The Great Grid Upgrade

Sea Link

Preliminary Environmental Information Report

Volume: 1

Part 2 Suffolk Onshore Scheme

Chapter 3 Ecology and Biodiversity

Version A

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2.3 Ecology and Biodiversity

2.3.1 Introduction

2.3.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents information about the preliminary environmental assessment of the likely significant effects on ecology and biodiversity identified to date, that could result from Sea Link (hereafter referred to as the Proposed Project) (as described in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**).

2.3.1.2 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, mitigation measures and the preliminary ecology and biodiversity residual significant effects that could result from the Proposed Project.

2.3.1.3 The draft Order Limits, which illustrate the boundary of the Proposed Project, are illustrated on **Figure 1.1.1 Draft Order Limits** and the proposed Suffolk Onshore Scheme is illustrated on **Figure 1.1.2 Suffolk Onshore Scheme**.

2.3.1.4 This chapter should be read in conjunction with:

- **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**;
- **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**;
- **Volume 1, Part 1, Chapter 6, Scoping Opinion and EIA Consultation**;
- **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme**; and
- **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report.**

2.3.1.5 This chapter is supported by the following figures:

- **Volume 3, Part 2, Figure 2.3.1 Designated Sites;**
- **Volume 3, Part 2, Figure 2.3.2 Phase 1 Habitat Survey;** and
- **Volume 3, Part 2, Figures 2.3.3 Survey Parcels – Suffolk.**

2.3.1.6 This chapter is supported by the following appendices:

- **Volume 1, Part 1, Appendix 1.4.A, Outline Code of Construction Practice**;
- **Volume 1, Part 1, Appendix 1.4.F, Schedule of Environmental Commitment and Mitigation Measures;** and
- **Volume 1, Part 2, Appendix 2.3.A, Phase 1 Habitat Report.**

2.3.2 Regulatory and Planning Context

2.3.2.1 This section sets out the legislation and planning policy that is relevant to the preliminary ecology and biodiversity assessment. A full review of compliance with relevant national and local planning policy will be provided within the Planning Statement that will be submitted as part of the application for Development Consent.

2.3.2.2 Policy generally seeks to minimise ecology and biodiversity effects from development and to avoid significant adverse effects. This applies particularly to land designated for their ecological importance but which lack direct protection through statute (such as local wildlife sites), as well as to rare and notable species of animal and plant. Policy also sets out positive enhancement requirements regarding Biodiversity Net Gain (BNG).

Legislation

2.3.2.3 There are numerous pieces of legislation applicable to England & Wales which provide protection to certain species, or ecologically important sites. Although the UK is no longer part of the European Union, legislation originally devised to reflect EU Directives (notably the Habitats and Birds Directives) remain part of UK law.

The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref. 2.3.36)

2.3.2.4 The Conservation of Habitats and Species Regulations 2017 (as amended) transposed the requirements of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive') into domestic legislation.

2.3.2.5 The Regulations identify European Protected Species (EPS) and various habitats of importance within Europe, with important sites for these habitats/species or both being designated as Special Areas of Conservation (SAC) and important sites for birds being designated as Special Protection Areas (SPAs). Any Proposed Project that may have a significant effect on a SAC or SPA should be assessed in relation to the site's 'conservation objectives' (i.e., the reasons for which the site is designated).

2.3.2.6 The Regulations also implement the species protection regime set out within the Habitats Directive, providing a clear legal basis for surveillance and monitoring of European Protected Species.

The Natural Environment and Rural Communities Act 2006 (Ref. 2.3.37)

2.3.2.7 Section 41 of the Natural Environment and Rural Communities Act 2006 ('the NERC Act') requires the listing of habitats and species that are of principal importance for the conservation of biodiversity, including those that have been identified as priorities within the UK Biodiversity Action Plan (UK BAP).

2.3.2.8 The NERC Act requires that the Section 41 list be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 'to have due regard' to the conservation of biodiversity when carrying out their normal functions.

Wildlife and Countryside Act 1981 (as amended) (Ref. 2.3.35)

2.3.2.9 The Wildlife and Countryside Act 1981 (as amended) ('the WCA') is the major domestic legal instrument for wildlife protection in the UK and is the primary means by which the following are implemented:

- The Convention on the Conservation of European Wildlife and Natural Habitats ('the Bern Convention'); and
- The Council Directive 79/409/EEC on the Conservation of Wild Birds ('the Bird Directive').

2.3.2.10 The main relevant provisions of the WCA are the allowance for the protection of the most important habitats and species by designating Sites of Special Scientific Interest (SSSIs), providing a level of protection to all nesting wild birds (with protection from disturbance to some bird species), and providing similar protection to some other species (such as water voles (*Arvicola amphibius*) and beavers (*Castor fiber*)). It also lists some invasive non-native species that should not be allowed to spread.

The Countryside and Rights of Way Act 2000 (Ref. 2.3.38)

2.3.2.11 Part III of the Countryside and Rights of Way Act 2000 ('the CRoW Act') deals specifically with wildlife protection and nature conservation in England and Wales. The CroW Act strengthened the safeguards afforded to Sites of Special Scientific Interest (SSSIs) and adds to the protection of wild animals designated under the WCA 1981 by making it an offence to "recklessly disturb" the sheltering places of wild animals designated under Schedule 5 of the WCA.

Environment Act 2021 (Ref. 2.3.39)

2.3.2.12 The Environment Act 2021, includes proposals to make biodiversity net gain (BNG) a mandatory requirement within the planning system in England. The biodiversity elements of the Act include:

- strengthened biodiversity duty;
- biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- duty upon Local Authorities to consult on street tree felling;
- strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;
- prohibit larger UK businesses from using commodities associated with wide-scale deforestation; and
- requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain.

Animal Welfare Act 2006 (Ref. 2.3.40)

2.3.2.13 This Act sets out the ways in which animals should be treated, considered and cared for throughout Britain. It applies primarily to domestic animals but some broad provisions, such as the potential for the government to introduce codes of conduct, could apply to wild animals.

Protection of Badgers Act 1992 (Ref. 2.3.41)

2.3.2.14 This Act protects Badgers (*Meles meles*) and their setts. In England and Wales this makes it an offence to:

- wilfully kill, injure or take a badger (or attempt to do so);

- cruelly ill-treat a badger;
- dig for a badger, intentionally or recklessly damage or destroy a badger sett, or obstruct access to it; cause a dog to enter a badger sett; and
- disturb a badger while it is occupying a sett.

Wild Mammals (Protection) Act 1996 (Ref. 2.3.42)

2.3.2.15 This Act makes it an offence to intentionally cause all wild mammals unnecessary suffering by certain methods (e.g. crushing, suffocation).

The Hedgerow Regulations 1997 (Ref. 2.3.33)

2.3.2.16 These regulations prevent the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. This is not required if the removal is part of a planning application (as in this case). However, the Regulations still have value in these circumstances because the prescribed survey methods result in detailed contextual information to inform ecological impact assessment.

2.3.2.17 The regulations specify the criteria to be used to determine which hedgerows are important. The criteria relate to the value of the hedgerows from an archaeological, historical, landscape or ecological perspective. Hedgerows that are younger than 30 years old are excluded if supportive evidence of age can be provided, as are any hedgerows that mark the boundary of a house.

2.3.2.18 In addition, the regulations only apply to hedgerows that are of a certain length. These are:

- Hedgerows that are 20 metres or more long; or
- Hedgerows that are less than 20 metres long, if they are connected at each end to another hedgerow – thereby forming a continuous network of hedgerows. The length of the adjoining hedgerows is immaterial, the significant factor being the connection; and
- Any stretch within one of these hedgerows.
- Any hedgerows that are over 30 years old and qualify under any one of the criteria would be termed ‘important’.

Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (Ref. 2.3.43)

2.3.2.19 These regulations set out to address the problems concerned with invasive alien species (IASs) in order to protect native biodiversity and ecosystem services and minimize and mitigate the human health and/or economic impacts that IASs can have. It sets out rules to prevent and manage the introduction and spread of IASs through prevention, early detection and rapid eradication, and management.

National Policy

National Policy Statements

2.3.2.20 National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. A review of the NPS was announced in the 2020 Energy white paper: Powering our net zero future. This review was to ensure the NPSs were brought up to date to reflect the policies set out in the white paper. The below information reflects these updates currently under consultation. Table 2.3.1 and Table 2.3.2 below provides details of the elements of NPS for Energy (EN-1) (Ref. 2.3.48) and NPS for Electricity Networks Infrastructure (EN-5) (Ref. 2.3.49) that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the Environmental Statement (ES).

2.3.2.21 The draft version of the updated Overarching National Policy Statement for Energy (EN-1) and NPS for Electricity Networks Infrastructure (EN-5) were published in March 2023 (Ref. 2.3.6 and Ref. 2.3.7) and also include factors that should be considered when submitting an application and preparing an ecology and biodiversity assessment. Table 2.3.1 and Table 2.3.2 provide a comparison between the adopted and draft versions.

Table 2.3.1: NPS EN-1 requirements relevant to ecology and biodiversity

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
	4.5.4 Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, or the wider environment where possible.	Mitigation measures to ensure the conservation of ecological receptors will be reported in Section 2.3.9 of this chapter. Where the Environmental Impact Assessment (EIA) process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent and will be included within a biodiversity net gain assessment.
5.3.3 Where the development is subject to EIA the applicant should ensure that the	*5. 4.17 Same as 5.3.3 in adopted EN-1*	Designations, habitats and species of principal importance, and protected species

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
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. *5.5.9 The applicant should be particularly careful to identify any effects of physical changes on the integrity and special features of Marine Conservation Zones, candidate marine Special Areas of Conservation (SACs), coastal SACs and candidate coastal SACs, coastal Special Protection Areas (SPAs) and potential coastal SPAs, Ramsar sites, Sites of Community Importance (SCIs) and potential SCIs and Sites of Special Scientific Interest.*		have been identified within Section 2.3.8 of this chapter, as far as they have been determined at this stage, given some surveys are ongoing or have not yet been commenced at the time of writing (see Table 2.3.6). The likely effects on these features have been assessed as far as possible and are reported in Section 2.3.10 of this chapter.
Paragraph 5.3.4 same text as 2023 draft NPS EN-1	*5.4.19 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.*	Mitigation measures to ensure the conservation of ecological receptors will be reported in Section 2.3.9 of this

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
		chapter. Where the Environmental Impact Assessment (EIA) process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent and will be included within a biodiversity net gain assessment.
5.3.4 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.	*5.4.19 same text as EN-1*	Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent.
	5.4.21 As set out in Section 4.6, 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 4.5 on Environmental and Biodiversity Net Gain). The scope of potential gains will be dependent on the type, scale, and location of each project.	Opportunities for nature inclusive design will be taken in design of the Proposed Project and reported in the ES.
	5.4.22 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.	Impacts on mobile species (such as otter (*Lutra lutra*) and water vole (*Arvicola amphibius*), bats and birds) have been identified within Section 2.3.8 of this

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
		chapter, as far as they have been determined at this stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced at the time of writing (see Table 2.3.6). The likely effects on these features have been assessed as far as possible and are reported as part of Section 2.3.10 of this chapter.
4.3.1 Prior to granting a development consent order, the IPC must, under the Habitats and Species Regulations, (which implement the relevant parts of the Habitats Directive and the Birds Directive in England and Wales) consider whether the project may have a significant effect on a European 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. Further information on the requirements of the Habitats and Species Regulations can be found in a Government Circular. Applicants should also refer to Section 5.3 of this NPS on biodiversity and geological	*5.4.25 The applicant should seek the advice of the appropriate Statutory Nature Conservation Body (SNCB) and provide the Secretary of State with such information as the Secretary of State may reasonably require, to determine whether an Appropriate Assessment (AA) is required. Applicants can request and agree 'Evidence Plans' with SNCBs, which is a way to agree and record upfront the information the applicant needs to supply with its application, so that the HRA can be efficiently carried out. If an AA is required, the applicant must provide the Secretary of State with such information as may reasonably be required to enable the Secretary of State to conduct the AA. This should include information on any mitigation measures that are proposed to minimise or avoid likely significant effects.*	The relevant SNCB (Natural England) are involved in regular meetings over this Proposed Project with the project team, and a Habitats Regulations Screening Assessment (HRA) is appended to the PEIR (see **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report**).

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
conservation. The applicant should seek the advice of Natural England and/or the Countryside Council for Wales, and provide the IPC with such information as it may reasonably require to determine whether an Appropriate Assessment is required. In the event that an Appropriate Assessment is required, the applicant must provide the IPC with such information as may reasonably be required to enable it to conduct the Appropriate Assessment. This should include information on any mitigation measures that are proposed to minimise or avoid likely effects.		
5.3.14 The IPC should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including need) of the development, in that location outweigh the loss of the woodland habitat. Aged or 'veteran' trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be	*5.4.32 Applicants should include measures to mitigate the direct and indirect effects of development on ancient woodland, veteran trees or other irreplaceable habitats during both construction or decommissioning and operational phase.*	Impacts on ancient woodland, veteran trees and other irreplaceable habitats have been identified within Section 2.3.8 of this chapter, as far as they have been determined at this stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced at the time of writing (see Table 2.3.6). The likely effects on these features have been assessed as far as possible and are

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why.		reported as part of Section 2.3.10 of this chapter. For the application for development consent there will also be a specific arboriculture impact assessment.
5.3.15 Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, the IPC should maximise such opportunities in and around developments, using requirements or planning obligations where appropriate.	*5.4.33 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 4.5.*	**Volume 1, Part 5, Chapter 1, Introduction** of the PEIR discusses climate change. Where the EIA process identifies opportunities to build in biodiversity features as part of good design, these will be reported in the Planning Statement submitted with the application for development consent and will be related where possible to wider initiatives such as Local Nature Recovery Strategies.
5.3.17 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,	*5.4.34 same text as EN-1*	Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent and will be related where possible to wider initiatives such as Local Nature Recovery Strategies.

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
and national goals and targets set through the government's strategy for nature for example.		
5.3.18 The applicant should include appropriate mitigation 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;* *● 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; and* *● opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals*	*5.4.35 Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the Proposed Project. In particular, the applicant should demonstrate that:* *• during construction or decommissioning, they will seek to ensure that activities will be confined to the minimum areas required for the works* *• the timing of construction or decommissioning has been planned to avoid or limit disturbance* *• during construction or decommissioning 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 or decommissioning works have finished* *• opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping proposals. Where habitat creation is required as mitigation, compensation, or enhancement the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised*	Mitigation measures to ensure the conservation of ecological receptors during and after construction are reported in Section 2.3.9 of this chapter to the extent they have been identified at this stage. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent.

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
	5.4.36 Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction or decommissioning and operation stages.	A Biodiversity Management Strategy will be produced to accompany the application for development consent once the impact assessment process is complete at the ES Stage.
5.3.11 Where a proposed development on land within or outside an SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect, after mitigation, on the site's notified special interest features is likely, an exception should only be made where the benefits (including need) of the development at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs.		The likely effects on SSSIs have been assessed as far as possible and are reported in Section 2.3.9 of this chapter.
5.11.7 The applicant should consult EA and Natural England (NE), or the Countryside Council for Wales (CCW), as necessary and in particular with		Consideration of disturbance including from noise is covered in Section 2.3.9 of this chapter as far as they have been determined at this

NPS EN-1 section (2011 NPS)	NPS EN-1 section (2023 Draft NPS)	Where this is covered in the PEIR
regard to assessment of noise on protected species or other wildlife. The results of any noise surveys and predictions may inform the ecological assessment. The seasonality of potentially affected species in nearby sites may also need to be taken into account.		stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced at the time of writing (see Table 2.3.6). Natural England will be consulted on this chapter through the PEIR consultation process and have been involved in ongoing discussions over the Proposed Project. Once surveys are complete, National Grid Electricity Transmission plc (National Grid) will aim to agree parameters for noise assessment of birds in particular with Natural England.

Table 2.3.2: NPS EN-5 requirements relevant to ecology and biodiversity

NPS EN-5 section (2011 NPS)	NPS EN-5 section (2023 Draft NPS)	Where this is covered in the PEIR
2.7.1 …large birds such as swans and geese may collide with overhead lines associated with power infrastructure, particularly in poor visibility. Large birds in particular may also be electrocuted when landing or taking off by completing an electric circuit between live and ground wires. Even perching birds can be killed as soon as their wings touch energised parts.	*2.9.5 and 2.9.6 …Large birds may also be electrocuted when landing or taking off by completing an electric circuit between live and ground wires. Even perching birds can be killed as soon as their wings touch energised parts of the infrastructure…The Applicant will need to consider whether the proposed line will cause such problems at any point along its length and take this into*	There will be no new overhead powerline for the proposed Suffolk Onshore Scheme. Therefore, collision risk has not been considered in the PEIR.

NPS EN-5 section (2011 NPS)	NPS EN-5 section (2023 Draft NPS)	Where this is covered in the PEIR
2.7.2 The applicant will need to consider whether the proposed line will cause such problems at any point along its length and take this into consideration in the preparation of the Environmental Impact Assessment (EIA) and ES (see Section 4.2 of EN-1). Particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds.	*consideration in the preparation of the ES (see Section 4.2 of EN-1). Particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds, where they are functionally linked to sites designated or allocated under the 'national site network' provisions of the Conservation of Habitats and Species Regulations.*	
2.7.4 to 2.7.6 Careful siting of a line away from, or parallel to, but not across, known flight paths can reduce the numbers of birds colliding with overhead lines considerably.	*2.10.2 similar text to adopted EN-5*	There will be no new overhead powerline for the proposed Suffolk Onshore Scheme. Therefore, collision risk has not been considered in the PEIR.
2.7.4 to 2.7.6 Making lines more visible by methods such as the fitting of bird flappers and diverters to the earth wire, which swivel in the wind, glow in the dark and use fluorescent colours designed specifically for bird vision can also reduce the number of deaths. The design and colour of the diverters will be specific to the conditions – the line and pylon/transmission tower specifications and the species at risk.	*2.10.3 similar text to adopted EN-5*	There will be no new overhead powerline for the proposed Suffolk Onshore Scheme. Therefore, collision risk has not been considered in the PEIR.
2.7.4 to 2.7.6 Electrocution risks can be reduced through the design of crossarms, insulators and the	*2.10.4. similar text to adopted EN-5*	There will be no new overhead powerline for the proposed Suffolk Onshore Scheme. Therefore, collision risk

NPS EN-5 section (2011 NPS)	NPS EN-5 section (2023 Draft NPS)	Where this is covered in the PEIR
construction or decommissioning of other parts of high voltage power lines so that birds find no opportunity to perch near energised power lines on which they might electrocute themselves		has not been considered in the PEIR.

National Planning Policy Framework

2.3.2.22 The National Planning Policy Framework (NPPF) (Ref. 2.3.18) will be an important consideration and relevant to the Secretary of State's (SoS') consideration of the Proposed Project. Table 2.3.3 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the ES.

Table 2.3.3: NPPF requirements relevant to ecology and biodiversity

NPPF section	Where this is covered in the PEIR
Paragraph 174 "Planning policies and decisions should contribute to and enhance the natural and local environment by [inter alia] … protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); … [and] recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services; … [and] minimising impacts on and providing net gains for biodiversity; …[and] preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability".	Designations, habitats and species of principal importance (sites of biodiversity value), and protected species have been identified within Section 2.3.8 of this chapter, as far as they have been determined at this stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced at the time of witing. The likely effects on these features have been assessed as far as possible and are reported as part of Section 2.3.10. Mitigation measures to ensure the conservation of ecological receptors are reported in Section 2.3.9 of this chapter to the extent they have been identified at this stage. Where the EIA process identifies

NPPF section	Where this is covered in the PEIR
	opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent and in a biodiversity net gain assessment.
Paragraph 179 "To protect and enhance biodiversity and geodiversity, plans should: Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; [and] promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."	This paragraph is mainly concerning plans such as Local Plans. However, identification of designations, habitats and species of principal importance (local wildlife rich habitats), and protected species is contained within Section 2.3.8 of this chapter, as far as they have been determined at this stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced at the time of writing (see Table 2.3.6). The likely effects on these features have been assessed as far as possible and are reported in Section 2.3.10 of this chapter. Mitigation measures to ensure the conservation of ecological receptors are reported in Section 2.3.9 to the extent they have been identified at this stage. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent and in a biodiversity net gain assessment.
Paragraph 180 "When determining planning applications, local planning authorities should apply	The mitigation hierarchy defined in paragraph 180 has

NPPF section	Where this is covered in the PEIR
the following principles: If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; 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; 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 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.	been used and will be used during further Proposed Project design development, and construction or decommissioning methods for the Proposed Project in Suffolk.
Paragraph 181 "The following should be given the same protection as habitats sites: Potential Special Protection Areas and possible Special Areas of Conservation; Listed or proposed Ramsar sites ; and 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.	The Information to Inform HRA that constitutes **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report** of the PEIR considers all potential SAC and SPA designations, as well as Ramsar sites.

National planning practice guidance

2.3.2.23 Most planning practice guidance for biodiversity is associated with strategic planning rather than planning applications. Guidance available on planning applications covers biodiversity net gain[1], protection of trees and woodlands[2] and the appropriate assessment process[3] . The guidance is high-level and not prescriptive.

Local Planning Policy

2.3.2.24 The proposed Suffolk Onshore Scheme lies within the jurisdiction of Suffolk County Council. The Suffolk Onshore Scheme Boundary (refer to **Figure 1.1.2 Suffolk Onshore Scheme**) lies within the jurisdiction of East Suffolk Council. Local planning policy for East Suffolk Council consists of two parts; the Suffolk Coastal Local Plan (Ref. 2.3.9) and the Waveney Local Plan (Ref. 2.3.28) (which cover the former Suffolk Coastal and Waveney Districts).

2.3.2.25 Local planning policy which is relevant to a study of ecology and biodiversity and has informed the assessment of preliminary effects in this chapter are as follows:

- Suffolk Coastal Local Plan (Adopted September 2020) (Ref. 2.3.9)

2.3.2.26 This is because Waveney Local Plan covers an area much further north that does not overlap with the draft Order Limits of the Proposed Development. The proposed Suffolk Onshore Scheme lies within the boundary of the East Suffolk Coastal Local Plan (adopted September 2020). Local Plan policies which are relevant to ecology and biodiversity matters and will inform the ES are detailed in Table 2.3.4.

Table 2.3.4: Local Planning Policies relevant to ecology and biodiversity

Suffolk Coastal Local Plan – Policy	Where this is covered in the PEIR
Policy SCLP10.1: Biodiversity and Geodiversity – This policy sets out a requirement for all development to achieve a net gain for biodiversity, identifies that development which would harm a local wildlife site will not be supported unless the benefits of the project outweigh the harm caused, identifies the need for surveys if protected or Suffolk priority species are present, identifies the need for Habitats Regulations Assessment where SACs and SPAs are involved, and sets out the mitigation hierarchy of avoid-mitigate-compensate.	Designations, habitats and species of principal importance, and protected species have been identified within Section 2.3.8 of this chapter, as far as they have been determined at this stage of the Proposed Project, given some surveys are ongoing or have not yet been commenced. The likely effects on these features have been assessed as far as possible in Section 2.3.10 of this chapter. Mitigation measures to ensure the conservation of ecological receptors are reported in Section 2.3.9 to the extent they have been identified at this stage. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the

[1] https://www.gov.uk/government/collections/biodiversity-net-gain

[2] https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas

[3] https://www.gov.uk/guidance/appropriate-assessment

Suffolk Coastal Local Plan – Policy	Where this is covered in the PEIR
	application for development consent and in a biodiversity net gain assessment. The mitigation hierarchy defined in paragraph 180 of the NPPF has been used and will be used during further scheme design, in determining the routing and construction or decommissioning methods for the proposed Suffolk Onshore Scheme. The Information to Inform Habitats Regulations Assessment that constitutes **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report** of the PEIR considers all potential SAC and SPA designations, as well as Ramsar sites.
Policy SCLP10.3: Environmental Quality – Policy requires development proposals to minimise all forms of pollution. Specific pathways relevant to ecological receptors are air quality, water quality and noise and light pollution.	Section 2.3.10 of this chapter considers pollution impacts as far as possible at this stage of scheme development.

2.3.2.27 Additional planning guidance documents relevant to ecology and biodiversity matters are as follows:

- Suffolk Biodiversity Action Plan (Ref. 2.3.24) - comprises a list of priority species and habitats in the county, which are material considerations in the planning process. Relevant habitats for the Proposed Project in Suffolk include common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), adder (*Vipera berus*), all of which are found in RSPB North Warren Reserve), great crested newt, dormouse, coastal saltmarsh & intertidal mudflats, arable field margins, acid grassland, hedgerows, lowland mixed deciduous woodland, lowland acid grassland and rivers and streams.
- Suffolk Nature Strategy (Ref. 2.3.25) – the Strategy advocates that new energy infrastructure should be sensitive to place and that relevant policies as well as national and local guidance, appropriate biological data and Suffolk's Landscape Character Assessment should be used to assess suitability of new energy infrastructures, and other developments, to particular places. It also advocates the achievement of biodiversity net gain for development, in line with national guidance.

2.3.4 Scoping Opinion and Consultation

Scoping

2.3.4.1 A Scoping Report (Ref. 2.3.30) for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 and a Scoping Opinion (Ref. 2.3.31) was received from the Secretary of State (SoS) on 1 December 2022. Table 2.3.5 sets out the comments raised in the Scoping Opinion and how these have been addressed in this PEIR or will be addressed within the ES. The Scoping Opinion takes account of responses from prescribed consultees as appropriate.

Table 2.3.5: Comments raised in the Scoping Opinion

ID	Inspectorate's comments	Response
3.2.1	This matter [impacts on terrestrial invertebrates] is scoped out on the basis that it is unlikely that notable population assemblages will be significantly affected by direct mortality once mitigation measures are in place, as such populations will be linked to habitat. The Scoping Report notes the possible presence of notable invertebrate assemblages within designated sites potentially affected by the Proposed Project, including Leiston-Aldeburgh Site of Special Scientific Interest (SSSI). Furthermore, the Scoping Report states that the likely presence of notable invertebrate assemblages will be determined through the Phase 1 Habitat Surveys to be undertaken. Natural England in its response at Appendix 2 to this Opinion also identify that further SSSIs and the Sandlings Special Protection Area (SPA) support invertebrate assemblages and may require further invertebrate surveys. In the absence of baseline information on notable invertebrate assemblages, the Inspectorate is not in a position to agree to scope this matter from the assessment. The ES should include an assessment of this matters, or the information referred to demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect.	The potential for the site to support notable invertebrates is discussed within Section 2.3.8 of this chapter, as far as it has been determined at this stage of the Proposed Project, given surveys are ongoing at the time of writing (see Table 2.3.6). The likely effects on these features have been assessed as far as possible and are reported in Section 2.3.10 of this chapter and will be discussed further in the ES for the DCO. Leiston-Aldeburgh SSSI will be traversed using a trenchless technique rather than open cut trenching, which will avoid impacts on the invertebrate populations of that particular SSSI.

ID	Inspectorate's comments	Response
3.2.2	The location and extent of Sandlings SPA is not clear from Figure 2.3.1. Figures accompanying ES should clearly show and label the location and extent of designated sites.	**Figure 2.3.1 Designated Sites** has been included in this chapter and shows the location of this SPA within the context of the Suffolk Onshore Scheme.
3.2.3	The description of the Outer Thames Estuary SPA does not reference the little tern and common tern qualifying features. The ES should include reference to all relevant ecological receptors.	Section 2.3.8 of this chapter references the Outer Thames Estuary SPA includes little tern and common tern features.
3.2.4	The ES should clearly define and justify the study area, based on the Zone of Influence (ZOI) from the Proposed Project and the potential effect pathways to designated sites, particularly the use of the 10km zone and in light of comments received by Natural England in this regard.	Each impact pathway discussed in this chapter has a specific referenced zone of influence.
3.2.5	The Scoping Report does not at this stage provide an indication of the likely spatial extent of the potential suite of bird surveys. The ES should confirm the extent of bird surveys undertaken, supported by clear figures. The ES should also consider whether any areas of functionally linked land would be affected by the Proposed Project.	The bird surveys being undertaken for the Proposed Project have covered the November 2022 to March 2023 survey season and the March 2023 to June 2023 survey season. Surveys will be repeated in September 2023 to March 2024 and March to June 2024 to ensure two full seasons of coverage. The surveys are covering all suitable habitat within the draft Order Limits for the Suffolk Onshore Scheme and will therefore enable areas of functionally-linked habitat to be identified. Once the surveys are complete, figures will be submitted as part of the ES to be submitted with the application for development consent which will clearly show the areas of survey coverage.
3.2.6	Surveys are proposed for riparian mammals (otter and water vole); however, impacts to fish and other freshwater species have not been considered in the Biodiversity aspect chapter of the Scoping Report. The ES should state whether fish and other freshwater species are present as important ecological receptors and include an assessment of effects on	Surveys for fish and other water column aquatic ecology receptors are yet to commence, as the determination of which waterbodies to survey partly depends on how those features are to be traversed. Survey results for fish and other freshwater species are therefore not reported in this chapter. However, the survey methodology will be

ID	Inspectorate's comments	Response
	fish and other freshwater species, where likely significant effects could occur. This should be supported by desk study information and surveys as necessary. Effort should be made to agree the methodology with the relevant consultation bodies.	agreed with stakeholders and they will be reported in the ES to be submitted with the application for development consent where relevant.
3.2.7	The Scoping Report does not identify Snape Warren SSSI as a receptor although it is located within 10km of the red line boundary and also located on Figure 2.3.1. The ES should assess significant effects to this receptor where they are likely to occur.	**Figure 2.3.1 Designated Sites** has been included in this chapter.
3.2.8	Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.	Noted. Such data will be provided in a confidential annex to the ES to be submitted with the application for development consent. All surveys for relevant ecological receptors are ongoing or have not yet commenced at the time of writing (see Table 2.3.6), and they are therefore not presented in a confidential annex to this chapter.

Consultation and Project Engagement

2.3.4.2 Proposed ecology survey methodologies were shared with Natural England in April 2022 and a response received in May 2022. Subsequent discussions with Natural England confirmed that impacts on great crested newt (*Triturus cristatus*) could be managed through the District Licencing Scheme for Suffolk and therefore specific surveys for great crested newt were not required. Throughout the course of the Proposed Project there have been regular (typically monthly) meetings between Natural England and National Grid. Early discussion with RSPB was also held during 2022. A primary outcome of these discussions was confirmation that North Warren RSPB Reserve/Leiston-Aldeburgh SSSI would be traversed via a trenchless technique rather than open cut trenching.

2.3.5 Approach and Methodology

2.3.5.1 **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** sets out the overarching approach which has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the preliminary ecology and biodiversity assessment.

Guidance Specific To The Ecology And Biodiversity Assessment

2.3.5.2 The preliminary ecology and biodiversity assessment has been carried out in accordance with the following good practice guidance documents:

- Guidelines for Ecological Impact Assessment from the Chartered Institute for Ecology and Environmental Management (CIEEM) (Ref. 2.3.3);
- Guidance on Habitats Regulations Assessment on the UK Government website (https://www.gov.uk/guidance/appropriate-assessment) (Ref. 2.3.27); and
- Planning Inspectorate Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (Ref. 2.3.26).

2.3.5.3 The principal guidance is the CIEEM ecological impact assessment guidance, which is summarised below:

- Ecological features that are both present and might be affected by the proposed Suffolk Onshore Scheme are identified (both, those likely to be present at the time works begin and those predicted to be present under a future baseline) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions (Section 2.3.8).
- The importance of the identified ecological features evaluated, placing their relative biodiversity and nature conservation value into geographic context. This is then used to define the relevant ecological features that need to be considered further within the assessment process.
- The changes or perturbations predicted to result as a consequence of the proposed Suffolk Onshore Scheme (i.e., the potential impacts), and which could potentially affect relevant ecological features are identified and their nature described. Established good-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account.
- The likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified (Section 2.3.10).
- Measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included (Section 2.3.9).
- Any residual effects of the proposed Suffolk Onshore Scheme are reported; and

- Scope for ecological enhancement is considered.

Baseline Data Gathering and Forecasting Methods

2.3.5.4 The desk study included a search for:

- International statutory nature conservation sites (e.g., SAC, SPA and Ramsar sites) within 10 km of the proposed Suffolk Onshore Scheme draft Order Limits and 30 km for SACs designated for bats. Note that there are no SACs designated for bats within 30 km of the proposed Suffolk Onshore Scheme, the nearest being Paston Great Barn SAC over 70 km from the Suffolk Onshore Scheme draft Order Limits;
- National statutory nature conservation designations (e.g., SSSI, excluding geological SSSIs, National Nature Reserve (NNRs) and Local Nature Reserves (LNRs)) within 5 km, also referencing Natural England Impact Risk Zones for SSSIs on the Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref. 2.3.32);
- Non-statutory nature conservation designations (e.g., Local Wildlife Sites (LWS) and Roadside Nature Reserves (RNR)) within 2 km; and
- Records of protected and notable species and notable habitats (e.g., Habitats of Principal Importance Section 41 of the NERC Act) have also been identified up to 1km (for most species) and 500 m (for habitats and great crested newts) from the proposed Suffolk Onshore Scheme draft Order Limits.

2.3.5.5 Note that these zones are not intended to be exclusive and if impact pathways to sites further afield are identified these will also be considered. The surveys that are being undertaken or planned to be undertaken at the time of writing are shown in Table 2.3.6. The majority of these are underway or have yet to commence, and therefore the amount of field survey data in this PEIR is limited. Great crested newt surveys are not being undertaken as it has been agreed with Natural England that impacts on that species can be addressed through the District Level Licensing Scheme.

Table 2.3.6: Survey Summary (Type, Extent and Timing)

Survey Type	Spatial Extent	Survey Period	Status at Time of Writing
Extended Phase 1 Habitat Survey	All habitats within proposed Suffolk Onshore Scheme draft Order Limits	Any, but April to August preferred	Completed, based on a combination of detailed resolution aerial overflight photography and physical walkover of the route.
Detailed (Phase 2) botanical survey	Notable habitats identified within the proposed Suffolk Onshore Scheme by extended Phase 1 Habitat Survey	Any, but April to August preferred	Commenced, with a targeted survey for uncommon arable plants. Will be completed during 2024.
Hedgerow	Hedgerows identified within the Suffolk	Any, but April to August preferred	Survey partially complete, remainder to be completed in spring 2024.

Survey Type	Spatial Extent	Survey Period	Status at Time of Writing
	Onshore Scheme by extended Phase 1 Habitat Survey		
Invasive non-native species	All habitats within proposed Suffolk Onshore Scheme draft Order Limits	May to August	Completed as part of the field Phase 1 Habitat Surveys.
Terrestrial invertebrates	Key habitats within the proposed Suffolk Onshore Scheme identified by extended Phase 1	March to October	Not yet commenced; will be undertaken in 2024.
Common reptiles (presence/absence and population)	Suitable habitat within the proposed Suffolk Onshore Scheme	March to October. Optimal – April, May, September	Not yet commenced; will be undertaken in spring and/or autumn 2024.
Intertidal birds (Low/High Tide Counts)	Tidal counts at landfall locations.	Tidal counts throughout year	Landfall to be west of RSPB North Warren Reserve, meaning direct intertidal bird survey is now less relevant.
Wintering birds (Field counts / inland walkovers)	Winter walkovers targeting temporary and permanent infrastructure	November to March	Ongoing. First season of surveys completed November 2022 to March 2023 complete. A summary of the first season of survey results is provided in this chapter with a report to be produced for the ES. A second season of surveys is being undertaken in autumn/winter 2023/24.
Breeding birds (common bird census, CBC), in addition to specific surveys for hobby (*Falco subbuteo*), barn owl (*Tyto alba*) and nightjar (*Caprimulgus europeaus*)	Common bird census targeting permanent infrastructure	March to July	Completed for 2023 season. A summary is provided in this chapter with a report for both 2023 and 2024 seasons to be produced for the ES. A second season of surveys will be undertaken in 2024.
Bats (presence/absence	Trees suitable for roosting bats to be unavoidably	May to September, May to	Not yet commenced; need not yet determined as will depend on impacts on trees

Survey Type	Spatial Extent	Survey Period	Status at Time of Writing
emergence/re-entry)	impacted by the proposed Suffolk Onshore Scheme	August Optimal	and their bat roost potential as design of Proposed Project evolves. Surveys will be undertaken in 2024 as necessary to inform the ES.
Bats (tree climbing inspection)	Trees suitable for roosting bats to be unavoidably impacted by the proposed Suffolk Onshore Scheme	Anytime	Not yet commenced; need not yet determined as will depend on impacts on trees as design of Proposed Project evolves and their bat roost potential. Surveys will be undertaken in 2024 as necessary to inform the ES.
Bats (activity surveys/advanced survey techniques)	Transects to target permanent and temporary infrastructure, and identify impacts to rarer species	April to October	Commenced in August 2023 and will resume in summer 2024.Report to be provided with the ES.
Hazel dormouse	Suitable hedgerows to be intersected by the proposed Suffolk Onshore Scheme and adjacent woodlands	April to November	Nest tubes installed in July 2023. Will continue through 2024 until May 2024. Report to be provided with the ES.
Water vole	Where watercourses are to be crossed or adjacent to the proposed Suffolk Onshore Scheme draft Order Limits.	Mid-April to the end of the June and between July to the end of September	Not yet commenced. Will commence spring 2024. Report to be provided with the ES.
Otter	Where watercourses are to be crossed or adjacent to the proposed Suffolk Onshore Scheme draft Order Limits	Any time of year, optimal period May to September	Not yet commenced. Will commence spring 2024. Report to be provided with the ES.
Badger (presence/absence)	All habitats within proposed Suffolk Onshore Scheme draft Order Limits and adjacent	Anytime	Not yet commenced. Signs of badger have been recorded during the extended Phase 1 Survey. Need for presence/absence

Survey Type	Spatial Extent	Survey Period	Status at Time of Writing
			of setts will be determined as design of the Proposed Project evolves. Report to be provided with the ES.
In river aquatic ecology surveys (fish and aquatic invertebrates)	Where watercourses are to be crossed or adjacent to the proposed Suffolk Onshore Scheme draft Order Limits.	Anytime	Not yet commenced. Will commence in 2024. Report to be provided with the ES.

2.3.5.6 A brief descriptive summary of the proposed surveys outlined in Table 2.3.6 is provided below for each survey type.

Extended Phase 1 Habitat Survey

2.3.5.7 An extended Phase 1 habitat Survey has been undertaken to provide an environmental baseline for the scheme, identify any areas that are of potential importance for nature conservation and assist with assessing which Phase 2 surveys (see Table 2.3.6) would be deemed necessary to further evaluate the potential impact of the proposed Suffolk Onshore Scheme. Due to the size of the area requiring survey, an aerial overflight was undertaken which produced high-resolution photography. This was used to create initial habitat maps. These were then refined and ground-truthed through walkovers.

2.3.5.8 The walkovers involved teams of suitability qualified ecologists, who mapped the habitats based on Phase 1 classifications as described in the Handbook for Phase 1 Habitat Survey (Ref. 2.3.17). While on site any incidental features highlighted as being of ecological interest and are suitable for protected species were also target noted, particularly regarding trees with bat roost potential and locations of badger setts and activity.

2.3.5.9 The survey covered the entirety of the proposed Suffolk Onshore Scheme draft Order Limits and was primarily undertaken during June and July 2023, as this is when deciduous and annual plant species are identifiable.

Phase 2 botanical survey

2.3.5.10 Following the extended Phase 1 Habitat Surveys a detailed botanical survey was identified to be necessary, specifically for areas of arable land where uncommon arable weeds were identified in field margins. This survey was undertaken after the Phase 1 Habitat Survey in July and August 2023, as arable plants can be more difficult to identify after this time. Further survey will be undertaken in spring/early summer 2024.

2.3.5.11 The North Warren RSPB Reserve is a botanically diverse site, however as it will be traversed by a trenchless technique (drilling beneath the reserve) it was not deemed necessary to survey the vegetation on the surface in any detail.

Hedgerow

2.3.5.12 As part of the extended Phase 1 Habitat Survey all hedgerows within the scheme were noted and flagged for further survey. Detailed hedgerow surveys were used to establish the state of hedgerows, in terms of length and condition, and character of species present within the hedgerows. These were assessed against criteria detailed in The Hedgerow Regulations 1997 (Ref. 2.3.33) to identify which hedgerows are of particular importance for wildlife and landscape and so worthy of protection and conservation. The broad definition of a hedgerow as defined in Ref. 2.3.5 is "*Any boundary line of trees or shrubs over 20m long and less than 5m wide, provided that at one time the trees or shrubs were more or less continuous. It includes an earth bank or wall only where such a feature occurs in association with a line of trees or shrubs*."

2.3.5.13 Suitably qualified ecologists walked the lengths of hedgerows identified on site, and surveyed sections of the hedge noting woody species present, ground flora present and standard trees, as well as any breaks in the hedge, or connectivity to other hedgerows. This species list will then be used as a condition assessment and the hedgerow is assigned a richness value. The timing of these surveys was between April and August as this is when deciduous and annual plant species are identifiable. For areas where access was not possible in 2023, these will be completed in 2024.

Invasive non-native species

2.3.5.14 Any invasive non-native plant species were identified as part of the extended Phase 1 Habitat Survey, and the location of all species, density of the stand and any other identifying features was noted.

Terrestrial invertebrates

2.3.5.15 Sub-sites suitable for terrestrial invertebrate surveys will be selected based on their nature conservation value and on the presence of semi-natural habitats such as unimproved and semi-improved grassland, woodland and wetland vegetation. Recording of species uses various methods, such as sweep netting, sieving dead wood/leaf litter and pitfall traps as per published guidelines and identification, where possible, should take place in the field, however, if this is not possible, using microscopes within a lab.

2.3.5.16 The field survey would aim to sample as wide a range of invertebrates as possible, which would involve the use of the following standard equipment and recommended methods:

- Fine-meshed and calico sweep nets to sample flower-rich and other grassland and tall herb/ruderal vegetation;
- Hand collection of specimens on the ground and from various types of vegetation as the opportunity arose; and
- Beating of scrub, climbers and young trees with beating tray and beater at various points within the study area.

2.3.5.17 The surveys will follow sampling protocols suitable for capturing ground dwelling invertebrates, likely requiring three survey visits spread across spring and summer 2024, as detailed in Drake et al (2007) Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation (Ref. 2.3.8) by experienced entomologists. The sampling protocols consist of grubbing or hand searching refugia, sweep netting, and visual checks (spot observations).

Common reptiles

2.3.5.18 Reptile surveys will be undertaken to determine the presence/absence of reptiles in suitable habitat such as rough grassland, verges, scrub and dunes through the deployment of artificial refugia. The use of artificial refugia is the most commonly used method for locating reptiles. All reptiles tend to use certain materials that warm up in the sun and the use of artificial refugia exploits this tendency by providing a suitable basking site, as well as an area to avoid predation (Herpetofauna Workers Manual; Ref. 2.3.11).

2.3.5.19 The refugia will be deployed and allowed at least two weeks for the reptiles to become used to them. They will be distributed across the site where suitable habitat is present in a suitable density (10 per hectare as a minimum). The refugia will be a combination of corrugated metal-based roofing material sheets and roofing felt (measuring approximately 0.5 m by 0.5 m). These will be placed in sunny locations near to cover, such as the edge of scrub and woodland patches, grassy banks and south facing areas. Suitable habitat to be visually inspected for evidence of reptile activity, including dead/alive reptiles and shed skins. Potential basking spots should be targeted, including the edge of hardstanding areas, pathways, short grassland habitats and drain sides (Froglife Advice Sheet 10: Reptile Survey; Ref. 2.3.10).

2.3.5.20 To establish presence or absence of reptiles, seven visits in suitable weather conditions (within a constant temperature range of between 10 – 20°C) will take place between March and September. Appropriate weather is typically encountered in the spring and late summer/autumn. All refugia will be checked and any reptile species will be recorded (Survey Protocols for British Herpetofauna; Ref. 2.3.21). Since reptiles sometimes use different habitats at different times of day, the survey visits will be undertaken at different times of day.

2.3.5.21 Following these initial seven surveys up to 20 surveys can be undertaken to establish population size class for the survey area. To determine the population class size of any present reptile species the adult peak count result across all surveys as averaged for each refugia.

Wintering birds

2.3.5.22 The field surveys for wintering birds are based on the transect methodologies detailed by Bibby et al (2000) Bird Census Techniques (Ref. 2.3.1) and Gilbert et al (1998) Bird Monitoring Methods (Ref. 2.3.12). During each survey visit, a suitably experienced ornithologist walked a transect route through the survey area based on rights of access and the best route to cover the site. For the 2022-2023 season these generally involved surveys from Public Rights of Way (PRoW), although given the number of PRoW in the area this still enabled good coverage. Transect routes were interspersed with stops at viewing points during which the survey area was scanned for birds using binoculars. Visual counts of all bird species encountered were made, with birds that could not be located visually identified through calls or songs. The species present and their behaviours are recorded on field maps using standard British Trust for Ornithology (BTO) species codes and behaviour notation.

2.3.5.23 While such surveys primarily targeted permanent infrastructure locations (i.e., the proposed Converter stations), the entire accessible area of the proposed Suffolk Onshore Scheme was covered, as temporary works can also have significant effects.

Intertidal birds

2.3.5.24 A low tide count was used to record all waterbird species within the intertidal area of the proposed Suffolk Onshore Scheme and a buffer of up to 500m. The survey area was divided into sectors viewed from vantage points with birds recorded mapped on a 1:25,000 Ordnance Survey map. These surveys were undertaken within two hours of low tide, avoiding times earlier than one hour after sunrise or one before sunset to avoid dusk and dawn flighting. Spring tides were targeted as the lowest tides expose the greatest possible areas of intertidal mud with which foraging by waders and wildfowl is associated. A suitably experienced ornithologist undertook these surveys monthly through the year.

Breeding birds

2.3.5.25 Breeding bird survey uses a territory-mapping approach to estimate the number and positions of territories of each species present in a survey area during the breeding season (March to July). Survey routes were used to target areas where there will be new permanent infrastructure, although as for wintering birds all suitable habitat within the proposed Suffolk Onshore Scheme was covered as temporary works can also have significant effects. Survey routes were mapped, and the direction walked alternated on each visit, to ensure that all areas are covered at various times of day across the duration of the survey. Two suitably qualified ecologists undertook a walkover of the survey area to record all species of breeding birds present, and detail bird behaviour, including singing, calling, flights and movements between areas, carrying food, nest building, aggressive encounters and other bird behaviour. For part of the 2023 breeding bird survey this was done from PRoW, but as with the wintering bird surveys provided good coverage. While a standardised number of survey visits for Common Bird Census in respect of development has not been published, a minimum of five visits is the core survey component.

2.3.5.26 There is suitable nesting habitat for the WCA Schedule 1 species hobby (*Falco Subbuteo*) present in proximity to the proposed Suffolk Onshore Scheme. While presence and territories can be detected by the CBC methodology above, an additional late season visit (Mid-August to September) will also be conducted as specified within Hardy et al (2013), Raptors a Field Guide to Survey and Monitoring (Ref. 2.3.13) to ensure detection and assessment of any breeding pairs that may be present.

2.3.5.27 Woodlark (*Lullula arborea*) is potentially present as a species for which nearby SPAs, Ramsars and SSSIs are designated. Suitable habitats have been targeted with an additional early season (mid-February to mid-March) visit in addition to the CBC survey.

2.3.5.28 Although the RSPB North Warren Reserve is suitable for marsh harrier, the crossing will be undertaken using a trenchless cabling technique. As such, no dedicated breeding marsh harrier survey will be undertaken.

Nightjar

2.3.5.29 Nightjar (*Caprimulgidae*) is potentially present as a species for which nearby SPAs, Ramsars and SSSIs are designated and similar to hobby has additionally survey requirements. Suitable habitats were targeted by nocturnal transect surveys during May to July as an adaptation of the method within Gilbert et al (1998) Bird Monitoring Methods (Ref. 2.3.12) and subject to at least two (preferably three) surveys in suitable weather conditions. Such surveys can also record nightingale (*Luscinia megarhynchos*) and other nocturnal bird species.

Barn owl

2.3.5.30 Stage 1 and 2 surveys for the presence / likely absence and nesting status of barn owl will follow guidance published by Shawyer (2011) Barn Owl Survey Techniques (Ref. 2.3.22), consisting of the following components:

- Stage 1 – site walkover, to record features of the habitat which may support barn owls; and
- Stage 2 – a detailed investigation of the features identified during Stage 1 to record potential nest sites (PNS), active roost sites (ARS), temporary rest sites (TRS), and potential foraging habitat (PFH).

Bat roost surveys

2.3.5.31 Potential bat roost features were identified as part of the extended Phase 1 Habitat Survey and a preliminary roost assessment (PRA) undertaken on these features and assigned a suitability, low, moderate or high, based on the individual feature.

2.3.5.32 Following the PRA trees with moderate or high potential for roosting bats will be confirmed as to whether they need further survey, based on whether they are likely to be affected by the proposed Suffolk Onshore Scheme. If they do require further surveys emergence/re-entry surveys would be undertaken. The minimum number of visits is determined by the suitability and outlined in the table below and is based on Collins (ed) (2016) Bat Surveys for Professional Ecologists (Ref 2.3.4).

Table 2.3.7: Minimum number of visits to determine presence/absence of bat roosts in trees/ woodland and buildings/ structures (subject to review as an updated version of Ref 3.3.4 was published in September 2023).

Feature	Negligible Suitability	Low Suitability	Moderate Suitability	High Suitability/ Confirmed Roost
Trees/ woodland	No further survey	No further survey	Two survey visits – one at dusk and one at dawn	Three survey visits – either dusk or dawn (with at least one dawn visit)

2.3.5.33 Surveyors will be strategically positioned to collectively allow full visibility of all features suitable for roosting bats on the buildings, structures and/or trees. Visual observations of bats entering or leaving a structure will be supported by ultrasonic full spectrum bat detector recordings. Dusk emergence surveys start approximately 15 mins before sunset and end one and a half to two hours after sunset. Dawn re-entry surveys start one and a half to two hours before sunrise and end 15 mins after sunrise. Surveys are only to be undertaken May to September during suitable weather conditions, i.e. in temperatures above 7°C and in the absence of rain, strong wind and fog. Where roosting is confirmed a total of three dusk or dawn surveys were then undertaken (where time allowed) to help characterise the roost/s (Collins (ed) (2016) Bat Surveys for Professional Ecologists; Ref. 2.3.4).

Bat activity transect surveys

2.3.5.34 Bat activity transects are being undertaken of suitable habitats on site. These are focussed on areas where permeant infrastructure will be built along the route but also cover areas of temporary habitat loss. The proposed Suffolk Onshore Scheme has been divided into several transects designed to include potential flight paths or foraging areas within the proposed Suffolk Onshore Scheme. From August 2023, two surveyors walked a transect route that will include a series of 'spot counts' at pre-determined points along the transects, located at potentially important features with regards to foraging or commuting bats.

2.3.5.35 Two survey visits have been undertaken during July/August and September/October 2023 and a third visit will be undertaken in May/June 2024. This is the necessary level of survey effort for low suitability habitat, but also reflects the fact that the vast majority of habitat impacts will be temporary, with relatively little permanent habitat loss from habitats suitable for bats.

2.3.5.36 At each point surveyors will record bat activity for three minutes using bat echolocation detectors to help determine which species were present. All activity encountered whilst walking between points will also be noted.

2.3.5.37 The starting points and walked direction of the transects will vary during each survey visit in order to ensure different areas of the transect are walked close to dusk or dawn. Dusk surveys will be carried out from sunset to at least two hours after sunset.

2.3.5.38 The time, location, number, species (where possible) and direction of flight will be recorded for each bat pass (discrete burst of echolocation heard or bat activity observed) encountered during the survey. Surveyors will record the echolocation calls detected to a digital recorder (Elekon Batlogger M, Wildlife Acoustics Echometer Touch and Edirol) to allow use of sound analysis software (Bat Sound and Kaleidoscope) to verify bat calls where required. GPS points of bat activity will be recorded using bat detectors such as Elekon Batlogger M and Echometer Touch and to provide the detailed distribution maps of activity.

2.3.5.39 Static bat detectors will be used to supplement transect survey and will be placed in representative habitats to record bat activity over a longer period of time. Static devices will be either pole mounted or tree mounted at least 1m above ground level and with the detection zone in front of the microphone free of any obstructions (e.g. branches, leaves). Static detectors will generally be deployed on five consecutive nights in tandem with activity transect surveys. Recordings will be analysed to determine species present and activity with an estimate of relative bat activity, known as a 'bat activity index'.

Hazel dormouse

2.3.5.40 Survey methodology for dormice (*Muscardinus avellanarius*) reflects the life-cycle of this species and requires the installation of artificial nest boxes or tubes in suitable woodland and hedgerows, which are checked on a monthly basis by a suitably qualified ecologist for the presence of dormouse nests and individuals.

2.3.5.41 Usually at least 50 nest tubes should be deployed at a spacing of 15-20m intervals. Preferably they should be kept in place for the majority of the active season (April to November) and checked once every other month to maximise the chance of detecting any dormice present (Bright et al (2006) The Dormouse Conservation Handbook; Ref. 2.3.3). In this case, nest boxes have been installed from July 2023 and will remain until at least May 2024.

Water Vole

2.3.5.42 Water Vole surveys will be undertaken on aquatic habitats that are to be crossed by the proposed Suffolk Onshore Scheme or lie directly adjacent to the proposed Suffolk Onshore Scheme. Any survey will not only cover the crossing point but a stretch of watercourse 100m either side of the crossing point will be covered where possible. These will be subject to a detailed search for water vole field signs, including:

- Latrine sites – distinct piles of water vole droppings found near nest sites or burrows, at the ranges of territorial boundaries and where the animals enter and leave the water.
- Feeding stations – areas with distinct neat piles of chewed lengths of vegetation along pathways or haul out platforms along the water's edge.
- Burrows – above and below water with a cropped "garden" or "lawn" around the burrow entrance.
- Paths and runs – along the water's edge, runs in the vegetation and footprints in soft mud.
- Sightings, sounds entering the water.

2.3.5.43 A minimum of two surveys to determine water vole presence/likely absence will be undertaken; between mid-April to the end of June, and between July to the end of September 2024. Surveys will not be undertaken following periods of heavy rain (taken to be >0.3 inches of rain falling in one hour) and/or high-water levels, or after bankside or in-channel management has taken place. These factors can obscure/remove signs of water vole presence and result in false negative survey results (Strachan & Moorhouse (2011) Water Vole Conservation Handbook; Ref. 2.3.23).

Otter

2.3.5.44 Otter surveys will be undertaken on aquatic habitats that are to be crossed by the proposed Suffolk Onshore Scheme or lie directly adjacent to the proposed Suffolk Onshore Scheme. At least 100m upstream and downstream of the watercourse from the footprint of the potential impact (direct or indirect) will be surveyed. These locations will be subject to detailed searched for field signs of otters indicating presence/absence. These field signs include:

- Spraints – characteristic sweet-smelling, black tar-like (where fresh/relatively recent i.e. within a few weeks) or grey crumbly (when old) faecal deposits usually containing fish scales, bones and occasionally invertebrate exoskeletons and bird feathers.
- Footprints – in soft substrate, typically asymmetrical and showing five toes arched around a large pad and, depending on substrate, webbing and claw marks (coarser substrates do not often enable the identification of otter footprints).
- Feeding remains – which may include partially eaten fish, frogs, piles of mussel shells or crayfish remains.
- Slides and haul-outs – routes into and out of the water, which are usually associated with terrestrial routes such as short cuts around meanders or along traditionally used otter paths/routes.
- Couches and hovers – above ground resting place which are usually associated with cover such as dense scrub, rushes or reed, flood debris or fallen trees.

- Holts – below ground resting site, usually associated with spraints which can be important for breeding (natal holts) where other signs are usually absent.

2.3.5.45 Otter surveys can be carried out at any time of year, though the period May to September is optimal when water levels are less variable. Surveys will not be undertaken following periods of heavy rain and/or high-water levels as these factors can obscure/ remove signs of otter presence and result in false negative survey results. A minimum of one survey visit will be undertaken of each suitable aquatic or terrestrial habitat feature.

Badger

2.3.5.46 Badger surveys include an initial habitats assessment to be undertaken within the footprint of the proposed Suffolk Onshore Scheme (including all temporary and permanent works) and all suitable habitat within 50m to 100 m of the proposed Suffolk Onshore Scheme draft Order Limits for badger field signs. This was undertaken as part of the extended Phase 1 Habitat Survey.

2.3.5.47 Signs of badgers' presence on a site include setts (categorised as main, annexe, subsidiary or outlier), latrines (dung pits), tracks, hairs caught on fences and vegetation, footprints, distinctive pathways through vegetation, scratching posts, feeding signs, snuffle holes in grassland and day laydowns (Harris et al (1989) Surveying Badgers; Ref. 2.3.14). If two or more main setts are present within or up to 100m from the proposed Suffolk Onshore Scheme draft Order Limits, then a badger bait marking study will be undertaken.

Assessment Criteria

Sensitivity

2.3.5.48 The sensitivity of sites uses established value systems (e.g., SSSIs are all of national importance and thus are classified as being sensitive at that scale) and reflects the geographical context of the valuation. The categories shown in Table 2.3.8 are applied to give geographic context.

Table 2.3.8: Examples of criteria used to evaluate important ecological features in a defined geographical context

Geographical level at which ecological feature is important	Example of criteria
International (Very high)	An internationally important site, e.g. SPA, SAC or Ramsar; a regularly occurring population of an internationally important species (listed on Annex IV of the Habitats Directive).
National (High)	A nationally designated site, e.g. SSSI, or a site considered worthy of such designation; a large regularly occurring population of a nationally important species.
Regional (Medium)	An ecological feature identified in the local BAP. A smaller area of local BAP habitat which are essential to maintain the viability of a larger whole; non-statutory designated sites; a

Geographical level at which ecological feature is important	Example of criteria
	regularly occurring, locally significant number of a nationally important species. An ecological feature identified as of priority within Section 41 of the NERC Act 2006.
District (Low)	An ecological feature that is scarce within the district or borough or which appreciably enriches the district or borough habitat resource.
Local (Very low)	A good example of a common or widespread ecological feature in the local area.
Negligible	No or very limited ecological value.

2.3.5.49 The local (very low) criterion adds a level of detail that is not present in the sensitivity scale described in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** and reflects that there is a tier of ecological sensitivity between district and negligible.

Magnitude

2.3.5.50 In line with section 1.2 in the CIEEM guidelines (Ref. 2.3.34), the terminology used within this chapter draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of this Chapter these terms are defined as follows:

- Impact – actions resulting in changes to an ecological feature. For example, construction or decommissioning activities of a development removing a hedgerow.
- Effect – outcome resulting from impact acting upon the conservation status or structure and function of an ecological feature. For example, the effects on a population of bats as a result of the loss of a bat roost.

2.3.5.51 When describing potential impacts consideration has been given to the following characteristics likely to influence this (Sections 5.11-5.18 in the CIEEM guidelines (Ref. 2.3.34)):

- Positive / Negative – i.e. is the change likely to be in accordance with nature conservation objectives and policy:
  - Positive – a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value.
  - Negative – a change that reduces the quality of the environment, e.g. destruction of habitat.
- Extent – the spatial or geographical area or distance over which the impact/effect occurs;
- Magnitude – the 'size', 'amount' or 'intensity' and 'volume' of an impact - this is described on a quantitative basis where possible;

- Duration – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- Timing and frequency – i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons; and
- Reversibility – i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

2.3.5.52 Cumulative effects have been assessed and are those occurring from several sources (also known as inter-relationships) and/or the combined effects of other developments in the area. These are reported within **Volume 1, Part 2, Chapter 13, Suffolk Onshore Scheme Intra-project Cumulative Effects** and **Volume 1, Part 2, Chapter 14, Suffolk Onshore Scheme Inter-project Cumulative Effects**.

Significance of effects

2.3.5.53 The potential magnitude of effect is discussed in Table 2.3.1. This is then related to an overall conclusion of significant or not significant. This is a matter for judgment but in general minor positive or adverse effects are not significant, while moderate beneficial or adverse effects may be significant. Major beneficial or adverse effects will normally be significant.

Table 2.3.9: Relating CIEEM assessment terms to those used in other chapters

Effect classification terminology used in other chapters	Equivalent CIEEM assessment
Major beneficial (positive)	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Moderate beneficial (positive)	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor beneficial (positive)	1) Permanent addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.

Effect classification terminology used in other chapters	Equivalent CIEEM assessment
Negligible beneficial (positive)	1) Temporary addition of, improvement to, or restoration of a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible adverse (negative)	1) Temporary/reversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Minor adverse (negative)	1) Permanent/irreversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Moderate adverse (negative)	1) Temporary/reversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
Major adverse (negative)	1) Permanent/irreversible damage to a biodiversity resource; and 2) the extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.

2.3.5.54 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** the general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels.

Assumptions and Limitations

2.3.5.55 The major limitations at this stage are as follows:

- Large parts of the proposed Suffolk Onshore Scheme only became accessible from June 2023 except from PRoW. Some surveys that can be done from a slight distance (such as bird surveys) could be undertaken from PRoW, but other surveys were unable to commence until access was obtained to all relevant land parcels;
- Two full seasons of non-breeding and breeding bird survey are required to inform the DCO ES. At time of writing, the first season of non-breeding bird survey is complete while the first season of breeding bird survey is being completed. The second season of both bird surveys have yet to commence. Currently, there is thus an incomplete picture of bird use of the proposed Suffolk Onshore Scheme.

- It has been assumed that Leiston-Aldeburgh SSSI/North Warren RSPB Reserve, will be traversed via a trenchless cabling technique rather than open cut trenching.

2.3.5.56 For the ES these limitations will have been addressed. However, since they remain in place at time of writing, no definitive conclusions have been reached in this chapter, which is in line with a PEIR where all conclusions are by definition preliminary.

2.3.6 Basis of Assessment

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

2.3.6.2 Details of the available flexibility and assessment scenarios are presented in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project** and **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology.**

Flexibility Assumptions

2.3.6.3 The main preliminary assessments have been undertaken based on the description of the Proposed Project provided in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for preliminary effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or draft Order Limits.

2.3.6.4 The assumptions made regarding the use of flexibility for the main assessment, and any alternatives assumptions are set out in Table 2.3.10 below. Should the flexibility assumptions alter the results of the preliminary assessment of effects, this has been noted within the preliminary assessment section (see Section 2.3.10).

Table 2.3.10: Flexibility Assumptions

Element of flexibility	Proposed Project assumption for initial preliminary assessment	Flexibility assumption considered
Lateral LoD HVDC cables	High Voltage Direct Current (HVDC) cables laid anywhere within the lateral LoD	The maximum flexibility has already been assessed under the preliminary assessment in section 2.3.9 of this chapter.
Lateral LoD Saxmundham Converter Station	Proposed Project Saxmundham Converter Station to be constructed within the footprint based on the indicative location of the Converter Station as shown in **Figure 1.4.2 Saxmundham Converter Station Indicative Location**	Proposed Project Saxmundham Converter Station could be constructed anywhere within the lateral LoD.

Consideration of Scenarios and Options

2.3.6.5 There are three scenarios which have been considered by the preliminary assessment. These are:

- Friston Substation is installed either under the current consent sought by Scottish Power Renewables (SPR) or as part of the Proposed Project, as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project;** and
- Saxmundham Converter Station construction or decommissioning access is taken off the B1121 South Entrance (bellmouth BM09) or the B1121 Main Road (bellmouth BM12 via BM-11 and BM10), as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**; and
- Saxmundham Converter Station permanent access is taken off the B1121 South Entrance (bellmouth BM09), B1121 Main Road (bellmouth BM12 via BM-11 and BM10) or off the B1121 The Street (bellmouth BM13), as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**.

2.3.6.6 Table 2.3.11 details where these scenarios are relevant to the preliminary ecology and biodiversity assessment and how they have been assessed and reported in section 2.3.10, preliminary assessment of effects.

Table 2.3.11: Considerations of Scenarios

Assessment scenario	How it has been considered within the preliminary assessment
Friston Substation	Whether Friston Substation is built as part of the Scottish Power Renewable (SPR) Schemes (East Anglia ONE North Offshore Windfarm and East Anglia TWO Offshore Windfarm) consent (and therefore becomes part of the future baseline) or part of the Proposed Project has been considered in the preliminary assessment. Where the potential ecology and biodiversity effect associated with this difference is considered to have the potential to result in a different magnitude of effect or significance for a specific receptor, this is identified in the preliminary assessment.
Saxmundham Converter Station construction or decommissioning access	The construction or decommissioning access options have been considered in the preliminary assessment. Where the potential ecology and biodiversity effect associated with a specific access option is considered to result in a different magnitude of effect or significance for a specific receptor, this is identified in the preliminary assessment.
Saxmundham Converter Station permanent access	The permanent access options have been considered in the preliminary assessment. Where the potential biodiversity and ecology effect associated with a specific access option is considered to result in a different magnitude of effect or significance for a specific receptor, this is identified in the preliminary assessment.

2.3.6.7 Within the ecology and biodiversity chapter of the PEIR, there are four options considered which are summarised below. Within the preliminary Ecology and Biodiversity assessment, the option numbers below are referred to:

- Option 1: Proposed Project Saxmundham Converter Station and SPR Friston Substation – this assumes one converter station for the Proposed Project at Saxmundham and Friston Substation comes forward under the current SPR consent becoming part of the future baseline;
- Option 2: Proposed Project Saxmundham Converter Station and Proposed Project Friston Substation – this assumes one converter station for the Proposed Project at Saxmundham and that Friston Substation is built as part of the Proposed Project;
- Option 3: Proposed Project with co-location converter stations and SPR Friston Substation – this assumes up to three converter stations at Saxmundham and Friston Substation comes forward under the current SPR consent becoming part of the future baseline; and
- Option 4: Proposed Project with co-location converter stations and Proposed Project Friston Substation - this assumes up to three converter stations at Saxmundham and that Friston Substation is built as part of the Proposed Project.

Coordination including Co-location

2.3.6.8 The Proposed Project includes an option for co-location with National Grid Ventures proposed Nautilus and LionLink (previously known as EuroLink) interconnector projects as explained in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**.

2.3.6.9 Table 2.3.12 details where the option of co-location is relevant to the preliminary Ecology and Biodiversity assessment and how this option has been assessed and reported in Section 2.3.10, preliminary assessment of effects.

Table 2.3.12: Consideration of Co-location

Element of co-location	How it has been considered within the preliminary assessment
HVDC ducts	The HVDC ducts have been considered as part of the Proposed Project and the Proposed Project with co-location within the preliminary assessment. The maximum working width for the HVDC corridor has been assessed for the Proposed Project at 40 m and the maximum working width for the HVDC corridor has been assessed for the Proposed Project with co-location at up to 69 m.
HVAC ducts	The HVAC ducts have been considered as part of the Proposed Project and the Proposed Project with co-location within the preliminary assessment. The maximum working width for the HVAC corridor has been assessed for the Proposed Project at 63 m and the maximum working width for the HVAC corridor has been assessed for the Proposed Project with co-location at up to 131 m.
Saxmundham Converter Station	Saxmundham Converter Station has been considered as part of the Proposed Project, and the Proposed Project with co-location within the preliminary assessment as part of the consideration of scenarios identified in Table 2.3.11 above.

Element of co-location	How it has been considered within the preliminary assessment
Friston Substation	No option has been included for co-location as part of the Proposed Project. This is assessed cumulatively in **Volume 1, Part 2, Chapter 14, Suffolk Onshore Scheme Inter-project Cumulative Effects**.
Suffolk landfall	The landfall has been considered as part of the Proposed Project and the Proposed Project with co-location within the preliminary assessment. The LoD has been considered for both, the Proposed Project and the Proposed Project with co-location, therefore the maximum flexibility in landfall corridor width has been assessed.

Sensitivity Test

2.3.6.10 It is likely that under the terms of the draft DCO, construction or decommissioning could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the preliminary effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference, this is reported in Section 2.3.10, preliminary assessment of effects.

2.3.7 Study Area

2.3.7.1 The study area for ecological surveys includes the land within the proposed Suffolk Onshore Scheme draft Order Limits and appropriate ZOI, as described in the following sections.

2.3.7.2 The boundaries and zone for the ecology and biodiversity study area reflect standard industry good practice and the distances that statutory consultees would typically expect to be considered for identification of features external to the Suffolk Onshore Scheme that could be affected. This is informed by published guidance and professional judgement.

2.3.7.3 The nature of the Suffolk Onshore Scheme influences the study area as it determines the likely impact pathways and their zones of influence. As a precaution, all statutory national designated sites up to 5 km and non-statutory designated sites up to 2 km from the proposed Suffolk Onshore Scheme draft Order Limits were identified and considered, along with all internationally important sites up to 10 km distant.

2.3.7.4 However, most impacts will be restricted to the area within the proposed Suffolk Onshore Scheme itself, particularly due to habitat loss from the footprint of the temporary and permanent works. Some construction or decommissioning-period impacts from within the draft Order Limits can affect receptors a small distance beyond the draft Order Limits, notably noise (which could affect receptors up to 200 m from the source or beyond), and dust (which according to Institute of Air Quality Management guidance (Ref. 2.3.15) can significantly affect receptors up to 50 m from the source).

2.3.8 Baseline Conditions

Designated Sites

2.3.8.1 The information to inform Habitats Regulations Screening that constitutes **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report** of the PEIR identifies that there are five SPAs, SACs or Ramsar sites within 10 km of the proposed Suffolk Onshore Scheme draft Order Limits. These are Sandlings SPA, adjacent to the landfall and a construction or decommissioning compound; Outer Thames Estuary SPA, 860 m east of the landfall; Alde-Ore Estuary SAC/SPA/Ramsar site, 629 m south of the proposed Suffolk Onshore Scheme draft Order Limits; Minsmere-Walberswick SAC/SPA/Ramsar, 5.6 km north of the proposed Suffolk Onshore Scheme draft Order Limits; and Southern North Sea SAC, 1.5 km east of the landfall. **Volume 1, Part 5, Chapter 3, Habitat Regulations Screening Report** contains full descriptions of the interest features of these sites, but in summary:

- Sandling SPA – designated for its population of nesting nightjar and woodlark;
- Outer Thames Estuary SPA – designated for its population of non-breeding red-throated diver (*Gavia stellata*) and to protect foraging waters for tern species that nest elsewhere along the coast;
- Alde-Ore Estuary SPA - The site is designated for its breeding and wintering birds, including shelduck (*Tadorna tadorna*), wigeon (*Anas penelope*), teal (*Anas crecca*), gadwall (*Anas strepera*), shoveler (*Anas clypeata*) and herring gull (*Larus argentatus*);
- Alde-Ore Estuary Ramsar - The site is designated as a Ramsar site for its nationally-scarce plant species, assemblages of breeding and wintering wetland birds, and internationally important numbers of breeding lesser black-backed gull (*Larus fuscus*), and wintering avocet (*Recurvirostra avosetta*) and common redshank (*Tringa totanus*);
- Alde-Ore & Butley Estuaries SAC - The site is designated as an SAC for its coastal lagoons, perennial and annual shingle vegetation features.
- Minsmere-Walberswick Heaths & Marshes SAC – The site is designated for its heathland, its annual vegetation of drift-lines and its perennial vegetation of stony banks;
- Minsmere-Walberswick SPA - The site is designated for its breeding and wintering birds, including bittern (*Botaurus stellaris*), teal, marsh harrier (*Circus aeruginosus*), nightjar and greater white-fronted goose (*Anser albifrons*);
- Minsmere-Walberswick Ramsar site – The site is designated for its mosaic of marine, freshwater, marshland and associated habitats and for supporting nine nationally scarce plants and at least 26 red data book invertebrates;
- Southern North Sea SAC – designated for its population of harbour porpoise (*Phocoena phocoena*).

2.3.8.2 There are seven ecological SSSIs within 5 km of the proposed Suffolk Onshore Scheme draft Order Limits, the closest of which is Leiston-Aldeburgh SSSI located adjacent to the proposed Suffolk Onshore Scheme and covering the same area as Sandlings SPA. These are:

- Leiston-Aldeburgh SSSI – Designated for a variety of breeding and non-breeding birds including nightjar, woodlark, and white-fronted goose, as well as for coastal vegetated shingle, ditches, acid grassland, heathland, fens, wet woodland and outstanding dragonfly and vascular plant assemblages. It overlaps with Sandlings SPA and is adjacent to the proposed Suffolk Onshore Scheme and the landfall;
- Alde-Ore Estuary SSSI - Designated for a wide range of breeding and non-breeding birds as well as its invertebrate assemblage, littoral sediment, starlet sea anemone (*Nematostella vectensis*), lagoons, saltmarsh and vascular plant assemblage. It overlaps with Alde-Ore Estuary SPA and is 629 m south of the proposed Suffolk Onshore Scheme draft Order Limits;
- Gromford Meadow SSSI - designated for its lowland mire and rush pasture located 1.1 km from the proposed Suffolk Onshore Scheme draft Order Limits;
- Sizewell Marshes SSSI – designated for its breeding birds of damp grasslands, mire, fen, ditches and rush pasture, its invertebrate assemblage and its vascular plant assemblage. It overlaps with Minsmere-Walberswick SPA and is located 4.5 km from the proposed Suffolk Onshore Scheme draft Order Limits;
- Iken Wood SSSI - designated for its lowland mixed deciduous woodland, located 3.6 km from the proposed Suffolk Onshore Scheme draft Order Limits;
- Sandlings Forest SSSI – designated for its breeding nightjar and woodlark and overlapping with Sandlings SPA; and
- Snape Warren SSSI – designated for its floodplain fen, lowland dry acid grassland and lowland dry heath. Located 2 km south of the proposed Suffolk Onshore Scheme draft Order Limits.

2.3.8.3 The Haven, Aldeburgh Local Nature Reserve lies on the coast 569 m east of the closest surface construction works (the landfall and associated construction compound). RSPB North Warren Reserve is located adjacent to the landfall and associated construction compound. It supports a wide range of breeding and non-breeding birds as well as other wildlife.

2.3.8.4 There are 17 non-statutory County Wildlife Sites (CWS) or roadside nature reserves within 2 km of the proposed Suffolk Onshore Scheme draft Order Limits. These do not have specific citations or designated features but are Roadside Nature Reserve (RNR) 216, Tiggins Lane RNR, Lonely Wood CWS, Benhall Churchyard CWS, Manor Farm Meadows CWS, Aldeburgh Golf Course CWS, Grove Wood CWS, Knodishall Common CWS, Buckles Wood CWS, Kelsale Morio Meadow CWS, Benhall Green Meadows CWS, Church Common CWS, Disused Railway Line (Aldringham – Aldeburgh) CWS, Suffolk Shingle Beaches CWS, Knodishall Whin CWS, Aldeburgh Old Allotments CWS, and Great Wood CWS. Great Wood CWS, Grove Wood CWS, and Disused Railway Line CWS are the closest of these to the and are located adjacent to the proposed Suffolk Onshore Scheme.

2.3.8.5 The SPAs, SACs and Ramsar sites are all of **international** importance**.** The SSSI is of **national** importance**,** while the county wildlife sites are of **regional** importance**.**

Habitats

2.3.8.6 Please see **Figure 2.3.2 Phase 1 Habitat Survey** for locations of habitats discussed in this chapter. The majority of the proposed Suffolk Onshore Scheme, west of Aldeburgh golf course, consists of arable crops. Crops recorded as being present included barley (*Hordeum vulgare*). Fields of amenity grassland grown for turf were also present within and adjacent to the proposed Suffolk Onshore Scheme.

2.3.8.7 There are multiple small woodland blocks across the survey area, the majority of which are outside of the Suffolk Onshore Scheme draft Order Limits. This includes Grove Wood, which is directly adjacent to the Suffolk Onshore Scheme draft Order Limits. Woodlands include a mix of including oak (*Quercus robur*), ash (*Fraxinus excelsior*), field maple (*Acer campestre*), sycamore (*Acer pseudoplatanus*), horse chestnut (*Aesculus hippocastanum*), wych elm (*Ulmus glabra*), hazel (*Corylus avellana*) and lime (*Tilia x europaea*) with a ground flora dominated by bracken (*Pteridium aquilinum*). There are also areas of mixed woodland with a similar canopy composition but including Scot's pine (*Pinus sylvestris*). There are also numerous areas of oak, silver birch, willow and field maple plantation woodland, and large areas of coniferous plantation.

2.3.8.8 Numerous scattered mature broadleaved and coniferous trees are present within the survey area including within the proposed Suffolk Onshore Scheme, including field maple, dog rose, oak, lime, turkey oak (*Quercus cerris*), sycamore, beech (*Fagus sylvatica*), cherry (*Prunus* sp.) and Corsican pine (*Pinus nigra subsp. Laricio*). There are areas of neutral grassland across the survey area within the Suffolk Onshore Scheme, particularly in field margins. Most of these contain typical species assemblages of species-poor unmanaged neutral grassland, but one area has better species diversity including pyramidal orchids (*Anacamptis pyramidalis*) and southern marsh orchids (*Dactylorhiza pratermissa*).

2.3.8.9 There are large areas of semi-improved acid grassland in the east of the proposed Suffolk Onshore Scheme along the coastline and west to the Aldeburgh golf course. These habitats were found over the sandier soils present in this area. Areas of semi-improved acid grassland included land north of Aldeburgh golf course, land south of Sandlings SPA and land within the North Warren RSPB Reserve and SSSI. See **Figure 2.3.2 Phase 1 Habitat Survey**. Species found within these areas are typical of acid grassland including common bent, early hair-grass (*Aira praecox*), sweet vernal-grass (*Anthoxanthum odoratum*), sheep's sorrel (*Rumex acetosella*), broom (C*ytisus scoparius*), bastard toadflax (*Rapistrum rugosum*), sand sedge (*Carex arenaria*), as well as some small stands of dense common gorse scrub (*Ulex europaeus*).

2.3.8.10 Areas of the North Warren RSPB Reserve/Leiston-Aldeburgh SSSI were recorded as marsh/marshy grassland and swamp and include extensive reedbeds. A small area of ephemeral/short perennial was located within the east of the North Warren RSPB reserve/SSSI bordering the road. The ephemeral/short perennial habitat contained a large area of mossy stonecrop (*Crassula tilleae*) which is a national scarce plant. Various important coastal/shingle vegetation communities including dune heath, coastal grassland and strandline shingle were present along the beach at the eastern extent of the proposed Suffolk Onshore Scheme.

2.3.8.11 Multiple intact and defunct hedgerows are recorded within the proposed Suffolk Onshore Scheme, although only one (in land parcel 421) was recorded as being species-rich. The River Fromus runs north-south through land parcel 468 in the west of the proposed Suffolk Onshore Scheme. A small section (<100 m) of the Hundred River is present within the proposed Suffolk Onshore Scheme and is located adjacent to the boundary of land parcel 28. Other small flowing wet ditches may be present within and immediately adjacent to the proposed Suffolk Onshore Scheme draft Order Limits.

2.3.8.12 Himalayan balsam (*Impatiens glandulifera*) was recorded along the River Fromus. This is a WCA Schedule 9 invasive species and measures will be introduced to eradicate it, or at least prevent its spread.

2.3.8.13 Great Wood ancient woodland and the Rivers Fromus and Hundred River are considered of **national** importance**,** the broad-leaved woodland, hedgerows, acid grassland, dune heath, coastal grassland and strandline shingle are considered of **regional** importance given their status as S41 habitats of principal importance and Suffolk priority habitats**.** The short ephemeral vegetation within the RSPB reserve is also considered of **regional** importance due to the areas of mossy stonecrop (*Crassula tillaea*)**.** The plantation woodland, neutral grassland and ditches on site are accorded **local** importance**.**

Ornithology

2.3.8.14 For the purposes of this summary, which will be expanded on considerably for the DCO ES, ornithological interest has been broadly divided into two distinct parcels reflecting two very different broad habitat groupings. The first of these is the RSPB North Warren Reserve including the beach. The second of these is the remainder of the route to the west of the RSPB North Warren Reserve. This part of the survey area is dominated by arable farmland but also includes Aldeburgh golf-course and associated land and other habitats such as plantation woodland and horse paddocks.

RSPB North Warren Reserve

2.3.8.15 RSPB North Warren Reserve is a nationally important site for wintering waterfowl, with hundreds of wintering ducks in particular. Thousands of non-breeding wigeon and teal, as well as shelduck, black-tailed godwit (*Limosa limosa*), herring gull, gadwall, and shoveler have been recorded on the RSPB North Warren Reserve beneath which the trenchless cabling technique will occur. The site is also a regular wintering site for Russian white-fronted geese. The reserve also supports breeding and wintering shorebirds including lapwing (*Vanellus vanellus*) and common snipe (*Gallinago gallinago*). During spring surveys both in 2022 and 2023 bittern were observed on feeding flights and fishing within the proposed Suffolk Onshore Scheme. Also close to the proposed Suffolk Onshore Scheme draft Order Limits, breeding hobby and nightjar (both WCA Schedule 1 species protected from disturbance while nesting) have been recorded. Cetti's warbler (*Cettia cetti*; WCA Schedule 1) is also common in reedy/scrubby areas.

Farmland and other habitats west of the RSPB North Warren reserve

2.3.8.16 The farmland and other habitats west of the RSPB North Warren Reserve are of relatively low importance for birds, although there are some locations that attract notable concentrations of species of principal importance. During winter 2022 there were three locations that supported the following wintering shorebirds: Eurasian curlew, lapwing and golden plover (*Pluvialis apricaria*). One area just east of Saxmundham held regular flocks of lapwing and golden plover. Two other locations held concentrations of Eurasian curlew and lapwing. Smaller groups were occasionally recorded elsewhere. Other than the above, wintering birds were generally typical of inland farmland with occasional concentrations of finches and other wintering birds primarily dictated by the vagaries of crop rotation. Where bird concentrations were found it was generally due to the location of game cover strips, that might vary annually. Herring gull and shelduck (both species for which Alde-Ore Estuary SPA is designated) have been recorded on the farmland within the proposed Suffolk Onshore Scheme during wintering bird surveys.

2.3.8.17 Breeding birds on the route were typical of lowland farmland, with expected species such as skylark (*Alauda arvensis*) and yellowhammer (*Emberiza citrinella*). Atypical species included several pairs of woodlark located on rough pasture/abandoned paddocks bordered on arable fields and holding territory on field edges where sandy soils predominated, approximately 350m from the proposed Suffolk Onshore Scheme draft Order Limits. Aldeburgh golf course also held this species, where a nest was located. Several nightingales (*Luscinia megarhynchos*) were also recorded at various locations along the route, mostly on Aldeburgh golf course which is beyond the proposed Suffolk Onshore Scheme. Also of note along the route was the presence of a hobby nest on a field boundary within proposed Suffolk Onshore Scheme.

2.3.8.18 Although bird surveys are ongoing, it is clear that the bird assemblage at Suffolk is of **regional** importance, rising to **national** importance for RSPB North Warren Reserve and for some species, such as nightjar and woodlark**.**

Other Faunal Species

2.3.8.19 As discussed earlier in this chapter, great crested newt surveys are not being undertaken as Natural England has agreed that the District Level Licensing Scheme for Suffolk can be used for this project.

2.3.8.20 Surveys for all other faunal species are either in their early stages or have not yet commenced. However, the areas of greatest value for most animal species will be areas of rough grassland, field margins, hedgerows, ponds and blocks of woodland. In contrast, large open arable fields, or closely grazed pasture will be of commensurately lower value. There are several dozen hedgerows and/or woodland areas within the proposed Suffolk Onshore Scheme draft Order Limits that are likely to need to be traversed. There are others which lie parallel to the likely cable corridor and haul route and are within the draft Order Limits but which could be preserved without impact.

2.3.8.21 These hedgerows and treelines may support populations of badger, foraging and potentially roosting bats and dormice. There are also some areas of woodland, acid grassland or rough grassland/field margins which could support populations of reptiles or uncommon invertebrates. However, at this stage, with many surveys ongoing or still to be undertaken, it is not possible to provide a value to the survey area for faunal groups other than birds.

Future Baseline

2.3.8.22 Relative to the current baseline, the value of ecological features present are not expected to change significantly by the end of the construction or decommissioning period in 2031. Management of the habitats is unlikely to change over this period, and consequently no significant degradation or improvement of habitat condition is expected. Due to development pressure year on year within the wider landscape, protected and notable species and habitats are likely to remain priorities for conservation within future baseline scenarios.

2.3.9 Mitigation

2.3.9.1 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**, mitigation measures typically fall into one of the three categories: embedded measures; control and management measures; and mitigation measures.

Embedded Measures

2.3.9.2 Embedded measures have been integral in reducing the ecology and biodiversity effects of the Proposed Project. Measures that that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works. This includes avoidance of Great Wood CWS and ancient woodland. In practice, the construction or decommissioning areas for the Proposed Project will avoid land take from the woodland and will avoid excavations or compaction within the tree canopy;
- Commitments made within **Volume 2, Part 1, Appendix 1.4.F, Schedule of Environmental Commitment and Mitigation Measures**.

Control and Management Measures

2.3.9.3 The following measures have been included within **Volume 2, Part 1, Appendix 1.4.A, Outline Code of Construction Practice** relevant to the control and management of impacts that could affect ecology and biodiversity receptors:

- GG03 - A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP) and a Construction Traffic Management Plan (CTMP) will be produced prior to construction or decommissioning.
- GG04 - The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction or decommissioning. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans. The name and contact details of person(s) accountable for issues relating to dust, waste, water, noise, vibration and soil will be displayed at site boundary.
- GG06 - Construction or decommissioning workers will undergo training to increase their awareness of environmental issues as applicable to their role on the project. Topics will include but not be limited to: pollution prevention and pollution incident response; dust management and control measures; location and protection of sensitive environmental sites and features.

- GG08 - Land used temporarily will be reinstated where practicable to its pre-construction condition and use, unless agreed otherwise. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, with landowner consultation.
- GG09 - Where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.
- GG15 - Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15m from watercourses, ponds and groundwater dependent terrestrial ecosystems.
- GG16 - Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).
- GG22 - Construction or decommissioning lighting will be of the lowest levels necessary to safely perform each task. It will be designed, positioned and directed to reduce the intrusion into adjacent properties, protected species and habitats.
- W05 - The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard to volumes and discharge rates and will include discharges to land, water bodies or third-party drains/sewers.
- GH02 - Construction methods such as appropriate piling techniques (if required) to minimise the risk of mixing of aquifer bodies through the creation of new. This includes the provision of a Foundation Works Risk Assessment (FWRA), which would be undertaken once the proposed foundation solutions are known, in accordance with EA guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination'.
- GH07 - Any temporary dewatering activities during construction will be undertaken in accordance with EA guidance, and if required, an Abstraction Licence and Environmental Permit (for the discharge) and will be limited to the depth and time required to facilitate construction activities.
- LV03 - A five-year aftercare period will be established for all reinstatement and mitigation planting.
- LV04 - Separation and storage of subsoil and topsoil to ensure no degradation in quality and reinstatement undertaken as soon as possible after completion of construction or decommissioning of each section/area of works.
- LV05 - Temporary and separate placement of topsoil and subsoil will be stored adjacent to the trench with the additional height of the subsoil storage used on whichever side requires greater screening benefit, where practicable.

- B01 - The contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the Environmental Statement and through pre-construction or decommissioning surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.
- B02 - The assumption will be that vegetation with the potential to support breeding birds will not be removed during the breeding bird season (March to August inclusive). If any works become necessary during the breeding bird season, works will be supervised by an Environmental Clerk of Works. Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the Environmental Clerk of Works (ECoW).
- B03 - Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.
- B04 - To control the spread of invasive weeds in accordance with the WCA, any plant or machinery that has been used in areas infested with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles will be controlled to prevent the spread of the plant (through seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading.
- B05 - All habitats suitable for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150 mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an ECoW. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction or decommissioning works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction or decommissioning where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided.
- B06 – Where necessary, alternative roost structures (bat boxes) will be provided (with landowner consent) on retained trees within the draft Order Limits or areas outside of the draft Order Limits where agreed with relevant landowners. Three boxes will be provided for each tree with moderate bat roost potential to be felled. Five boxes will be provided for each tree with high bat roost potential to be felled.
- B07 - Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, ‘dead hedging’ should be used, where practicable, in the interim periods to retain connectivity during construction or decommissioning. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.

Mitigation Measures

2.3.9.4 Mitigation measures are additional topic and site-specific measures that have been applied to mitigate or offset any likely significant effects. Mitigation measures included that are relevant to ecology and biodiversity receptors are included in **Volume 2, Part 1, Appendix 1.4.F, Schedule of Environmental Commitment and Mitigation Measures**, and are:

- Where sections of hedgerow are removed, and are ecologically worth preserving, they should be removed in sections retaining intact root balls where possible. This will speed up the restoration process.
- Where ditches and watercourses are identified as environmentally sensitive the crossing technology, design, installation and decommissioning works will be assessed to mitigate the potential impacts of the works. Mitigation could be through the reduction in width of the construction swathe, the inclusion of ecology mitigation factors within the design such as mammal passes, the use of trenchless crossing techniques and/or the introduction of staged clearance and construction works.
- Where it is necessary to cross watercourses using open cut methods, removal of riparian vegetation and damage to the banks will be kept to the minimum required, will not obstruct the passage of wildlife, and will be restored on cessation of works.
- Ensure the construction swathe is located beyond the tree canopy and root protection zones of Great Wood CWS and Grove Wood CWS.
- Where feasible and necessary, the most potentially disturbing elements of the trenchless installation will take place between September and February, to minimise disturbance of breeding nightjar and woodlark in the adjacent Sandlings SPA.
- Install visual and noise disturbance mitigation (e.g. close-board fencing) along the boundary between the construction or decommissioning compound and trenchless techniques location west of the North Warren RSPB Reserve, and both the Reserve and Sandlings SPA, should noise modelling indicate this is necessary.
- Implement similar noise and visual disturbance screening measures elsewhere on the construction or decommissioning site if feasible and identified as being necessary to protect specific features e.g., bat roosts, badger setts, or otter holts.
- Implement measures to ensure no significant hydrological impact on water levels in North Warren RSPB Reserve.
- Investigate feasibility of maintaining continuous cropping of arable land within the LoD, and allowing acid grassland to grow tall within the LoD, prior to and during construction to discourage woodlark from nesting close enough to the construction or decommissioning to be disturbed, until works in that area are complete.

- Consider undertaking potentially disturbing (noisy) maintenance activities during August and September, where practicable, reducing risk of disturbance of breeding or non-breeding birds using RSPB North Warren Reserve or breeding nightjar and woodlark using Sandlings SPA. Where areas of acid grassland are to be trenched, and where space allows, explore cutting the best quality grassland as turves and storing them to one side in order that they can be restored after trenching is complete.
- Plant permanent new woodland and hedgerows, to achieve biodiversity net gain but also to compensate for the temporary removal of plantation, woodland and hedgerow sections for cable installation and the haul route. Areas to be confirmed once surveys complete.
- Create other habitat of long-term value to fauna, particularly farmland birds, as far as practicably possible, such as through securing permanent wide grassed field margins and crop regimes favourable to farmland birds and creating areas of species-rich structurally diverse grassland, to compensate for the permanent loss of farmland habitat due to the proposed Saxmundham Converter station, and the temporary loss required for cable installation and the haul route. Areas and details to be confirmed once surveys are complete.
- Where practicable, permanent bridges constructed over the River Fromus, would be designed to achieve a height:width ration of 0.7. . Using this height:width ratio, the soffit of a 4m wide bridge would need to be 2.8m above the water level to allow sufficient light to penetrate.

2.3.10 Preliminary Assessment of Effects

2.3.10.1 The preliminary assessment of the effects of the Suffolk Onshore Scheme described in this section considers the embedded, control and management and mitigation measures described in Section 2.3.7.

2.3.10.2 The preliminary ecology and biodiversity assessment of the effects of the Suffolk Onshore Scheme is presented in the following tables.

2.3.10.3 Table 2.3.13 presents the preliminary assessment of direct loss of habitats during construction or decommissioning.

Table 2.3.13: Preliminary assessment of direct loss of habitats during construction or decommissioning

	Preliminary assessment
Receptor	Habitats within the Suffolk Onshore Scheme Boundary
Potential Impact	Direct loss (temporary or permanent) of habitats
Proposed Project phase	Construction or decommissioning. While habitat loss for the Proposed Project Saxmundham Converter station and Friston Substation will be permanent, it will only occur during the construction or decommissioning phases.
Duration	Most habitat loss will last for the duration of construction or decommissioning, which depending on location could

	Preliminary assessment
	take up to five years. Most temporary habitat losses will be from arable land that can be restored following completion of construction or decommissioning in that section. Field margins in this landscape are generally narrow and botanically species poor. Loss of ruderal vegetation or hedgerow gaps can be restored within 1-2 years of cessation of works. Losses for the footprint of the Saxmundham Converter Station and Friston Substation, and associated access track, will be permanent.
Mitigation	GG08, LV03, LV04, LV05, B07 Plant permanent new woodland and hedgerows, to achieve biodiversity net gain but also to compensate for the temporary removal of plantation, woodland and hedgerow sections for cable installation and the haul route. Areas to be confirmed once surveys complete. Create other habitat of long-term value to fauna, particularly farmland birds, as far as practicably possible, such as through securing wide grassed field margins and crop regimes favourable to farmland birds and creating areas of species-rich structurally diverse grassland, to compensate for the permanent loss of farmland habitat due to the proposed converter station, and the temporary loss required for cable installation and the haul route. Areas and details to be confirmed once surveys complete.
Proposed Project	
Preliminary sensitivity	National importance for Great Wood ancient woodland. Regional importance for the broad-leaved woodland, hedgerows and acid grassland on site. District importance for the plantation woodland, neutral grassland and ditches on site.
Preliminary magnitude	Moderate adverse <u>Temporary loss</u> Most temporary land take would be from arable fields, pasture, or amenity grassland of negligible intrinsic value. Approximately 11 ha of acid grassland will be lost temporarily to facilitate the Proposed Project. Approximately twenty-one hedgerows will also be temporarily punctured for construction or decommissioning access to create a typical gap 40 m wide. This totals approximately 880 m of hedgerow being temporarily removed.

	Preliminary assessment
	There will also need to be at least three ditch or stream crossings. This will involve the loss of at least 500 m^2 of tall ruderal bankside vegetation. Great Wood ancient woodland (the closest area of ancient woodland to the Proposed Project, which is also a CWS) lies adjacent to the Suffolk Onshore Boundary. However, the Suffolk Onshore Boundary has been defined to provide maximum flexibility for routing and locating decisions to be refined. In practice, the construction or decommissioning areas for the Proposed Project will avoid land take from the woodland and will avoid excavations or compaction within the tree canopy. Permanent loss Habitat loss due to the Proposed Project Saxmundham Converter Station and Friston Substation will be permanent. Most of this is arable land of negligible intrinsic value. Approximately 170 m of poor hedgerow would be lost to accommodate the Friston Substation and an equivalent length of ditch. Some loss for the cable corridor will also be effectively permanent as it is not appropriate to replant trees over a cable. This would result in the loss of 0.9ha of woodland (mostly along Leiston Road) and 0.5ha of conifer plantation. The location and extent of permanent access is complex and various potential routes exist at this stage due to the potential for co-location. In some instances, a greater extent of habitat would be lost than in others, and in two cases a new crossing of the River Fromus would be required. Actual extent of habitat loss will be refined for the ES but in broad terms approximately 900 m^2 of plantation would be removed to create the permanent access to the Proposed Saxmundham Converter Station, along with 200 m^2 of broadleaved woodland. There would also be a varying amount of hedgerow loss depending on the final route option chosen. The remainder of habitat lost would be species-poor neutral grassland.
Preliminary likely significance of effect	Significant, for broadleaved and mixed woodland, acid grassland and hedgerows until the details of the mitigation identified above are developed. Not significant for plantation, arable land, pasture and amenity grassland.
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High
Proposed Project with co-location	

	Preliminary assessment
Preliminary sensitivity	As for the Proposed Project without co-location scenario
Preliminary magnitude	As for the Proposed Project without co-location scenario, although extents will be greater. <u>Temporary landtake</u> Approximately twenty-one hedgerows will also be temporarily punctured for construction or decommissioning access to create a typical gap 69 m wide in a co-location scenario. This totals approximately 1.5 km of hedgerow being temporarily removed. There will also need to be at least three ditch or stream crossings which will involve the loss of up to 900 m^2 of ruderal bankside vegetation with co-location. <u>Permanent landtake</u> Habitat loss due to the Proposed Project Saxmundham Converter Station and other projects converter stations and Friston Substation will be permanent. Most of this is arable land of negligible intrinsic value. Approximately, a further 278 m of poor hedgerow, in addition to the 170m already considered under the Proposed Project alone, would be permanently lost to accommodate the Friston Substation and one of the converter stations. The location and extent of permanent access is complex and various potential routes exist at this stage due to the potential for co-location. In some instances, a greater extent of habitat would be lost than in others, and in two cases a new crossing of the River Fromus would be required. Actual extent of habitat loss will be refined for the ES but in broad terms approximately 900 m^2 of conifer plantation would be removed to create the permanent access to the Proposed Project Saxmundham Converter Station, site along with 200 m^2 of broadleaved woodland. There would also be a varying amount of hedgerow loss depending on the final route option chosen. The remainder of habitat lost would be species-poor neutral grassland.
Preliminary likely significance of effect	As for the Proposed Project without co-location scenario
Sensitivity Test	As for the Proposed Project without co-location scenario
Confidence in prediction	As for the Proposed Project without co-location scenario

2.3.10.4 Table 2.3.14 provides the preliminary assessment of direct loss of designated sites during construction or decommissioning.

Table 2.3.14: Preliminary assessment of direct loss of designated sites during construction or decommissioning

	Preliminary assessment
Receptor	Designated sites
Potential Impact	Direct loss of designated sites during construction or decommissioning
Proposed Project phase	Construction or decommissioning
Duration	Construction or decommissioning period is up to five years
Mitigation	GG06, GG09
Proposed Project	
Preliminary sensitivity	Sandlings SPA is of international sensitivity, Leiston-Aldeburgh SSSI is of national sensitivity and Great Wood CWS, Grove Wood CWS, Disused Railway Line (Aldringham – Aldeburgh) CWS and RSPB North Warren Reserve are all of regional sensitivity.
Preliminary magnitude	Negligible adverse No direct loss of any designated sites will arise as a result of the Proposed Project. While several coastal designated sites and RSPB North Warren Reserve do technically lie within the Suffolk Onshore Boundary these will all be traversed using trenchless techniques. Unit 13 of Leiston-Aldeburgh SSSI, which is also part of Sandlings SPA, lies adjacent to the Suffolk Onshore Boundary, where there will be both a construction compound and a trenchless techniques launch location. However, there will be no land take within the SSSI/SPA boundary. The Disused Railway Line (Aldringham – Aldeburgh) CWS lies within the Suffolk Onshore Boundary but is east of the trenchless techniques launch location and therefore will be traversed entirely with trenchless techniques. Great Wood and Grove Wood County Wildlife Sites lie adjacent to the Suffolk Onshore Boundary. However, the Suffolk Onshore Boundary has been defined to provide maximum flexibility for routing and locating decisions to be refined. In practice, the construction or decommissioning areas for the Proposed Project will avoid land take from both woodlands and will avoid excavations or compaction within the tree canopy.
Preliminary likely significance of effect	Not Significant

	Preliminary assessment
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location scenario
Preliminary magnitude	As for the Proposed Project without co-location scenario
Preliminary likely significance of effect	As for the Proposed Project without co-location scenario
Sensitivity Test	As for the Proposed Project without co-location scenario
Confidence in prediction	As for the Proposed Project without co-location scenario

2.3.10.5 Table 2.3.15 provides the preliminary assessment of direct loss of bird habitat during construction or decommissioning, including functionally-linked habitat for Sandlings SPA, Alde-Ore Estuary SPA and Minsmere-Walberswick SPA.

Table 2.3.15: Preliminary assessment of direct loss of bird habitat during construction or decommissioning, including functionally-linked habitat for Sandlings SPA, Alde-Ore Estuary SPA and Minsmere-Walberswick SPA.

	Preliminary assessment
Receptor	Ornithology
Potential Impact	Direct loss of bird habitat during construction or decommissioning, including functionally-linked habitat
Proposed Project phase	Construction or decommissioning. While habitat loss for the Proposed Project Saxmundham Converter Station and Friston Substation will be permanent, it will occur during the construction or decommissioning phases.
Duration	Most habitat loss will last for the duration of construction or decommissioning, which depending on location could take up to five years. Most temporary habitat losses will be from arable land that can be restored immediately following completion of construction or decommissioning in that section. Field margins in this landscape are generally narrow and botanically species poor. Loss of ruderal vegetation or hedgerow gaps can be restored within 1-2 years of cessation of works. Losses for the footprint of the converter station and substation, and associated access track, will be permanent.
Mitigation	GG08, LV03, LV04, LV05, B07

	Preliminary assessment
	Where sections of hedgerow are removed, and are ecologically worth preserving, they should be removed in sections retaining intact root balls where possible. This will speed up the restoration process. Where ditches and watercourses are identified as environmentally sensitive the crossing technology, design, installation and decommissioning works will be assessed to mitigate the potential impacts of the works. Mitigation could be through the reduction in width of the construction swathe, the inclusion of ecology mitigation factors within the design such as mammal passes, the use of trenchless crossing techniques and/or the introduction of staged clearance and construction works. Where it is necessary to cross watercourses using open cut methods, removal of riparian vegetation and damage to the banks will be kept to the minimum required, will not obstruct the passage of wildlife, and will be restored on cessation of works. Where areas of acid grassland are to be trenched, and where space allows, explore cutting the best quality grassland as turves and storing them to one side in order that they can be restored after trenching is complete.. Plant permanent new woodland and hedgerows, to achieve biodiversity net gain but also to compensate for the temporary removal of plantation, woodland and hedgerow sections for cable installation and the haul route. Areas to be confirmed once surveys complete. Create other habitat of long-term value to fauna, particularly farmland birds, as far as practicably possible, such as through securing permanent wide grassed field margins and crop regimes favourable to farmland birds and creating areas of species-rich structurally diverse grassland, to compensate for the permanent loss of farmland habitat due to the proposed converter station, and the temporary loss required for cable installation and the haul route. Areas and details to be confirmed once surveys complete.
Proposed Project	
Preliminary sensitivity	The affected area is of at least regional importance for breeding and non-breeding birds, rising to national importance for woodlark.
Preliminary magnitude	The impact is considered to be minor adverse, as the amount of habitat to be lost both permanently and temporarily is small relative to the total amount of habitat within the Suffolk Onshore Boundary and wider landscape. For birds, unpublished guidance from Natural England (Ref. 2.3.44) indicates that wintering waders and waterfowl forage up to 2 km from the boundary of the SSSIs for

which they are designated. The exceptions are white-fronted goose, greylag goose, Bewick's swan, whooper swan, Bean goose, golden plover, lapwing, pink-footed goose and barnacle goose, which can forage up to 10-20 km (depending on species). For heathland breeding birds such as nightjar and woodlark a 2 km impact risk zone around the SSSI boundary is identified for 'pylons and overhead cables'.

Special Protection Areas

Sandlings SPA is designated for nightjar and woodlark. These species nest primarily within the SPA, although in 2023 three nesting pairs of woodlark were recorded nesting within 200 m of one of the construction access routes (an existing track) connecting the Suffolk Onshore Boundary with Leiston Road. Several pairs were also recorded on Aldeburgh Golf Club, the closest of which was nesting approximately 100 m from the Suffolk Onshore Boundary. A further pair was recorded nesting in the northern part of the Proposed Project (between Friston and Knodishall) adjacent to the Suffolk Onshore Boundary. According to the aforementioned Natural England guidance both woodlark and nightjar could forage up to 2 km from their nests. Both woodlarks and nightjars have relatively broad foraging habitat requirements; in addition to heathland and early stage plantation they will also forage in grazed grass heath, arable land and have been recorded foraging in deciduous woodland and rough pasture, as well as domestic gardens. As such there is no shortage of suitable foraging habitat for both species within 2 km of the SPA or other nest locations. While there will be temporary loss of up to approximately 116 ha of potentially suitable foraging habitat within 2 km of the SPA, this represents a maximum 0.6% of available foraging habitat within 2 km of the SPA, and the vast majority will be restored within 2-3 years (as the entire route will not be excavated at once). There will be no permanent loss within 2 km of the SPA except for a few square metres occupied by some link kiosks. It is therefore concluded that no likely significant effect on Sandlings SPA due to loss of functionally-linked habitat will occur.

Thousands of non-breeding wigeon and teal, as well as shelduck, black-tailed godwit, herring gull, gadwall, and shoveler have been recorded on the RSPB North Warren Reserve beneath where trenchless techniques will be used, and some of these have also been recorded on farmland within the Suffolk Onshore Boundary during wintering bird surveys. Until the second season of wintering bird surveys are complete it is not possible to determine whether the Suffolk Onshore Boundary supports more than 1% of the Alde-Ore Estuary SPA population of

	Preliminary assessment
	these species. Therefore, the land within the Suffolk Onshore Boundary could constitute functionally-linked land for the Alde-Orde Estuary SPA/Ramsar site which is less than 1 km from the Proposed Project. Most habitat loss in this area would be temporary but some (under the Friston Substation and Proposed Saxmundham Converter Station) would be permanent. Of the species identified in Natural England guidance (Ref 2.3.4.4) as making significant use of land more than 2 km from designated site boundaries none are reasons for designation of Alde-Ore Estuary SPA and one, non-breeding white-fronted goose, is a reason for designation of Minsmere-Walberswick SPA. The relevant marshland parts of the SPA are located 5.6 km north of the Proposed Project. White-fronted goose can utilise habitat for roosting and foraging up to 10 km from the boundaries of the sites for which it is designated. Until wintering bird surveys are complete it is therefore not possible to dismiss likely significant effects due to loss of functionally-linked habitat associated with Alde-Ore Estuary SPA/Ramsar and Minsmere-Walberswick SPA. This impact pathway is therefore screened in for Appropriate Assessment, see **Volume 1, Part 5, Chapter 1, Habitat Regulations Screening Report**. <u>Other ornithology</u> The fields through which the cable route will pass supports a typical farmland breeding bird assemblage, as well as non-breeding birds that are probably linked to the nearby RSPB North Warren Reserve. The temporary loss of arable land and 0.9 ha of woodland, 0.5 ha of plantation and 800 m of hedgerow will reduce nesting and foraging opportunities for the duration of construction. Most of this habitat will be replanted within five years of removal. The loss of 8 ha of arable habitat and 170 m of hedgerow within which the Proposed Project Saxmundham Converter Station and Friston Substation will be located will reduce feeding and resting opportunities for these species, although being more than 5 km from North Warren RSPB Reserve the permanent loss is unlikely to have a significant effect on that site.
Preliminary likely significance of effect	Significant, until the details of the mitigation identified above are developed.
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High

	Preliminary assessment
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for without co-location, except the extents are greater: approximately 1.5 km of hedgerow to be temporarily removed and 20 ha of arable land and 500 m of hedgerow to be lost permanently.
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.6 Table 2.3.16 presents the preliminary assessment of direct habitat loss on other fauna.

Table 2.3.16: Preliminary assessment of direct habitat loss on other fauna

	Preliminary assessment
Receptor	Other fauna (reptiles, bats, riparian mammals, dormice, invertebrates, fish)
Potential Impact	Direct habitat loss on other fauna
Proposed Project phase	Construction or decommissioning. While habitat loss for the converter station and substation will be permanent, it will occur during the construction or decommissioning phases.
Duration	Most habitat loss will last for the duration of construction or decommissioning, which depending on location could take up to five years. Most temporary habitat losses will be from arable land that can be restored immediately following completion of construction or decommissioning in that section. Field margins in this landscape are generally narrow and botanically species poor. Loss of ruderal vegetation or hedgerow gaps can be restored within 1-2 years of cessation of works, as can restoration of watercourses. Losses for the footprint of the converter station and substation, and associated access track, will be permanent.
Mitigation	GG08, LV03, LV04, LV05, B07 Where sections of hedgerow are removed, and are ecologically worth preserving, they should be removed in sections retaining intact root balls where possible. This will speed up the restoration process.

	Preliminary assessment
	Where ditches and watercourses are identified as environmentally sensitive the crossing technology, design, installation and decommissioning works will be assessed to mitigate the potential impacts of the works. Mitigation could be through the reduction in width of the construction swathe, the inclusion of ecology mitigation factors within the design such as mammal passes, the use of trenchless crossing techniques and/or the introduction of staged clearance and construction works. Where it is necessary to cross watercourses using open cut methods, removal of riparian vegetation and damage to the banks will be kept to the minimum required, will not obstruct the passage of wildlife, and will be restored on cessation of works. Where areas of acid grassland are to be trenched, and where space allows, explore cutting the best quality grassland as turves and storing them to one side in order that they can be restored after trenching is complete. Plant permanent new woodland and hedgerows, to achieve biodiversity net gain but also to compensate for the temporary removal of plantation, woodland and hedgerow sections for cable installation and the haul route. Areas to be confirmed once surveys complete. Create other habitat of long-term value to fauna, particularly farmland birds, as far as practicably possible, such as through securing permanent wide grassed field margins and crop regimes favourable to farmland birds and creating areas of species-rich structurally diverse grassland, to compensate for the permanent loss of farmland habitat due to the proposed converter station, and the temporary loss required for cable installation and the haul route. Areas and details to be confirmed once surveys complete.
Preliminary sensitivity	Not possible to state at this stage
Proposed Project without Co-location	
Preliminary magnitude	Not possible to state at this stage. Until surveys are complete, it is not currently possible to identify the importance of the habitat within the survey area for other faunal groups. However, the temporary removal of approximately 0.9 ha of woodland, 0.5 ha of plantation, 500 m^2 of tall ruderal, and 800 m of hedgerow will have an impact on available habitat, although most such habitat in the survey area will be retained and most habitat that is lost will be replanted within five years of removal. A total of 170 m of hedgerow will be permanently lost. This may

	Preliminary assessment
	affect foraging and habitat opportunities for bats and dormice depending on the use of those features. Depending on how the cable crossings of watercourses are undertaken there could also be intermediate term reversible impacts on habitat for riparian mammals, fish and invertebrates for up to two years after the cables are installed.
Preliminary likely significance of effect	Not possible to state at this stage. Details of further surveys proposed in 2024 are detailed in Table 2.3.6, and will enable this to be assessed.
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	Low
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for without co-location, except the extents are greater: approximately 1.5km of hedgerow to be temporarily removed and approximately 20ha of arable land and approximately 500m of hedgerow to be lost permanently.
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.7 Table 2.3.17 presents the preliminary assessment of disturbance of designated sites during construction or decommissioning.

Table 2.3.17: Preliminary assessment of disturbance of designated sites during construction or decommissioning

	Preliminary assessment
Receptor	Designated sites
Potential Impact	Disturbance of designated sites during construction or decommissioning
Proposed Project phase	Construction or decommissioning
Duration	The Proposed Project Saxmundham Converter Station is likely to take up to four years from site preparation to commencement of restoration
Mitigation	GG03, GG04, GG06, GG09, GG21 Where feasible and necessary, the most potentially disturbing elements of the trenchless installation will

	Preliminary assessment
	take place between September and February, to minimise disturbance of breeding nightjar and woodlark in the adjacent Sandlings SPA. Install visual and noise disturbance mitigation (e.g. close-board fencing) along the boundary between the construction or decommissioning compound and trenchless techniques location west of the North Warren RSPB Reserve, and both the Reserve and Sandlings SPA, should noise modelling for the DCO indicate this is necessary; Investigate feasibility of continuous cropping of arable land, and allowing acid grassland to grow tall within the Limits of Deviation prior to and during construction to discourage woodlark from nesting close enough to the construction or decommissioning to be disturbed, until works in that area are complete; Ensure the construction swathe is located beyond the tree canopy and root protection zone of Great Wood CWS and Grove Wood CWS.
Preliminary sensitivity	International for Sandlings SPA, national for Leiston-Aldeburgh SSSI, regional for Disused Railway Line (Aldringham – Aldeburgh) CWS, Great Wood CWS and Grove Wood CWS.
Proposed Project without Co-location	
Preliminary magnitude	Minor adverse, with mitigation in place Professional experience is that in broad terms noise impacts from conventional construction techniques are unlikely to arise from noise-generating activities located more than approximately 250 m from the qualifying bird species, and possibly less depending on the activity. <u>Internationally important sites</u> The launch pit immediately abuts Sandlings SPA to the north, at its closest point. Overlapping with the trenchless techniques launch location there will also be construction compound immediately south of Sandlings SPA. Construction taking place adjacent to Sandlings SPA will include sections of cable trenching, the trenchless techniques launch location, and a construction compound. Sandlings SPA is designated for its nesting nightjar and woodlark. These species are either absent (nightjar) or non-breeding (woodlark) during the period September to February inclusive. Works within 250 m of the SPA boundary that can be scheduled to take place between September and February inclusive would therefore not result in disturbance of nesting nightjar or woodlark. There will be no disturbance of any other internationally important wildlife sites during construction or

	Preliminary assessment
	decommissioning as the next closest site (Outer Thames Estuary SPA) is 860 m from the Proposed Project at its closest. Nationally important sites Leiston-Aldeburgh SSSI is in the same location as Sandlings SPA and will therefore be similarly affected. Locally important sites Disused Railway Line (Aldringham – Aldeburgh) County Wildlife Site lies within the Suffolk Onshore Boundary, immediately east of the trenchless techniques launch pit. Great Wood County Wildlife Site and Grove Wood CWS lie adjacent to the Suffolk Onshore Boundary. However, neither are specifically designated for specific features that are highly disturbance sensitive. As a result significant disturbance of these sites is not expected.
Preliminary likely significance of effect	Significant, until the details of the mitigation identified above are developed.
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for the Proposed Project without co-location
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.8 Table 2.3.18 presents the preliminary assessment of disturbance of birds and other fauna during construction or decommissioning.

Table 2.3.18: Preliminary assessment of disturbance of birds and other fauna during construction or decommissioning

	Preliminary assessment
Receptor	Ornithology and other fauna
Potential Impact	Disturbance of birds and other fauna during construction or decommissioning
Proposed Project phase	Construction or decommissioning
Duration	Up to five years
Mitigation	GG03, GG04, GG06, GG09, GG21

	Preliminary assessment
	Install visual and noise disturbance mitigation (e.g. close-board fencing) along the boundary between the construction or decommissioning compound and trenchless techniques location west of the North Warren RSPB Reserve, and both the Reserve and Sandlings SPA, should noise modelling for the DCO indicate this is necessary; Implement similar noise and visual disturbance screening measures elsewhere on the construction or decommissioning site if feasible and identified as being necessary to protect specific features e.g. bat roosts, badger setts, or otter holts. Investigate feasibility of maintaining continuous cropping of arable land within the LoD, and allowing acid grassland to grow tall within the LoD, prior to and during construction to discourage woodlark from nesting close enough to the construction or decommissioning to be disturbed, until works in that area are complete.
Preliminary sensitivity	At least district importance for ornithology. Not currently possible to confirm for other fauna.
Proposed Project without Co-location	
Preliminary magnitude	Minor adverse, with mitigation Birds and other fauna using the site are likely to be sensitive to noise and visual disturbance during construction or decommissioning. The most sensitive features are likely to be the field boundaries (hedgerows and ditches) and the SPA, RSPB Reserve and SSSI already referenced. Disturbance is likely to arise throughout the construction or decommissioning period. Even with mitigation it will not be possible to avoid disturbance in some parts of the site. Several territories of woodlark have been recorded within 200 m of the Suffolk Onshore Boundary, including away from the SPA. This is a WCA Schedule 1 species. This protection not only makes it illegal to kill or injure the bird or damage eggs or nests (as with all birds), but also makes it illegal to disturb the species while they are nesting.
Preliminary likely significance of effect	**Not Significant**
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.

	Preliminary assessment
Confidence in prediction	High. While some bird species and other mobile fauna will be displaced to other locations during some of the construction or decommissioning period, this will be a temporary impact and will be minimised by the mitigation measures proposed, which will specifically target the most sensitive areas such as the SSSI. This is an active farmed landscape and agricultural machinery is common. With the exception of the SSSI the survey area does not contain features likely to be of particularly high importance for sensitive wildlife.
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for the Proposed Project without co-location
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.9 Table 2.3.19 presents the preliminary assessment of air quality impacts on designated sites during construction or decommissioning.

Table 2.3.19: Preliminary assessment of air quality impacts on designated sites during construction or decommissioning

	Preliminary assessment
Receptor	Statutory designated sites
Potential Impact	Air quality impacts on designated sites
Proposed Project phase	Construction or decommissioning
Duration	Up to five years
Mitigation	GG03, GG04
Preliminary sensitivity	National
Proposed Project without Co-location	
Preliminary magnitude	Minor adverse The potential sources of atmospheric pollution during construction or decommissioning are from dust, and from construction or decommissioning traffic exhaust emissions of oxides of nitrogen[4], which can lead to nitrogen deposition.

[4] Petrol vehicle exhausts also emit ammonia but most construction or decommissioning vehicles use diesel

	Preliminary assessment
	IAQM guidance (Ref. 2.3.15) indicates that dust can significantly affect ecological receptors up to 50m from the source, by coating vegetation and blocking photosynthesis. Sandlings SPA/Leiston-Aldeburgh SSSI/RSPB North Warren Reserve is the most sensitive features with regard to dust and will lie within 50m of construction or decommissioning activities or the haul route. The Design Manual for Roads and Bridges Volume LA105 (Ref. 2.3.19) indicates exhaust emission impacts on designated sites should be considered in ecological impact assessments. Guidance from IAQM (Ref. 2.3.16) and Natural England (Ref. 2.3.20) identifies that traffic exhaust emissions can affect designated ecological sites within 200 m of the source. Sandlings SPA/Leiston-Aldeburgh SSSI is the most sensitive designated site within 200 m of construction or decommissioning traffic movements. Approximately 12 ha of Sandlings SPA and 30 ha of Leiston-Aldeburgh SSSI will be located within 200 m of a construction compound, the haul road, and the trenchless techniques launch location, as these will directly about the southern boundary of the SPA and southern & western boundary of the SSSI. This amounts to 0.3% of the 3,406 ha SPA and 5.6% of the 535 ha SSSI. According to the UK Air Pollution Information System (www.apis.ac.uk) nitrogen deposition to acid grassland and heathland can affect the value of those habitats for both nightjar and woodlark and can also affect the woodland, reedbed and other habitats within the SSSI. This is primarily due to changes in habitat structure and botanical composition.
Preliminary likely significance of effect	Significant for Sandlings SPA/Leiston-Aldeburgh SSSI until assessment complete. Not significant for other sites.
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	Medium
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for the Proposed Project without co-location
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.10 Table 2.3.20 presents the preliminary assessment of spillages on habitats during construction or decommissioning.

Table 2.3.20: Preliminary assessment of spillages and introduction of non-native species on habitats during construction or decommissioning

	Preliminary assessment
Receptor	Habitats, particularly RSPB North Warren Reserve, Leiston-Aldeburgh SSSI, Sandlings SPA and other ditches within the Kent Onshore Boundary.
Potential Impact	Spillages and introduction of non-native species of habitats
Proposed Project phase	Construction or decommissioning
Duration	Up to five years
Mitigation	GG03, GG04, GG06, GG09, GG15, GG16, B04
Preliminary sensitivity	RSPB North Warren Reserve, Leiston-Aldeburgh SSSI and Sandlings SPA are the most sensitive receptors that could be affected by pollution or introduction of non-native species if they occurred. These sites are respectively of regional, national and international importance.
Proposed Project	
Preliminary magnitude	If it occurred the magnitude of impact would be at least moderate adverse, but with mitigation the magnitude would be minor adverse to negligible as spillages and introduction of non-native species would not occur. Spillages of fuel, lubricant, oil, drilling fluid and other chemicals could result in negative impacts on all habitats within the Suffolk Onshore Boundary, particularly aquatic habitats and watercourses where they can quickly spread. This can result in direct toxicity and deoxygenation. Non-native species including, but not limited to, Japanese knotweed and giant hogweed can be introduced to and spread on sites by construction or decommissioning plant. Giant hogweed *Heracleum mantegazzianum* and three-cornered garlic *Allium triquetrum*, have desk-study records in the broad area while Himalayan balsam *Impatiens glandulifera* has been recorded during surveys within the Suffolk Onshore Boundary. The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016 (Ref. 2.3.45 and Ref. 2.3.46) make it an offence to pollute watercourses. Therefore, during construction or decommissioning, National Grid has a duty of care to the water environment and produce and implement plans and

	Preliminary assessment
	procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. It also has a duty to prevent the spread of invasive species due to its activities.
Preliminary likely significance of effect	**Not Significant**
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.10.11 Table 2.3.21 presents the preliminary assessment of killing and injury of fauna during construction or decommissioning.

Table 2.3.21: Preliminary assessment of killing and injury of fauna during construction or decommissioning.

	Preliminary assessment
Receptor	Ornithology and other fauna
Potential Impact	Killing and injury of fauna
Proposed Project phase	Construction or decommissioning
Duration	Up to five years
Mitigation	GG03, GG06, GG09, B01, B02, B03, B05
Preliminary sensitivity	The Suffolk Onshore Boundary (excluding the intertidal zone which will not be affected due to the works being accomplished through trenchless techniques) is considered to be of at least regional importance for birds. Value for other fauna is currently uncertain as surveys ongoing.
Proposed Project	
Preliminary magnitude	Major adverse, if it occurred, negligible with mitigation in place Surveys are ongoing but the Suffolk Onshore Boundary is known to hold populations of nesting birds, and may hold populations of roosting bats, dormice, badger,

	Preliminary assessment
	reptiles or riparian mammals. All of these are vulnerable to killing or injury without appropriate care being taken.
Preliminary likely significance of effect	Not Significant, with mitigation
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for the Proposed Project without co-location
Preliminary magnitude	As for the Proposed Project without co-location
Preliminary likely significance of effect	As for the Proposed Project without co-location
Sensitivity Test	As for the Proposed Project without co-location
Confidence in prediction	As for the Proposed Project without co-location

2.3.10.12 Table 2.3.22 presents the preliminary assessment of hydrological impacts on designated sites during construction or decommissioning.

Table 2.3.22: Preliminary assessment of hydrological impacts on designated sites during construction or decommissioning

	Preliminary assessment
Receptor	RSPB North Warren Reserve and Leiston-Aldeburgh SSSI, both of which partly depend on a high water table
Potential Impact	Hydrological impacts on designated sites
Proposed Project phase	Construction or decommissioning
Duration	In the location east of Leiston Road, sub-surface works could take up to three years.
Mitigation	GG03, GG04, GH07, W05, GH02
Preliminary sensitivity	National importance.
Proposed Project without Co-location	
Preliminary magnitude	If it occurred the magnitude of impact would be at least moderate adverse, but with mitigation the magnitude would be minor adverse to negligible as effects on water levels would not occur. During trenchless techniques or trenching works east of Leiston Road there is the potential for trench and trenchless techniques launch pit dewatering, or the trenchless techniques themselves, to affect water levels within the SSSI and RSPB Reserve.

	Preliminary assessment
Preliminary likely significance of effect	Not Significant
Sensitivity Test	Changes in the construction years or periods will not affect the significance assessment.
Confidence in prediction	Medium
Proposed Project with co-location	
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.10.13 Table 2.3.23 presents the preliminary assessment of disturbance of designated sites during operation.

Table 2.3.23: Preliminary assessment of disturbance of designated sites during operation

	Preliminary assessment
Receptor	Designated sites
Potential Impact	Disturbance of designated sites during operation.
Proposed Project phase	Operation
Duration	Temporary, whenever maintenance visits occur
Mitigation	GG03, GG04, GG06, GG09, GG21 Consider undertaking potentially disturbing (noisy) maintenance activities during August and September, where practicable, reducing risk of disturbance of breeding or non-breeding birds using RSPB North Warren Reserve or breeding nightjar and woodlark using Sandlings SPA.
Preliminary sensitivity	International for Sandlings SPA, national for Leiston-Aldeburgh SSSI, regional for RSPB North Warren Reserve, Great Wood CWS, Grove Wood CWS and Disused Railway Line (Aldringham – Aldeburgh) CWS.
Proposed Project without Co-location	
Preliminary magnitude	Negligible with mitigation in place Internationally important sites

	Preliminary assessment
	Sandlings SPA is immediately adjacent to the Suffolk Onshore Boundary. However, once works are completed the construction compound and trenchless techniques pit will be removed/restored. Four ducts would be installed as part of the trenchless techniques during the construction or decommissioning period, which includes one spare duct. Should a section of cable need to be replaced at the landfall, this spare duct would allow for a new section of cable to be pulled through rather than a repair to the existing or needing to re install ducts. This would avoid the need to excavate sections of trenchless techniques. Nationally important sites Leiston-Aldeburgh SSSI is in the same location as Sandlings SPA and will therefore be similarly affected without mitigation. Locally important sites Disused Railway Line (Aldringham – Aldeburgh) County Wildlife Site lies within the Suffolk Onshore Boundary, immediately east of the trenchless techniques launch pit. Great Wood County Wildlife Site and Grove Wood CWS lie adjacent to the Suffolk Onshore Boundary. However, neither are specifically designated for specific features that are highly disturbance sensitive. As a result significant disturbance of this site is not expected. Once the Proposed Project is operational there will be no requirement for day-to-day presence of people, and the infrastructure does not produce sounds that would result in disturbance of birds. The only potential for disturbance would therefore be during maintenance. It is impossible to forecast exactly when maintenance crews may need to visit parts of the site, or how often. However, maintenance visits are likely to be infrequent and for short periods and will be much smaller in scale than construction or decommissioning. Given the area is an active agricultural landscape, with tractors, agricultural workers and other mobile plant present as a matter of course, and both Sandlings SPA and RSPB North Warren Reserve have recreational visitors and public paths, it is considered that maintenance crews and activities would generally not constitute a material change to this background level of activity. Nonetheless, some precautionary mitigation has been identified.
Preliminary likely significance of effect	**Not significant** once mitigation in place

	Preliminary assessment
Sensitivity Test	Changes in the construction years or periods will not affect the operational assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.10.14 Table 2.3.24 presents the preliminary assessment of disturbance of birds and other fauna during operation.

Table 2.3.24: Preliminary assessment of disturbance of birds and other fauna during operation

	Preliminary assessment
Receptor	Birds and other fauna
Potential Impact	Disturbance of birds and other fauna during operation
Proposed Project phase	Operation
Duration	Temporary, whenever maintenance visits occur
Mitigation	GG03, GG04, GG06, GG09, GG21
Preliminary sensitivity	At least district importance for ornithology. Not currently possible to confirm for other fauna.
Proposed Project without Co-location	
Preliminary magnitude	Minor adverse without mitigation given the scale and intensity of any activity will be far smaller and more localised during operation than it would be during construction or decommissioning. Negligible with mitigation, given the brief nature of any maintenance visits and activities. During operation there may be the need for periodic maintenance visits. Birds and other fauna using the site are likely to be sensitive to noise and visual disturbance. The most sensitive features are likely to be the field boundaries (hedgerows and ditches) and the RSPB Reserve, SPA and SSSI already referenced.

	Preliminary assessment
	Once the Proposed Project is operational there will be no requirement for day-to-day presence of people, and the infrastructure does not produce sounds that would result in disturbance of birds. The only potential for disturbance would therefore be during maintenance. It is impossible to forecast exactly when maintenance crews may need to visit parts of the site, or how often. However, maintenance visits are likely to be infrequent and for short periods and will be much smaller in scale than construction or decommissioning. Given the area is an active agricultural landscape, with tractors, agricultural workers and other mobile plant present as a matter of course, it is considered that maintenance crews and activities would not constitute a material change to this background level of activity.
Preliminary likely significance of effect	**Not Significant**
Sensitivity Test	Changes in the construction years or periods will not affect the operational assessment.
Confidence in prediction	High
Proposed Project with co-location	
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.10.15 Table 2.3.25 presents the preliminary assessment of spillages and introduction of invasive species on habitats during operation.

Table 2.3.25: Preliminary assessment of spillages on habitats and introduction of invasive species during operation

	Preliminary assessment
Receptor	Habitats, particularly RSPB North Warren Reserve, Leiston-Aldeburgh SSSI, Sandlings SPA and other ditches within the Kent Onshore Boundary.
Potential Impact	Spillages on habitats and introduction of invasive species during operation
Proposed Project phase	Operation
Duration	Temporary, whenever maintenance visits occur

	Preliminary assessment
Mitigation	National Grid Business Procedures ETBP040 for Protection of the Water Environment and ETBP046 for management of Invasive species.
Preliminary sensitivity	RSPB North Warren Reserve, Leiston-Aldeburgh SSSI and Sandlings SPA are the most sensitive receptors that could be affected by pollution or introduction of non-native species if they occurred. These sites are respectively of regional, national and international importance.
Proposed Project without Co-location	
Preliminary magnitude	If it occurred the magnitude of impact would be at least moderate adverse, but with mitigation the magnitude would be minor adverse to negligible as spillages and introduction of non-native species would not occur. Spillages of fuel, lubricant, oil, drilling fluid and other chemicals could result in negative impacts on all habitats within the Kent Onshore Boundary, particularly aquatic habitats and watercourses where they can quickly spread. This can result in direct toxicity and deoxygenation. Non-native species including, but not limited to, Japanese knotweed and giant hogweed can be introduced to and spread on sites by construction or decommissioning plant. Site survey indicates that giant Hogweed *Heracleum mantegazzianum* and three-cornered garlic *Allium triquetrum*, have desk-study records in the broad area while Himalayan balsam has been recorded within the Suffolk Onshore Boundary. The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016 (Ref. 2.3.45and Ref. 2.3.46) make it an offence to pollute watercourses. Therefore, during maintenance, National Grid has a duty of care to the water environment and produce and implement plans and procedures to prevent discharge from works entering surface, groundwater, wetlands or coastal waters. It also has a duty to prevent the spread of invasive species due to its activities.
Preliminary likely significance of effect	Not Significant
Sensitivity Test	Changes in the construction years or periods will not affect the operational assessment.
Confidence in prediction	High
Proposed Project with co-location	

	Preliminary assessment
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.10.16 Table 3.3.26 presents the preliminary assessment of shading on riparian habitats during operation.

Table 3.3.26: Preliminary assessment of shading impacts on riparian habitats during operation

	Preliminary assessment
Receptor	River Frome
Potential Impact	Shading impacts on riparian habitats during operation
Proposed Project phase	Operation
Duration	Permanent
Mitigation	Where practicable, permanent bridges constructed over the River Fromus, would be designed to achieve a height:width ration of 0.7. Using this height:width ratio, the soffit of a 4m wide bridge would need to be 2.8m above the water level to allow sufficient light to penetrate.
Preliminary sensitivity	River Fromus is of regional importance.
Proposed Project without Co-location	
Preliminary magnitude	If significant shading occurred for a long enough duration, the magnitude of impact would be up to moderate adverse, but with mitigation the magnitude would be minor adverse to negligible. Two of the permanent access options would involve a permanent crossing of the River Fromus to enable access to the converter station, which could have shading impacts. Shading due to bridges and viaducts is related particularly to the soffit (i.e., the underside of the piers) height of the bridge, the width of the bridge and the orientation of the bridge. If shading was sufficient in scale and duration to cause loss of vegetation, this could result in soil erosion from denuded banks during periods of high flow, which could then lead to water quality effects downstream by siltation.

	Preliminary assessment
	Few studies have considered the shading effects of bridges on vegetation. The only relevant one identified in this HRA process was a study conducted in North Carolina, in which Broome et al. (Ref. 2.3.29) reported a correlation between the ratio of bridge height (H) and bridge width (W) and effects of shading on saltmarsh habitat at seven permanent bridges 3 m-15 m high. They found that bridges with height to width (H:W) ratios less than 0.5 affected marsh productivity and function under the bridges. At H:W ratios between 0.5 and 0.68, bridge effects were detected but were greatly diminished. Above H:W ratios of 0.70 the effects from shading by bridges were no longer measurable. Broome et al. (2005) therefore concluded that shading by bridges with H:W ratios >0.7 do not adversely impact the productivity or function of the underlying marsh. There do not appear to be any similar studies of shading by bridges carried out for terrestrial or aquatic habitats in England or other parts of Europe prior a study undertaken in 2017 to inform the application for a development consent for the A303 bypass on behalf of National Highways (Ref. 2.3.47). That study sampled 31 permanent single-deck bridges and three twin-deck bridges in southern England. A variety of measurements were taken from these bridges, including their width, height, aspect, vegetation cover and the light levels beneath the bridge relative to an unshaded control. Sketches and qualitative observations were also made. Analysis of these data was undertaken to determine any significant relationships between the variables, and any effect of the bridge's height-width (H:W) ratio and aspect on vegetation beneath. The study concluded that there is an increased likelihood of significant adverse effects on vegetation if the height to width ratio of the permanent structure is 0.6 or less. Therefore, the minimum recommended height-width ratio for a permanent bridge was considered to be in the range of 0.6 to 0.8. The narrower the deck the less important it is that the bridge sits high above the bank top to avoid significant shading.
Preliminary likely significance of effect	**Not Significant**
Sensitivity Test	Changes in the construction years or periods will not affect the operational assessment.
Confidence in prediction	High

Preliminary assessment	
Proposed Project with co-location	
Preliminary sensitivity	As for without co-location
Preliminary magnitude	As for without co-location.
Preliminary likely significance of effect	As for without co-location
Sensitivity Test	As for without co-location
Confidence in prediction	As for without co-location

2.3.11 Summary

2.3.11.1 Survey work is ongoing or has yet to commence for most receptors. However, the first season of non-breeding bird survey and breeding bird survey has been completed and Phase 1 Habitat Survey has been undertaken (**Volume 2, Part 2, Appendix 2.3.A, Phase 1 Habitat Report**). Desk study has also been completed. In general, the habitats present within the Suffolk Onshore Area are common and widespread, with the exception of an area of broadleaved woodland and extensive areas of acid grassland. Although acid grassland is generally species poor it is a regionally important habitat. These habitats will be lost temporarily (approximately five years) and their loss will require offsetting. This could be accomplished through planting permanent new woodland and hedgerows and turning arable land to acid grassland where appropriate.

2.3.11.2 There is also an SPA (Sandlings SPA), SSSI (Leiston-Aldeburgh SSSI), RSPB Reserve (North Warren) and an area of ancient woodland (Great Wood CWS) immediately adjacent to the Suffolk Onshore Scheme Boundary. These vary in geographical value from regional to international. Hedgerows in the landscape are generally poorly developed and species-poor, and field margins are narrow and contain common and widespread grasses. Himalayan balsam is a WCA Schedule 9 invasive species and measures will be introduced to eradicate it, or at least prevent its spread.

2.3.11.3 Leiston-Aldeburgh SSSI and RSPB North Warren RSPB Reserve lie within the Suffolk Onshore Boundary but will be traversed by trenchless techniques. These sites (and Sandlings SPA) could be affected by noise and visual disturbance during construction or decommissioning given the trenchless techniques pit and a construction compound (as well as the cable corridor) lie adjacent to these sites. Mitigation is identified to control noise and visual disturbance, including avoiding disturbing works where possible during the nesting season in the vicinity of Sandlings SPA. Outside the SPA, several woodlark territories have been identified close to the Proposed Project. Similar measures to avoid disturbance will therefore be required to comply with the Wildlife & Countryside Act.

2.3.11.4 Air quality impacts during construction on Sandlings SPA and Leiston-Aldeburgh SSSI will require further consideration for the DCO ES as will hydrological effects on the SSSI and North Warren RSPB Reserve. It is likely that the Suffolk Onshore Boundary constitutes functionally-linked habitat for Sandlings SPA, RSPB North Warren Reserve and possible Alde-Ore Estuary SPA/Ramsar site and Minsmere-Walberswick SPA/Ramsar site. This habitat will only be lost temporarily (approximately 5 years) but will require offsetting. This could be done through converting arable land to acid grassland, securing permanent wide grassed field margins and crop regimes favourable to farmland birds, and creating areas of species-rich structurally diverse grassland, to compensate. Enhancements are also being considered to comply with Biodiversity Net Gain requirements, which will be reported for the ES which will accompany the DCO application.

2.3.11.5 Standard pollution control and invasive species control measures will ensure no significant effect occurs through those pathways. Impacts on other fauna are still being investigated.

2.3.11.6 Impacts on other fauna are still being investigated.

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National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com