BHS: The magnitude of impacts of the Transmission Assets from the proposed operational access is **negligible**. Approximately 7.61 ha of the proposed boundary (71.3% of the whole site area) of the proposed Pheonix Park lies within this BHS. The proposed planning condition of habitat creation and maintenance prior to construction will ensure that proposals for restoration of the BHS interest will be developed and implemented. Therefore, the magnitude of impacts set out for the Transmission Assets is unaffected when considered alongside other proposed developments.
- Savick Bridge BHS: The magnitude of impacts of the Transmission Assets from the proposed operational access and the risk of pollution during construction is **negligible**. None of the projects screened into the CEA have identified impacts on the BHS, which is referred to but scoped

out in the assessment of effects carried out for the Clifton Marsh Farm solar development. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.

- Howick Hall Ponds BHS: The magnitude of impacts of the Transmission Assets from habitat loss is **negligible**. None of the projects screened into the CEA have identified impacts on the BHS. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.
- Westby Claypit BHS: The magnitude of impacts of the Transmission Assets from habitat loss is **negligible**. The development of land south of Queensway is adjacent to this BHS, however, no projects screened into the CEA have identified impacts on the BHS. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.
- Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS: These will be permanently removed by construction of the Transmission Assets and mitigation is provided through creation of replacement ponds elsewhere permanently within Onshore Order Limits. The magnitude of impacts, with mitigation in place, is **low**. No projects screened into the CEA will result impacts to the mitigation provided by Transmission Assets. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.
- Mill Brook Valley BHS: The magnitude of impacts of effects of the Transmission Assets from habitat loss is **high**. No projects screened into the CEA have identified impacts on the BHS. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.
- Lytham Moss BHS: The commutive impacts on the reasons for designation of this BHS are considered in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

Significance of the effects

3.13.4.2 The projects screened into the cumulative assessment do not affect the significance of effects of the Transmission Assets reported in **section 3.11.5** at any of the BHS listed above (**moderate adverse** at one site, **minor adverse** at two and up to **negligible** elsewhere).

3.13.5 Ecological networks

Magnitude of impacts

3.13.5.1 The assessment of effects of the Transmission Assets on ecological networks is provided in **section 3.11.6**. The magnitude of impacts from the Transmission Assets would be **negligible** for the woodland ecological network and **low** for the grassland ecological network, with potential for an up to low magnitude beneficial impact in the long term arising from habitat

creation. Precautionarily however, this has been assessed to be no change in the long term.

3.13.5.2 The nine projects described in **Table 3.56** were scoped into the CEA for onshore ecology and nature conservation based on their size, nature and/or position. They are all extensive developments of greenfield sites that have a potential to result in cumulative impacts with the Transmission Assets on the IEFs that have been considered in **section 3.11.** Given the scale and location of projects screened into the CEA it is likely that they will affect ecological networks while they are being built. There is some potential for cumulative impacts where construction periods overlap with those for the Transmission Assets. However, like the Transmission Assets, which fully compensates for permanent habitat loss where possible (see the Onshore Biodiversity Benefit Statement, document reference J11), the projects considered in the CEA all provide mitigation for the loss of habitat that they incur. There are, for example, extensive areas of new habitat creation at land to the east of Peel Road that includes approximately 27 ha of species-rich grassland, a nature park at land south of Queensway (including ditches ponds, woodland, hedges, and wet grassland), and grassland creation and widening of the existing field margins at Clifton Marsh Solar Development. As stated in the documents for Newton Grange Farm, habitat creation is provided in places that are of strategic significance for habitat connectivity.

3.13.5.3 It is not considered that any of the projects in the CEA would have long term impacts that would adversely affect ecological networks. The magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments (up to **low**).

Significance of the effects

3.13.5.4 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on ecological networks (up to **minor adverse**).

3.13.6 Ancient woodland and veteran trees

3.13.6.1 None of the projects screened into the CEA report effects on ancient woodland or veteran trees. The projects screened into the cumulative assessment do not affect the magnitude of impact or significance of effects of the Transmission Assets for ancient woodland and veteran trees reported in section **3.11.8** and section **3.11.9**, which is **negligible** in both cases (resulting in effects up to **minor adverse**). No potential for significant cumulative effects has been identified.

3.13.7 Priority habitats

Magnitude of impacts

3.13.7.1 The assessment of effects of the Transmission Assets on priority habitats is provided in **section 3.11.10** . The magnitude of impacts would be low for coastal and floodplain grazing marsh, ponds and hedgerows and no change for other habitats that present in the Onshore Order Limits.

3.13.7.2 As described in relation to ecological networks, the developments considered in the CEA provide new habitat to mitigate for the losses they cause, which predominantly affects coastal and floodplain grazing marsh, woodland, ponds and hedgerow priority habitats. These projects also demonstrate where losses of priority habitats have been minimised through retaining them where possible in scheme design. Therefore, habitat retention and replacement mean that the extent of loss and fragmentation is limited overall.

3.13.7.3 It is not considered that any of the projects in the CEA would have long term impacts that would adversely affect priority habitats. The magnitude of impacts of the Transmission Assets (up to **high**) would be unaffected when considered alongside other proposed developments.

Significance of the effects

3.13.7.4 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on priority habitats (up to **moderate adverse**).

3.13.8 Bats

Magnitude of impacts

3.13.8.1 The assessment of effects of the Transmission Assets on bats is provided in **section 3.11.11**, which identifies impacts of **low** magnitude on a population of Daubenton's bats and an assemblage of bats affected by the permanent loss of habitat associated with the Morgan onshore substation. The impact of temporary habit loss and habitat fragmentation throughout the Onshore Oder Limits is also **low**.

3.13.8.2 No confirmed roosts have been recorded at projects included in the CEA. Trees suitable for roosting bats have or will be removed at land south of Queensway and land off Riversway, but replacement roosting sites will be provided. At other developments, potential roost sites have limited potential or will be retained. Foraging habitat is of limited quality or will be retained, as will linear commuting features. Projects including corner of Bryning lane, land off Riversway and land south of Queensway will create or enhance foraging and commuting habitat. It is considered that the mitigation and compensation for bats provided by projects included in the CEA is sufficient to avoid cumulative impacts with the Transmission Assets and that the magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments.

Significance of the effects

3.13.8.3 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on bats (up to **minor adverse**).

3.13.9 Great crested newt

Magnitude of impacts

3.13.9.1 The assessment of effects of the Transmission Assets on GCN is provided in **section 3.11.12,** which identifies impacts on indicative metapopulations on which impacts are addressed through contribution to the DLL scheme and the magnitude of impacts is consequently **no change**. There is incomplete information on GCN in relation to other projects considered in the CEA but the quality of breeding habitat is frequently poor and GCN are considered likely to be absent in the vicinity of several projects including at land south of Queensway. Breeding and important foraging habitat is frequently retained and protected in the CEA projects. GCN are considered to be present in Clifton Marsh solar development and will be mitigated through contribution to the DLL scheme. Mitigation would be required at any further locations where GCN were present as part of compliance with legislation. Consequently, the magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments (up to **negligible**).

Significance of the effects

3.13.9.2 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on GCN. (up to **minor adverse**)

3.13.10 Sand lizard

Magnitude of impacts

3.13.10.1 The assessment of effects of the Transmission Assets on reptiles is provided in **section 3.11.13** which identifies a **minor** adverse impact from disturbance during construction on a population of sand lizards at the Fylde sand dunes. None of the projects considered in the CEA are sufficiently close to the coast to affect sand lizard. None of the projects provide records for reptiles from project-specific baseline surveys and reptiles are considered to be absent or potentially present in suitable habitats that will be retained. The magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments (up to **low**).

Significance of the effects

3.13.10.2 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on reptiles (up to **minor adverse**).

3.13.11 Otter

Magnitude of impacts

3.13.11.1 The assessment of effects of the Transmission Assets on otter is provided in **section 3.11.14**, which identifies **negligible** impacts from habitat loss and

disturbance during construction where activities are proposed close to Savick Brook, the River Ribble and Mill Brook. Impacts on otter are not widely discussed in the projects included in the CEA, with the exception of Phoenix Park that notes their presence offsite at Savick Brook and the River Ribble and recommends maintaining habitat connectivity and avoiding the creation of hazards during the construction phase. The project at 197 Kirkham Road and the Clifton Marsh solar development have potential for disturbance and habitat fragmentation and would avoid adverse impacts through appropriate construction management. The development of land off Riversway is adjacent to Savick Brook so could result in cumulative impacts with the Transmission Assets in the absence of appropriate construction management which it is assumed will be provided. This project includes a large area of new natural habitat along the Savick Brook that is likely to benefit otter. The magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments, given the mitigation provided by these projects.

Significance of the effects

3.13.11.2 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on otter (up to **minor adverse**).

3.13.12 Fish assemblage in the River Ribble

Magnitude of impacts

3.13.12.1 The assessment of effects of the Transmission Assets on the fish assemblage in the River Ribble is provided in **section 3.11.15,** which identifies **minor** impacts from habitat disturbance during construction. The documents for Phoenix Park contain a reference to controlling the disturbance of piling, if used, which would reduce any impacts that construction of this project would have on the fish assemblage. The magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments given the mitigation provided by this project (**up to low**).

Significance of the effects

3.13.12.2 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on fish (up to **minor adverse**).

3.13.13 Aquatic invertebrates as part of BHS designation

Magnitude of impacts

3.13.13.1 The assessment of effects of the Transmission Assets on aquatic invertebrates is provided in **section 3.11.16.** They are a reason for the designation of Freshfield Farm Pond, North BHS and Freshfield Farm Pond, South BHS. Both would be permanently removed by the construction of the

Transmission Assets and mitigation is provided through creation of replacement ponds elsewhere permanently within Onshore Order Limits.

3.13.13.2 The magnitude of impacts with mitigation in place is **no change**. No projects screened into the CEA will result in impacts to the mitigation provided by the Transmission Assets. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments.

3.13.13.3 Moss bladder snail *Aplexa hypnorum* is among the species referred to in the citations for these BHSs. It has also been recorded in surveys for land south of Queensway at Lytham Moss BHS (for which invertebrates do not form a reason for designation). It may also occur in other wetland BHS within the Onshore Order Limits but the impact on these sites from the Transition Assets is **negligible** and it is unlikely that cumulative impacts would occur.

3.13.13.4 The magnitude of impacts of the Transmission Assets is unaffected when considered alongside other proposed developments given the mitigation provided by this project (**up to low**).

Significance of the effects

3.13.13.5 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on aquatic invertebrates (up to **minor adverse**).

3.13.14 Terrestrial invertebrates and plants as part of SSSI and BHS designations

Magnitude of impacts

3.13.14.1 The assessment of effects of the Transmission Assets on terrestrial invertebrates is provided in **section 3.11.17.** They are a reason for the designation of several designated sites, particularly those associated with the Fylde sand dunes and Ribble Estuary. Impacts on invertebrates from the presence of an operational access track in the River Ribble, Lower Tidal Section BHS are considered to be **no change** in magnitude. The construction of Phoenix Park is partly within the BHS and will result in the loss of habitat supporting notable invertebrates but will be mitigated by habitat creation and management. Therefore, it is not necessary to reevaluate the impact of the Transmission Assets on invertebrates at this site. As noted in **section 3.11.5** any construction effects at Westby Claypit BHS would be negligible and consequently there will be no cumulative impacts on the invertebrate interest of this with the development of land south of Queensway, which is nearby. Therefore, the magnitude of impacts is unaffected when considered alongside other proposed developments (up to **low**).

Significance of the effects

3.13.14.2 The projects screened into the cumulative assessment do not affect the level of significance of effects of the Transmission Assets on terrestrial invertebrates (up to **minor adverse**).

3.13.15 Future monitoring

3.13.15.1 No monitoring beyond that set out in **section 3.11.18** is considered necessary to test the predictions made within the impact assessment and no residual significant cumulative effects beyond those identified for the Transmission Assets alone are anticipated.

3.14 Transboundary effects

3.14.1.1 A screening of transboundary impacts has been carried out (see Volume 1, Annex 5.4: Transboundary screening of the ES) and has identified that there are no likely significant transboundary impacts on the onshore ecology and nature conservation of another state.

3.14.1.2 Any impacts on onshore ecology and nature conservation arising from the construction, operation and maintenance and decommissioning of the Transmission Assets will be confined to a localised area around the footprint of the onshore elements of the Transmission Assets and/or its immediate surrounding area. These impacts would occur within the Onshore Order Limits. There is no pathway by which direct or indirect impacts arising from the Transmission Assets could result in significant effects on the onshore ecology and nature conservation of another state.

3.15 Inter-related effects

3.15.1.1 Inter-relationships are the impacts and associated effects of different aspects of the Transmission Assets on the same receptor. These are as follows.

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Transmission Assets (construction, operation and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor group than if just one phase were assessed in isolation.
- Receptor led effects: Assessment of the scope for all relevant effects across multiple topics to interact, spatially and temporally, to create inter-related effects on a receptor.

3.15.1.2 This chapter assesses the significance of effects on onshore ecology. This includes consideration of the potential for loss of habitat, disturbance and pollution caused by accidental spills/contamination, and effects on ecological networks and receptors of spreading INNS, based on the findings of the following chapters.

- Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES.
- Volume 3, Chapter 2: Hydrology and flood risk of the ES.
- Volume 3, Chapter 3: Onshore ecology and nature conservation of the ES.
- Volume 3, Chapter 6: Land use and recreation of the ES.
- Volume 3, Chapter 8: Noise and vibration of the ES.

- Volume 3, Chapter 9: Air quality of the ES.

3.15.1.3 Effects associated with groundwater and contamination are assessed within Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the ES. Effects associated with drainage and water quality are assessed within Volume 3, Chapter 2: Hydrology and flood risk of the ES. Effects on agricultural land use are assessed in Volume 3, Chapter 6: Land use and recreation of the ES. The generation of construction dust is assessed in Volume 3, Chapter 9: Air quality of the ES and of noise emissions in Volume 3, Chapter 8: Noise and vibration of the ES.

3.15.1.4 Further details of inter-related effects are provided in Volume 4, Chapter 3: Inter-relationships of the ES.

3.16 Summary of impacts, mitigation measures and monitoring

3.16.1.1 Information on onshore ecology and nature conservation was collected through a desk study and detailed analysis of data gathered during site-specific surveys and consultation with relevant stakeholders.

3.16.1.2 **Table 3.58** presents a summary of the impacts, measures adopted as part of the Transmission Assets and residual effects in respect to onshore ecology. The impacts assessed include the following.

- Effects due to temporary and permanent habitat loss and the potential for killing/injury associated with construction and decommissioning activities, including open cut trenching and use of trenchless techniques.
- Effects due to habitat fragmentation, species isolation and disturbance (e.g., light and noise pollution, changes to water availability) associated with construction and decommissioning activities including the open cut trenching and trenchless technique.
- Effects due to pollution caused by accidental spills/contaminant release or impact of spreading INNS that may be associated with construction and decommissioning activities, including open cut trenching and trenchless techniques.
- Effects due to changes in air quality (including dust) and deposition of pollutants associated with increases in vehicle movements for construction.

3.16.1.3 Overall, it is concluded that there is the potential for significant effects from temporary or permanent habitat loss for three BHSs, bats, GCN, otter and aquatic invertebrates. Potentially significant effects from habitat fragmentation and isolation have been identified for two BHSs, bats (in relation to a maternity roost), GCN, otter (within home range only) and terrestrial invertebrates.

3.16.1.4 In addition, potentially significant effects have been identified associated with potential hydrogeological changes on the Lytham St Annes Dunes SSSI and Lytham St Annes LNR and the sand lizards in this location.

3.16.1.5 Mitigation measures are proposed to address the potential significant effects. With these measures in place, only one significant effect remains – that relating to the partial loss of Mill Brook Valley BHS.

3.16.1.6 In addition, it is noted that a number of areas have been identified as having potential for biodiversity benefit, including provision of new habitat and opportunities for enhancement of habitats including waterbodies, hedgerows, and grassland, which in turn will contribute to the Lancashire ecological networks, as well as working with the DLL scheme for GCN. This will result in the potential for some long term beneficial effects, but precautionarily this has been assessed to be no change.

3.16.1.7 **Table 3.59** presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impacts assessed include the following.

- Effects due to temporary and permanent habitat loss and the potential for killing/injury associated with construction and decommissioning activities, including open cut trenching and use of trenchless techniques.
- Effects due to habitat fragmentation, species isolation and disturbance (e.g., light and noise pollution, changes to water availability) associated with construction and decommissioning activities including the open cut trenching and trenchless technique.

3.16.1.8 With well-established and proven control measures in place, such as a CoCP or Construction and Environmental Management Plan, with Pollution Prevention Plan and INNS management measures, cumulative impacts associated with pollution and INNS are unlikely.

3.16.1.9 None of the other projects identified for consideration in the CEA are likely to result in cumulative effects when considered with the Transmission Assets. The significance of effects for each IEF therefore remains as reported for the Transmission Assets alone.

3.16.1.10 No potential transboundary impacts have been identified in regard to the Transmission Assets.

Table 3.58: Summary of environmental effects, mitigation and monitoring

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR	✓	×	✓	CoT04, CoT27, CoT33, CoT44, CoT73, CoT90.	Habitat loss C: No change D: No change Fragmentation, isolation and disturbance C: No change D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible	Very high (Ramsar site) High (SSSI, NNR)	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	CoT76.	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	No proposed monitoring unless identified as a requirement through further species surveys and will be set out in the Ecological Management Plan which will be secured as part of the DCO application.
Lytham St Annes Dunes SSSI and Lytham St Annes LNR	✓	✓	✓	CoT04, CoT27, CoT33, CoT44, CoT41. CoT73.	Habitat loss C: No change D: No change	High (SSSI) Medium (LNR)	Habitat loss C: No effect D: No effect	CoT41, CoT76, CotT28.	Habitat loss C: No effect D: No effect	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					Fragmentation, isolation and disturbance C: No change (temporary dewatering), up to high (presence of cables). O: No change D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible		Fragmentation, isolation and disturbance C: No effect (temporary dewatering), up to major adverse (presence of cables). O: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse		Fragmentation, isolation and disturbance C: No effect (temporary dewatering), minor adverse (presence of cables). O: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	
Red Scar and Tun Brook Woods SSSI	✓	×	✓	CoT04, CoT33, CoT73	The impact of pollution caused by contaminant release, and spread of INNS	High	The impact of pollution caused by contaminant release, and spread of INNS	N/A	The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (surface	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					C: Negligible (surface pollution); No change (INNS) D: Negligible The impact of changes in air quality from emissions and deposition: C: Low D: Negligible		C: Minor adverse (surface pollution), No effect (INNS) D: Minor adverse The impact of changes in air quality from emissions and deposition: C: Minor adverse D: Minor adverse		pollution), No effect (INNS) D: Minor adverse The impact of changes in air quality from emissions and deposition: C: Minor adverse D: Minor adverse	
Biological Heritage Sites and Local Nature Reserves	✓	✓	✓	CoT02, CoT04, CoT08, CoT18, CoT27, CoT31, CoT33, CoT44, CoT73, CoT90.	Habitat loss C: No change (one BHS), negligible (five BHS), high (three BHS). No change (LNR) D: No change Fragmentation, isolation and disturbance C: No change (one BHS), negligible (six BHS), high	Medium	Habitat loss C: No effect (one BHS), negligible (seven BHS), moderate adverse (three BHS). No change (LNR) D: No effect Fragmentation, isolation and disturbance C: No effect (one BHS), negligible (six BHS), moderate adverse	CoT41, CoT76.	Habitat loss C: Moderate adverse at one BHS, minor adverse at two BHS, negligible at seven sites, no effect at one BHS. No effect (LNR) Creation of new ponds would have potential for beneficial effects but is assessed here as no effect. O: No effect	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D		(two BHS). No change (LNR) O: No change D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (bentonite breakout and surface pollution), No change (INNS) D: Negligible The impact of changes in air quality from emissions and deposition C: Negligible (15 BHS, 3 LNR), N/A (11 BHS, 1 LNR) D: Negligible		(two BHS). No effect (LNR) O: No effect. D: No effect. The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (bentonite breakout and surface pollution), No effect (INNS) D: Minor adverse The impact of changes in air quality from emissions and deposition C: Negligible (15 BHS, 3 LNR), N/A (11 BHS, 1 LNR) D: Negligible		D: No effect Fragmentation, isolation and disturbance C: No effect (one BHS), negligible (six BHS), minor adverse (two BHS). No effect (LNR). O: No effect. D: No effect. The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (bentonite breakout and surface pollution), No effect (INNS) D: Minor adverse The impact of changes in air quality from	

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
									emissions and deposition C: Negligible	
Ecological networks	✓	×	✓	CoT02, CoT04, CoT06, CoT08, CoT13, CoT14, CoT27, CoT33, CoT44, CoT73, CoT90.	Temporary and permanent habitat loss: C: Up to low D: Up to low Fragmentation, isolation and disturbance: C: Negligible D: Negligible	Medium	Temporary and permanent habitat loss: C: Up to minor adverse D: Up to minor adverse Fragmentation, isolation and disturbance: C: Minor adverse D: Minor adverse	CoT76	Temporary and permanent habitat loss: C: Minor adverse D: Minor adverse Permanent habitat creation: C: No effect (permanent) Fragmentation, isolation and disturbance: C: Minor adverse D: Minor adverse	None
Ancient woodland	✓	×	✓	CoT03, CoT33.	Pollution caused by contaminant release, and spread of INNS: C: Negligible (contaminant release), No change (INNS)	High	Pollution caused by contaminant release, and spread of INNS: C: Minor adverse (contaminant release) No effect (INNS) D: No effect	CoT76.	Pollution caused by contaminant release, and spread of INNS: C: Minor adverse (bentonite and surface pollution) No effect (INNS) D: No effect	

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					D: No change The impact of changes in air quality from changes in emissions and deposition C: Negligible D: Negligible		The impact of changes in air quality from changes in emissions and deposition C: Minor adverse D: Minor adverse		The impact of changes in air quality from changes in emissions and deposition C: Minor adverse D: Minor adverse	
Veteran trees	✓	×	✓	CoT03, CoT33.	Habitat loss C: No change D: No change Fragmentation, isolation and disturbance C: No change D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible D: No change	Medium	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Negligible D: No effect	CoT76.	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Negligible D: No effect	

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Priority habitats	✓	×	✓	CoT03, CoT04, CoT06, CoT08, CoT13, CoT14, CoT18, CoT27, CoT33, CoT44, CoT73, CoT90.	Habitat loss C: Up to high D: No change Fragmentation, isolation and disturbance C: Low D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible	High/Medium	Habitat loss C: Up to moderate adverse D: No effect Fragmentation, isolation and disturbance C: Minor adverse D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	CoT28, CoT76.	Habitat loss C: Up to moderate adverse D: No effect Fragmentation, isolation and disturbance C: Minor adverse D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (bentonite breakout and surface pollution), No effect (INNS) D: Minor adverse	
Bats	✓	✓	✓	CoT02, CoT12, CoT13, CoT18, CoT27, CoT33, CoT90.	Habitat loss C: Medium D: No change	Medium	Habitat loss C: Moderate adverse D: No effect	CoT28, CoT76.	Habitat loss C: Minor adverse D: No effect	

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					Fragmentation, isolation and disturbance C: Medium (Daubenton's roost, noctule roost and bat assemblage south of Kirkham), low (wider population) O: Up to medium (lighting) D: Up to low		Fragmentation, isolation and disturbance C: Moderate adverse (Daubenton's roost, noctule roost and bat assemblage south of Kirkham), minor adverse (wider population) O: Up to moderate adverse (lighting) D: Up to minor adverse		Fragmentation, isolation and disturbance C: Minor adverse O: Minor adverse D: Minor adverse	
GCN	✓	×	✓	CoT04, CoT08, CoT27, CoT31, CoT37.CoT73	Habitat loss C: Up to high D: No change Fragmentation, isolation and disturbance C: High D: No change The impact of pollution caused by contaminant	Medium	Habitat loss C: Up to moderate adverse D: No effect Fragmentation, isolation and disturbance C: Moderate adverse D: No effect The impact of pollution caused	CoT76, CoT92.	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: No effect D: No effect The impact of pollution caused by contaminant	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible		by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse		release, and spread of INNS C: Minor adverse (bentonite and surface pollution), No effect (INNS) D: Minor adverse	
Sand lizard	✓	✓	✓	CoT04, CoT27, CoT33, CoT44, CoT73.	Habitat loss C: No change D: No change Fragmentation, isolation and disturbance C: Medium O: No change D: Negligible The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant	Medium	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: Moderate adverse O: No effect D: Negligible The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS)	CoT41, CoT76.	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: Minor adverse O: No effect D: Negligible The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					release), No change (INNS) D: Negligible		D: Minor adverse			
Otter	✓	×	✓	CoT02, CoT04, CoT08, CoT14, CoT27, CoT33, CoT73, CoT90.	Habitat loss C: Up to medium D: Low Fragmentation, isolation and disturbance C: Medium in home range, low elsewhere D: Low The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible	Medium	Habitat loss C: Up to moderate adverse D: Minor adverse Fragmentation, isolation and disturbance C: Moderate adverse in home range, minor adverse elsewhere D: Minor adverse The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	CoT76	Habitat loss C: Negligible D: Negligible Fragmentation, isolation and disturbance C: Negligible D: Negligible The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (bentonite and surface pollution) No effect (INNS) D: Minor adverse	CoT83.

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Fish assemblage in River Ribble	✓	×	✓	CoT02, CoT04, CoT08, CoT14, CoT27, CoT33, CoT73, CoT90.	Habitat loss C: No change D: No change Fragmentation, isolation and disturbance C: Low D: No change The impact of pollution caused by contaminant release, and spread of INNS C: Negligible (contaminant release), No change (INNS) D: Negligible	Medium	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: Minor adverse D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	CoT76.	Habitat loss C: No effect D: No effect Fragmentation, isolation and disturbance C: Minor adverse D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (contaminant release), No effect (INNS) D: Minor adverse	None
Aquatic invertebrates	✓	×	✓	CoT03, CoT04, CoT31, CoT33. CoT73	Habitat loss C: High D: No change	Medium	Habitat loss C: Moderate adverse D: No effect Fragmentation, isolation and disturbance	CoT76	Habitat loss C: No effect D: No effect	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					Fragmentation, isolation and disturbance C: Low D: Low The impact of pollution caused by contaminant release, and spread of INNS C: Negligble (surface pollution), No change (INNS) D: Negligible		C: Minor adverse D: Minor adverse The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (surface pollution), No effect (INNS) D: Minor adverse		Fragmentation, isolation and disturbance C: Minor adverse D: Minor adverse The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse (surface pollution), No effect (INNS) D: Minor adverse	
Terrestrial invertebrates and plants	✓	✓	✓	CoT02, CoT04, CoT08, CoT13, CoT14, CoT27, CoT33, CoT73	Habitat loss C: up to low D: No change Fragmentation, isolation and disturbance C: High O: No change D: No change	Medium (BHS) High (SSSI)	Habitat loss C: Up to minor adverse D: No effect Fragmentation, isolation and disturbance C: Major adverse (SSSI), Moderate adverse (BHS)	CoT28, CoT76.	Habitat loss C: Minor adverse D: No effect Fragmentation, isolation and disturbance C: Minor adverse O: No effect D: No effect	None

Description of impact	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					The impact of pollution caused by contaminant release, and spread of INNS C: Negligible, no change D: No change		O: No effect D: No effect The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse, no effect (SSSI), Negligible, no effect (BHS) D: No effect		The impact of pollution caused by contaminant release, and spread of INNS C: Minor adverse, no effect D: No effect	

[a] C=construction, O=operation and maintenance, D=decommissioning

Table 3.59: Summary of cumulative environmental effects, mitigation and monitoring

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Tier 1										
Ribble and Alt Estuaries Ramsar site, Ribble Estuary SSSI and NNR	✓	×	✓	As per **Table 3.58** above.	C: No change D: No change	Up to very high.	C: No effect D: No effect		C: No change D: No effect	None
Lytham St Annes Dunes SSSI and Lytham St Annes LNR	✓	×	✓	As per **Table 3.58** above.	C: Low D: Low	Up to high	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	None
Biological Heritage Sites and Local Nature Reserves	✓	×	✓	As per **Table 3.58** above.	C: Up to high D: Up to low	Medium	C: Up to moderate adverse D: Up to minor adverse		C: Up to moderate adverse D: Up to minor adverse	None
Ecological networks	✓	×	✓	As per **Table 3.58** above.	C: Up to low D: Up to low	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	None
Ancient woodland and veteran trees	✓	×	✓	As per **Table 3.58** above.	C: Negligible D: Negligible	Up to high	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	None

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Priority habitats	✓	×	✓	As per **Table 3.58** above.	C: Up to high D: Up to low	Up to high	C: Up to moderate adverse D: Up to minor adverse		C: Up to moderate adverse D: Up to minor adverse	
Bats	✓	×	✓	As per **Table 3.58** above.	C: Low D: Low	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	
GCN	✓	×	✓	As per **Table 3.58** above.	C: Negligible D: Negligible	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	
Sand lizard	✓	×	✓	As per **Table 3.58** above.	C: Low D: Negligible	Medium	C: Minor adverse D: Negligible		C: Minor adverse D: Negligible	
Otter	✓	×	✓	As per **Table 3.58** above.	C: Negligible D: Negligible	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Negligible	
Fish assemblage in River Ribble	✓	×	✓	As per **Table 3.58** above.	C: Low D: Low	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	
Aquatic invertebrates	✓	×	✓	As per **Table 3.58** above.	C: Low D: Low	Medium	C: Minor adverse D: Minor adverse		C: Minor adverse D: Minor adverse	

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Terrestrial invertebrates and plants	✓	×	✓	As per **Table 3.58** above.	C: Low D: No change	Up to high	C: Minor adverse D: No effect		C: Minor adverse D: No effect	

C=construction, O=operation and maintenance, D=decommissioning

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