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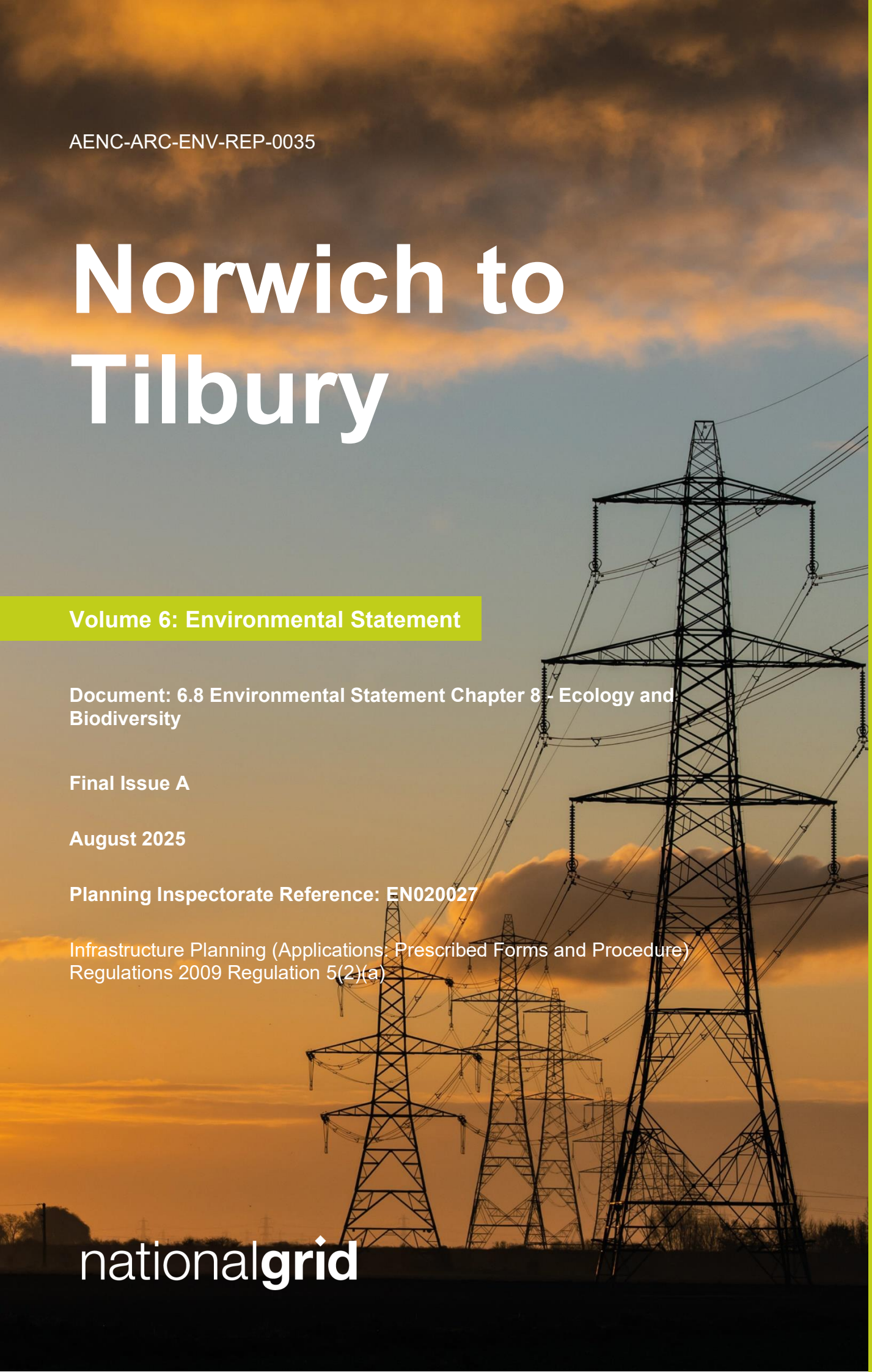

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8. Ecology and Biodiversity

8.1 Introduction

8.1.1 This chapter of the Environmental Statement (ES) (Volume 6 of the Development Consent Order (DCO) application) details the assessment of the potential residual effects of the Norwich to Tilbury project (the '*Project*') on Ecology and Biodiversity. This chapter covers effects on the following ecological and biodiversity receptors:

- International sites designated for biodiversity:
  - Thames Estuary and Marshes Ramsar Site and Special Protection Area (SPA) (during construction and operation (and maintenance))
  - Stour and Orwell Estuaries Ramsar Site and SPA (during construction and operation (and maintenance))
  - Norfolk Valley Fens Special Area of Conservation (SAC) (during construction)
- 19 national sites designated for biodiversity during construction
- National sites designated for biodiversity during operation (and maintenance):
  - Mucking Flats and Marshes Site of Special Scientific Interest (SSSI)
  - South Thames Estuary and Marshes SSSI
  - National sites which underlie the European sites (listed above)
- Local (13 statutory and 370 non-statutory) sites designated for biodiversity during construction
- Protected/notable[1] habitats and species during construction:
  - Ancient woodland
  - Habitat of Principal Importance (HPI) in England
  - '*Important*' hedgerows
  - Vascular and non-vascular plants and fungi
  - Fish, terrestrial invertebrates, reptiles, breeding birds, wintering/passage birds, badger, bats, hazel dormouse, otter, water vole, white-clawed crayfish, amphibians and other species listed under s41 of the Natural Environment and Rural Communities Act 2006
- Wintering/passage birds, bats and other species listed under s41 of the Natural Environment and Rural Communities Act 2006 during operation (and maintenance)

[1] Notable species are species of conservation concern as listed under s41 of the Natural Environment and Rural Communities Act 2006, Notable bird species are birds listed under s41 of the Natural Environment and Rural Communities Act 2006, under Schedule 1 of the Wildlife and Countryside Act 1981, as amended and those listed as red or amber in the Birds of Conservation Concern 5 (Stanbury *et al*., 2021).

- Groundwater Dependent Terrestrial Ecosystems (GWDTE) during construction and operation (and maintenance)
- Invasive Non-Native Species (INNS) during construction and operation (and maintenance)
- Other notable mammals (brown hare, hedgehog, and harvest mouse) during construction and operation (and maintenance).

8.1.2 Since the production of the scoping report the UK Government has allowed for the licensed reintroduction of free-living beavers into the wild, this is different from the unlicensed releases that have occurred in various part of the UK. There are no recorded locations of free-living beavers in East Anglia and so beaver has not been included in this chapter.

8.1.3 There are interrelationships related to the likely residual effects on Ecology and Biodiversity and other environmental topics. Therefore, please also refer to the following chapters:

- Chapter 6: Agriculture and Soils (document reference 6.6)
- Chapter 7: Air Quality (document reference 6.7)
- Chapter 9: Contaminated Land, Geology and Hydrogeology (document reference 6.9)
- Chapter 12: Hydrology, Land Drainage and Flood Risk (document reference 6.12)
- Chapter 13: Landscape and Visual (particularly in relation to arboricultural features (e.g. Tree Preservation Orders and veteran trees) which are not considered in this chapter) (document reference 6.13)
- Chapter 14: Noise and Vibration (document reference 6.14)
- Chapter 16: Traffic and Transport (document reference 6.16).

8.1.4 This chapter is supported by the following appendices:

- Appendix 8.1: Habitat Report (document reference 6.8.A1)
- Appendix 8.2: National Vegetation Classification Report (document reference 6.8.A2)
- Appendix 8.3: Hedgerows Regulations Report (document reference 6.8.A3)
- Appendix 8.4: Aquatic Report (document reference 6.8.A4)
- Appendix 8.5: Terrestrial Invertebrate Report (document reference 6.8.A5)
- Appendix 8.6: Reptile Report (document reference 6.8.A6)
- Appendix 8.7: Breeding Bird Report (document reference 6.8.A7)
- Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)
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- Appendix 8.14: Species of Principal Importance Report (document reference 6.8.A14)
- Appendix 8.15: Badger Report (document reference 6.8.A15)
- Appendix 8.16: Designated Sites (document reference 6.8.A16).

8.1.5 Figures that support this chapter are provided within the appendices listed above.

8.1.6 Common species names have been referred to throughout this chapter. However, the scientific names are used within the associated technical appendices listed above.

8.1.7 This chapter has also been drafted in parallel with the following DCO documents:

- Habitats Regulations Assessment (HRA) (document reference 5.3)
- Biodiversity Net Gain (BNG) Report (document reference 7.1)
- Outline Landscape and Ecological Management Plan (LEMP) (document reference 7.4) – including an Ancient Woodland and Veteran Tree Strategy.

8.2 Regulatory and Planning Policy Context

National Policy Statement (NPS)

8.2.1 Chapter 2: Key Legislation and Planning Policy Context (document reference 6.2) sets out the key overarching policy relevant to the Project. Overarching National Policy Statement for Energy (EN-1) (National Policy Statement EN-1) (Department for Energy Security and Net Zero (DESNZ), 2024a) is the key overarching policy relevant to the Project. This is supported by National Policy Statement for Electricity Networks Infrastructure (EN-5) (National Policy Statement EN-5) (DESNZ, 2024b).

8.2.2 Full consideration of the relevant NPSs for the Project can be found in the Policy Compliance Document (document reference 5.7).

Overarching NPS for Energy (EN-1)

8.2.3 NPS EN-1 (DESNZ, 2024) contains the following paragraphs relating to Ecology and Biodiversity which has been considered within this chapter.

8.2.4 Section 4.6 (Environmental and Biodiversity Net Gain) of NPS EN-1 outlines the consideration for environmental and Biodiversity Net Gain within energy projects. Paragraph 4.6.2 states that '*Projects in England should consider and seek to incorporate improvements in natural capital, ecosystem services and the benefits they deliver when planning how to deliver biodiversity net gain*'.

8.2.5 Paragraph 4.6.6 states energy Nationally Significant Infrastructure Project (NSIP) proposals should *'…. seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, and the wider environment where possible'* with Paragraph 4.6.7 advising that applicants *'…. are encouraged to use the latest version of the biodiversity metric [2] to calculate their biodiversity baseline*

[2] Currently the Statutory Biodiversity Metric (Defra (2024).

and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application'.

8.2.6 Paragraph 4.6.8 states that where possible, biodiversity metric calculation data *'…should be shared, alongside a completed biodiversity metric calculation, with the Local Authority and Natural England for discussion at the pre-application stage'*.

8.2.7 Paragraph 4.6.11 states that *'We encourage details of any off-site delivery of biodiversity net gain to be set out within the application for development consent'*.

8.2.8 Paragraph 4.6.12 further advises that *'When delivering biodiversity net gain off-site, developments should do this in a manner that best contributes to the achievement of relevant wider strategic outcomes, for example by increasing habitat connectivity, enhancing other ecosystem service outcomes, or considering use of green infrastructure strategies. Reference should be made to relevant national or local plans and strategies, to inform off-site biodiversity net gain delivery. If published, the relevant strategy is the Local Nature Recovery Strategy (LNRS). If an LNRS has not been published, the relevant consenting body or planning authority my specify alternative plans, policies or strategies to use'*.

8.2.9 Paragraph 4.6.13 states that *'In addition to delivering biodiversity net gain, developments may also deliver wider environmental gains and benefits to communities relevant to the local area, and to national policy priorities such as…the enhancement, expansion or provision of trees and woodlands.*'

8.2.10 Paragraph 4.6.15 states that *'Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design (including any relevant operational aspects) of the project'*.

8.2.11 Paragraph 4.6.1 [numbering out of sync in NPS] states that *'Although achieving biodiversity net gain is not currently an obligation on applicants[3], Schedule 15 of the Environment Act 2021 contains provisions which, when commenced, mean the Secretary of State may not grant an application for a Development Consent Order unless satisfied that a biodiversity gain objective is met…'*. Paragraph 4.6.2 of EN-1 states that *'The biodiversity gain objective will be set out in a biodiversity gain statement (as defined under the Environment Act 2021)'*.

8.2.12 Although not a statutory requirement for DCO projects submitted to the Planning Inspectorate prior to May 2026, National Grid has committed to deliver 10% BNG with wider environmental and societal benefits on all construction projects requiring formal planning or consent, including Norwich to Tilbury. The BNG assessment (based on the statutory biodiversity metric) is presented in the Biodiversity Net Gain Report (document reference 7.1).

8.2.13 In relation to SSSIs, Paragraph 5.4.8 states that *'Development on land within or outside a SSSI, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits (including need) of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national networks of SSSIs'*.

[3] At the time of writing, BNG is not anticipated to be mandatory for NSIPs until May 2026

8.2.14 Paragraph 5.4.17 states *that 'Where the development is subject to EIA [Environmental Impact Assessment] the applicant should ensure the ES [Environmental Statement] clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance,…on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats'*.

8.2.15 Paragraph 5.4.19 states that *'The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests'*, while Paragraph 5.4.20 states that *'Applicants should consider wider ecosystem services and benefits of natural capital when designing enhancement measures'*.

8.2.16 Paragraphs 5.4.20 – 5.4.34 advise on measures and action to be taken during design (e.g. consideration of wider ecosystem services within enhancement measures and consideration of effects on mobile/migratory species) and providing appropriate information to allow the Secretary of State to determine whether a HRA is required and/or conduct an Appropriate Assessment. This advice has been considered during the Project design.

8.2.17 Paragraph 5.4.35 details measures and actions that should be demonstrated as part of the application e.g. timing construction to avoid/limit disturbance and restoring habitats (where practicable) after construction. The Project has addressed these measures within the design and/or the Outline Code of Construction Practice (CoCP) (document reference 7.2) together with the Outline LEMP (document reference 7.4).

8.2.18 Paragraph 5.4.36 states that *'Applicants should produce a Biodiversity Management Strategy as part of their development proposals'.* An Outline LEMP (document reference 7.4) and Biodiversity Net Gain Report (document reference 7.1) has been produced to support the application.

8.2.19 Paragraph 5.4.42 states that *'...development should, in line with the mitigation hierarchy, aim to avoid significant harm to biodiversity and geological conservation interest, including through consideration of reasonable alternatives…Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought.'*

8.2.20 Paragraph 5.4.44 states that *'Any habitat creation or enhancement delivered including linkages with existing habitats for compensation or biodiversity net gain should generally be maintained for a minimum period of 30 years, or for the lifetime of the project, if longer'*. National Grid have committed to delivering 10% BNG with wider environmental and societal benefits. The 30 years management and maintenance is applicable to all Environmental Areas and any offsite BNG.

8.2.21 Paragraph 5.4.53 states that *'The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of any irreplaceable habitats, including ancient woodland, and ancient and veteran trees unless there are wholly exceptional reasons[4] and a suitable compensation strategy exists'*. An Ancient Woodland and Veteran Tree Strategy (Appendix B of the Outline LEMP (document reference 7.4)) has been prepared to support the application for development consent.

[4] *For example where the public benefits (including need) of the nationally significant energy infrastructure would clearly outweigh the loss or deterioration of the habitat.*

8.2.22 Paragraph 5.4.55 states that *'The Secretary of State should refuse consent where harm to a protected species and relevant habitat would result, unless there is an overriding public interest and the other relevant legal tests are met'*. Where required, a derogation licence and/or SSSI assent issued by Natural England would be sought to ensure legal and policy compliance.

8.2.23 The Project has considered opportunities to enhance ecosystem services and natural capital within the design following the mitigation hierarchy to avoid and minimise effects to ecology and biodiversity receptors. Where effects to ecology and biodiversity receptors would be unavoidable, the design incorporates appropriate mitigation and/or compensation measures. The Project assesses effects on ecology and biodiversity receptors within the ES (Volume 6 of the DCO application) and includes justification of any residual effects.

NPS for Electricity Networks Infrastructure (EN-5)

8.2.24 Section 2.9 (Applicant assessment), Paragraph 2.9.3 states that *'Electricity networks infrastructure pose a particular potential risk to birdlife including large birds, such as swans and geese, and perching birds'*, and Paragraph 2.9.4 advises that *'Applicants should consider measures to make lines more visible such as bird flappers and diverters'*.

8.2.25 Paragraph 2.9.6 states that *'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'*.

8.2.26 Paragraphs 2.10.2 to 2.10.4 state that:

8.2.27 *'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'*.

8.2.28 *'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'*.

8.2.29 *'Electrocution risks can be reduced through the design of lattice steel tower crossarms, insulators and the construction 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'*.

Other National Legislation and Policy

8.2.30 Although the Project will be considered against National Policy stated above, the assessment has also been undertaken in accordance with, and with reference to, the following national legislation and policy:

- The Conservation of Habitats and Species Regulations 2017, as amended in 2019 (Habitats Regulations)
- Wildlife and Countryside Act 1981, as amended (WCA)
- Natural Environment and Rural Communities (NERC) Act 2006
- Countryside and Rights of Way Act 2000

- The Hedgerows Regulations 1997
- The Invasive Alien Species (Enforcement and Permitting) Order 2019 (Invasive Species Order)
- Environment Act 2021
- National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2024 (with a further amendment to correct a footnote error in February 2025)), and accompanying planning practice guidance on the natural environment (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities, 2024)
- Keepers of Time: ancient and native woodland and trees policy in England (Department for Environment, Food and Rural Affairs (Defra), 2022).

Regional and Local Policy

8.2.31 Chapter 2: Key Legislation and Planning Policy Context (document reference 6.2), the Planning Statement (document reference 5.6) and Policy Compliance Document (document reference 5.7) set out relevant regional and local policy.

8.2.32 Key regional and local policy relevant to Ecology and Biodiversity, that has informed the assessment within this ES (Volume 6 of the DCO application), comprises:

- Suffolk's Nature Strategy (Suffolk County Council, 2015)
- Stowmarket Area Action Plan (Mid Suffolk District Council, 2013)
- Essex Green Infrastructure Strategy (Essex County Council, 2020)
- Colchester City Council's Biodiversity Supplementary Planning Document (Colchester City Council, 2023)
- Dedham Vale National Landscape (an Area of Outstanding Natural Beauty (AONB)) and Stour Valley Project Area Management Plan 2021 – 2026 (Dedham Vale National Landscape and Stour Valley Project Area Partnership, 2021)
- Greater Norwich Local Plan (Broadland District Council, South Norfolk Council Norwich City Council and Norfolk County Council, adopted 2024)
- South Norfolk Council Development Management Policies Document (South Norfolk Council, adopted 2015)
- Joint Core Strategy for Broadland, Norwich, and South Norfolk (Broadland District Council / South Norfolk Council, adopted March 2011, amendments January 2014)
- Babergh and Mid Suffolk Joint Local Plan – Part 1 (Babergh District Council / Mid Suffolk District Council, November 2023)
- North Essex Authorities' Shared Strategic Section 1 Plan (adopted 2021) (Tendring, Colchester and Braintree)
- Tendring District Local Plan 2013-2033 and Beyond, Section 2 (Tendring District Council, adopted January 2022)
- Colchester City Local Plan 2017-2033 Section 2 (Colchester City Council, adopted July 2022)

- The Braintree District Local Plan 2013 – 2033 Section 2 (Braintree District Council, adopted July 2022)
- Chelmsford Local Plan, Our Planning Strategy 2013 to 2036 (Chelmsford City Council, adopted May 2020)
- Basildon District Local Plan Saved Policies (Basildon Council, September 2007, updated October 2018)
- Brentwood Local Plan 2016 – 2033 (Brentwood Borough Council, adopted March 2022)
- Thurrock Local Development Framework, Core Strategy and Policies for Management of Development (Thurrock Council, adopted January 2015).

Guidance

8.2.33 Relevant guidance, specific to Ecology and Biodiversity, that has informed this ES (Volume 6 of the DCO application), comprises:

- Environmental Improvement Plan 2023 (Defra, 2023a)
- The UK Post-2010 Biodiversity Framework (2011-2020) (Joint Nature Conservation Committee (JNCC) and Defra, 2012)
- Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland: terrestrial, freshwater, coastal and marine (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018), referred to hereafter as the CIEEM EcIA Guidelines
- Biodiversity Net Gain: Good Practice Principles for Development (CIEEM, Construction Industry Research and Information Association (CIRIA), Institute for Environmental Management and Assessment (IEMA), 2019)
- Guidance: Biodiversity Net Gain (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities, 2024)
- BS 42020:2013 Biodiversity: Code of Practice for Planning and Development (British Standards Institution, 2013)
- Essex Green Infrastructure Standards Technical Guidance (Essex County Council, 2022).

8.2.34 It should be noted that the CIEEM EcIA guidelines (CIEEM, 2018) use the term Important Ecological Feature (IEF). In this chapter the term *'biodiversity receptor'* is used and is defined as an equivalent term for a feature/receptor that is of sufficient ecological value to be important in the decision-making.

8.3 Scope of the Assessment

8.3.1 The scope of the assessment has been informed by the Environmental Impact Assessment (EIA) Scoping Report (document reference 6.19) and EIA Scoping Opinion (document reference 6.20) provided by the Planning Inspectorate in 2022 on behalf of the Secretary of State. The scope has also been informed through consultation and engagement with relevant consultees. A summary of the scope of the Ecology and Biodiversity assessment is provided in Appendix 5.2: Scope of the Assessment (document reference 6.5.A2).

8.3.2 In addition, the EIA Scoping Opinion, together with a response from National Grid against each point raised by the Planning Inspectorate relevant to Ecology and Biodiversity, is provided in Appendix 5.1: National Grid's response to the EIA Scoping Opinion (document reference 6.5.A1).

Project Engagement and Consultation

8.3.3 Consultation and engagement with relevant stakeholders has informed the assessment presented in this chapter. Responses to representations received during the statutory consultation in summer 2024 and subsequent consultations in 2025 are provided in Appendix K and Appendix M of the Consultation Report (document reference 5.1).

8.3.4 A summary of discussions and how these have influenced the Project, scope and the approach to the assessment are provided in Table 8.1.

Table 8.1 Engagement undertaken relevant to Ecology and Biodiversity

Reference	Comments	National Grid's Response
Natural England, June to September 2022 (meetings)	Meetings held to outline and agree the proposed scope for wintering/passage bird surveys, in support of the EcIA and HRA. In July 2022, a technical note was issued to Natural England to provide detail on the proposed scope for wintering/passage bird surveys. The meeting in September 2022 was held to further discuss the methodology and agree the scope. For further details see the HRA[5].	Agreement in September 2022 from Natural England of the wintering/passage bird survey scope. Further detail is included within the draft Statement of Common Ground (SoCG) (document reference 5.9.14).
Natural England, August 2022 (meeting)	A meeting was held with Natural England District Licensing Team to discuss the use of great crested newt District Level Licensing (DLL) for the Project.	Agreement in August 2022 from Natural England that DLL can be used for the Project as set out within the SoCG (document reference 5.9.14). Letter of comfort received from their DLL team. Further detail is included within the countersigned Impact Assessment and Conservation Payment Certificate (IACPA).
Natural England, May to June 2023 (technical note)	A technical note was issued to Natural England outlining the proposed scope for breeding bird, hazel dormouse and bat static surveys.	Natural England were in agreement that the survey methodology is in line with good practice and the approach to defining survey areas for these species. Further engagement was needed to agree the scope of the hazel dormouse surveys.
Natural England, October to November 2023 (technical note)	Discretionary Advice Service for agreement with Natural England regarding the scope of hazel dormouse surveys.	It was agreed with Natural England that any survey areas where the survey effort did not meet the appropriate guidelines (i.e., not meeting an Index Probability Score of 20) in 2023, would be resurveyed in 2024 (which was completed). During the subsequent design review, it was noted that the

[5] Consultation relating to the EcIA with Natural England on birds was run alongside the approach to the HRA, which is set out with the HRA report (document reference 5.3) and therefore not included here.

Reference	Comments	National Grid's Response
		potential effects to Area 12 (see Appendix 8.12: Hazel Dormouse Report (document reference 6.8.A12)) were significantly reduced – where two hedgerows passed under the proposed overhead line there would be no loss or fragmentation of hazel dormouse habitat; therefore, it was agreed a repeat of the survey at Area 12 in 2024 was not needed. This was agreed with Natural England as set out in the SoCG (document reference 5.9.14).
Natural England, May 2024 (meeting)	A meeting was held with Natural England to agree the scope of bat surveys.	As set out in the SoCG (document reference 5.9.14). the following was agreed with Natural England and has been considered within this chapter: • The scope of surveys would include a Ground Level Tree Assessment (GLTA), static detector surveys, Advanced Licence Bat Survey Techniques (ALBST) (radio-tracking) surveys and aerial tree climbed inspections. • Where aerial tree climbing cannot be undertaken due to access / Health and Safety constraints, emergence surveys using infra-red cameras would be undertaken. • Bat Conservation Trust (BCT) guidelines (Collins, 2023) would be followed for GLTA surveys. • BCT bats and Artificial Lighting Guidance would be considered if mitigating potential effects of light is required.
Local Planning Authorities, May 2024 (technical note)	This technical note outlined the ecological survey scope for protected species other than those licensable by Natural England (or associated with the HRA) for agreement with all Local Planning Authorities affected by the Project.	The survey approach for hedgerows, protected/notable plant communities, terrestrial invertebrates, breeding birds and reptiles has been agreed with the Local Planning Authorities.

Reference	Comments	National Grid's Response
	Survey methodology details were also provided in the Preliminary Environmental Information Report (PEIR), however, this note was prepared in parallel to the PEIR. Its purpose was to seek agreement with the relevant officers at the Local Planning Authorities on survey methodology and to inform SoCGs. Details (including figures) were only provided in this note where: • The survey scope offered a pragmatic impact-based approach where not all land within the draft Order Limits would be surveyed. • Survey scope may deviate from guidance or best practice.	
Environment Agency, July to September 2024 (meetings)	Meetings to discuss and agree survey scope of aquatic ecology.	As stated within the SoCG (document reference 5.9.14). surveys were agreed with the Environment Agency to be scoped out for aquatic invertebrates and macrophytes. No Environment Agency fish survey data was available for 12 catchments, therefore further surveys were undertaken.
Natural England, October 2024 (meeting)	Discussion around the approach to mitigation as set out below. Bats - National Grid proposed that the Project would follow a post-consent approach to survey roosts due to transient nature of roosts and long timeframe between the design phase and anticipated construction start date. National Grid proposed that they would set out a procedure that would be used during construction, avoiding the need for conversations/licences for each roost found separately. Badger - National Grid outlined that for outlier and subsidiary setts an approach for agreeing principles of mitigation, similar to a class licence, would look to be	Mitigation measures have been designed in line with good practice and set out in the Section 8.6 of this chapter, the Outline CoCP (document reference 7.2) and the Outline LEMP (document reference 7.4). A Project wide bat licence would be applied to enable the removal of and/or disturbance to non-maternity summer roosts of low conservation value and maternity roosts of high value (common and rarer species). The Project would seek to obtain bespoke licences to remove and/or disturb bat roosts not covered by the

Reference	Comments	National Grid's Response
	agreed to allow flexibility should a new sett be found prior to/during construction, thereby reducing the number of licences required. For main setts, bespoke mitigation would be implemented for each impacted sett which would be agreed separately with Natural England. Natural England advised organisational/class licences already exist for badger, which require relatively standard mitigation so could in principle be used. They then recommended that a Project wide licence be used for non-main setts and bespoke licences for main setts. Natural England commented that with these licences there is a lot of up-front work and licences would likely take a couple of months to be issued, but would streamline the process post consent. Natural England commented that there are always caveats in the Letter of No Impediment (LONI) should the Project change. Water Vole - Natural England stated for a LONI, the 50 m displacement would be in line with class licence conditions. Natural England could approve this, assuming conditions of the licence are met. Natural England noted that they likely would not want to go down a Project wide licence route unless the conditions of class licence could be met. Natural England stated that projects have had a better experience for dispersion with water draw down and the Project will need to ensure sufficient adjacent habitat/space for dispersion. Hazel Dormouse - National Grid outlined that mitigation would include replacing vegetation (noting restrictions on planting under overhead lines and over the top of cables) and installation of dormouse boxes prior to vegetation clearance. Clearance would follow a single or two staged removal strategy. National Grid discussed whether the draft licence could cover the specific locations where	Project wide licence, on a case-by-case basis. Such licences would be sought as a last resort when effects cannot be avoided, with works timed to minimise effects to bats and maintain the favourable conservation status of the bats. As part of the licensing approach the Project would set out a procedure to be used during construction, that would avoid the need for separate conversations/licences for each bat roost found. A Project wide badger licence would be sought to enable the temporary or permanent closure of outlier and subsidiary setts that would be disturbed or removed by the Project. A bespoke badger licence would be applied for on a case-by-case basis to disturb or close a main or annexe sett. Such licences would be sought as a last resort when effects cannot be avoided, with appropriate mitigation in place to minimise effects to badgers. A water vole licence would be applied for to displace water vole. A hazel dormouse licence would be applied for to remove or manipulate habitat that supports hazel dormouse where these works are required to facilitate the Project. An otter licence would be applied for to close any confirmed holt sites where these works are required to facilitate the Project.

Reference	Comments	National Grid's Response
	presence has been identified for the LONI and if there is an option to licence a precautionary approach in other certain locations. Natural England agreed to look over pre-submission applications and provide LONIs. For areas where presence is not identified, Natural England would not issue a licence on a precautionary basis and a new licence would be required if hazel dormouse is found to be present. Discussion around the submission of one licence for all areas with confirmed presence. Otter - National Grid outlined that the mitigation being considered is a bespoke package for locations where effects are unavoidable (i.e., within 30 m of holt). Potential for inclusion of otter ledges on bridges/culverts where fragmentation issues identified. It was noted that a draft overarching licence would ideally be shared to obtain the LONI. National Grid asked to discuss and agreed the distance referred to above (30 m) as part of the licence terms, as there are no definitive distances within guidance. This distance was selected as it has been agreed with Natural England on similar projects in East Anglia.	Drafts of all licences above have been shared with Natural England to obtain LONIs. Discussions are ongoing.
Natural England, February 2025 (meeting)	National Grid set out the approach for managing temporary disturbance effects of golden plover and lapwing using Functionally Linked Land (FLL) during the construction phase in a presentation delivered in February 2025. An assessment was completed based on the numbers present and suitable alternative land within the surrounding area to determine enough land was available to avoid the need for the creation of alternative habitat. Natural England were presented with a map of alternative habitat and agreed with the approach.	The approach is set out in the HRA (document reference 5.3) as agreed with Natural England.

8.4 EIA Approach and Methods

8.4.1 This section describes the methodology used to establish the existing and future baseline, together with the methodology/approach used to undertake the assessment on Ecology and Biodiversity. The overarching approach is described in Chapter 5: EIA Approach and Method (document reference 6.5).

Data Sources

8.4.2 The baseline has been informed by a desk study and site survey data which has drawn on the following information sources:

- Aerial imagery (APEM, 2022) – Project commissioned imagery captured using fixed-wing aircraft at a resolution of 3 cm
- Google Earth (Google Earth, 2025) – freely available aerial photography reviewed to inform the baseline for habitats and species
- Multi-Agency Geographic Information for the Countryside (MAGIC) (Natural England, 2025)
- Environmental record centres – data requests have been made to Norfolk Biodiversity Information Service, Suffolk Biodiversity Information Service, Essex Field Club and other organisations that hold ecological data; relevant data sources are set out in Appendices 8.1 to 8.16 (document references 6.8.A1 to 6.8.A16).

Study Area

8.4.3 The CIEEM EcIA Guidelines (CIEEM, 2018) require assessments to be focused on a Zone of Influence (ZoI) – defined as being the area over which changes arising from construction and operation (and maintenance) could lead to ecologically significant effects.

8.4.4 As defined in the EIA Scoping Report (document reference 6.19) and agreed within the EIA Scoping Opinion (document reference 6.20), the Study Areas used to inform the assessment are presented in Table 8.2. These were formalised through professional judgement of perceived impact pathways, good practice guidelines and engagement with stakeholders.

Table 8.2 Study Areas for Ecology and Biodiversity receptors

Ecology and Biodiversity Receptor	Study Area for Assessment
Statutory designated sites of international importance (National Site Network (NSN) and Ramsar Sites)	2 km from the Order Limits for SAC (extended to 30 km where bats are the qualifying feature and 10 km where otters are) and 20 km for SPA and Ramsar Sites; see Figure A8.16.1: Statutory Designated Sites for Biodiversity – Ramsar Sites and Special Protection Areas and Figure A8.16.2: Statutory Designated Sites for Biodiversity (excepting Ramsar Sites and Special Protection Areas) in Appendix 8.16: Designated Sites (document reference 6.8.A16).
National and local sites designated for biodiversity (statutory and non-statutory) – Includes SSSI, NNR, Local Nature Reserves (LNR), Local Wildlife Sites (LWS), County Wildlife Sites (CWS) and Roadside Nature Reserves (RNR).	2 km from the Order Limits; see Figure A8.16.2: Statutory Designated Sites for Biodiversity (excepting Ramsar Sites and Special Protection Areas) and Figure A8.16.3: Non-Statutory Designated Sites for Biodiversity in Appendix 8.16: Designated Sites (document reference 6.8.A16). Where the Project overlapped with a SSSI Impact Risk Zone for electricity infrastructure projects the SSSI was also considered part of the Study Area to identify any direct pathways to effects.
Protected species, species of conservation concern, HPI and invasive species	Various, ranging from within the Order Limits to up to 2 km from the Order Limits as described in Appendices 8.1 to 8.16 (document references 6.8.A1 to 6.8.A16).
Ancient woodland	200 m from the Order Limits as described in Appendix 8.1: Habitat Report (document reference 6.8.A1) and shown on Figure A8.1.3: Ancient Woodland Locations (document reference 6.8.A1).

Site Survey

8.4.5 The approach to survey works specific to ecology and biodiversity receptors is detailed in Table 8.3 Biodiversity Survey Reporting. A suite of surveys was undertaken between September 2022 to the end of March 2025 and the results of these surveys are noted where relevant in this chapter. Surveys have continued in 2025, post-March 2025 for completeness. A summary of the surveys undertaken and when the findings will be available is provided in Table 8.4.

Table 8.3 Biodiversity survey reporting

Report Title	Survey Area
Appendix 8.1: Habitat Report (document reference 6.8.A1)	UK Habitat (UKHab Ltd., 2023) survey (UKHab – within and immediately adjacent to the Order Limits. UKHab surveys were undertaken within the Order Limits between May 2023 and March 2025 to categorise the different habitats present, including HPI listed in the NERC Act 2006 GWDTE – the UKHab data and desk study data relating to statutory and non-statutory designated sites was reviewed to identify habitats that could be affected by the Project.
Appendix 8.2: National Vegetation Classification Report (document reference 6.8.A2)	Targeted NVC surveys were undertaken in 2024 at locations that met specific criteria as set out in the report to identify Habitat of Principal Importance. Surveys were undertaken in accordance the NVC Users' Handbook (Rodwell, 2006).
Appendix 8.3: Hedgerows Regulations Report (document reference 6.8.A3)	*'Important'* hedgerow survey – within and adjacent to the Order Limits. Targeted field surveys were undertaken in 2024 at *'impacted'* hedgerows that met specific criteria as set out in the report. Surveys were undertaken in accordance with the Hedgerows Regulations 1997.
Appendix 8.4: Aquatic Report (document reference 6.8.A4)	Aquatic surveys – within the Order Limits at targeted Water Framework Directive (WFD) catchments impacted by open cut channel works. Fish habitat surveys – 50 m upstream and 50 m downstream of each proposed watercourse crossing based on standard guidance on habitat suitability for sensitive fish species, including salmonid fish (Scottish Fisheries Co-ordination Centre (SFCC), 2007; Hendry and Cragg-Hine, 1997), and eel (Tesch, 2003). Environmental deoxyribonucleic acid (eDNA) sampling - at least one eDNA sample was attempted for each WFD catchment where baseline data was not available. Methodology followed NatureMetrics' standard operating procedure (Nature Metrics (2024)), which is consistent with the current draft of the BS EN 17805: Water sampling for capture of microbial environmental DNA in aquatic environments (British Standards Institution, 2023).

Report Title	Survey Area
Appendix 8.5: Terrestrial Invertebrate Report (document reference 6.8.A5)	Scoping survey – Invertebrate Habitat Potential (IHP) – within the Order Limits at 37 locations following desk study. The assessment was undertaken with reference to the (as yet unpublished) Invertebrate Habitat Potential Protocol (Dobson and Fairclough, unpublished). Targeted sampling surveys at 36 Invertebrate Survey Areas (ISAs), comprising pan traps, pitfall traps, window flight interception traps, light trapping, sweep netting, beating and hand searching (grubbing). This approach relates to the guidance set out in Surveying terrestrial and freshwater invertebrates for conservation evaluation (Drake *et al.*, 2007).
Appendix 8.6: Reptile Report (document reference 6.8.A6)	Reptile surveys – within and adjacent to the Order Limits. Following a desk study and habitat suitability assessment, targeted field surveys were undertaken across five locations in 2024 following a robust desk study to identify potential Key Reptile Sites (KRS). Reptile presence/likely absence surveys were undertaken following methodology which draws upon Herpetofauna Groups of Britain and Ireland (HGBI, 1998), Froglife (1999 and 2015) and Natural England (2011).
Appendix 8.7: Breeding Bird Report (document reference 6.8.A7)	Breeding bird surveys – within Order Limits, plus a 200 m buffer. Breeding bird surveys were undertaken in 2023 and 2024 at seven targeted locations following a robust desk study. A buffer of approximately 200 m was applied to ensure enough data was captured to undertake territorial analysis. Surveys followed Bird Survey Guidelines (Bird Survey and Assessment Steering Group, 2025) and comprised walked transects, designed to ensure surveyors were able to survey within 50 m of all points. Barn owl surveys – within Order Limits. Trees within the Order Limits were assessed from the ground for barn owl roosting potential. Where potential existed, notes were provided on occupation evidence and whether the features were likely used as a nest site or roost site. Other Schedule 1 birds – within the Order Limits. Schedule 1 bird species were recorded during the breeding bird surveys. This information has been assessed together with incidental sightings as part of other ecological surveys and desk study records for the remainder of the Order Limits.

Report Title	Survey Area
Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)	Wintering bird surveys – within the Order Limits, plus a 500 m buffer. Wintering bird surveys were undertaken in 2022 and 2023 to inform both the impact assessment and the HRA (document reference 5.3). Vantage point surveys to assess potential collision risk were undertaken at 14 locations across the Project. Survey locations were targeted at areas where *'at risk'* bird species were considered at higher risk of collision, such as watercourses and wetland habitat. Methodology was based on NatureScot guidance to inform onshore wind farm development assessments (Scottish Natural Heritage, 2017), adapted for overhead lines.
Appendix 8.9: Bat Roost Report (document reference 6.8.A9)	GLTA – within the Order Limits. Impacted trees (as set out in Appendix 8.9: Bat Roost Report (document reference 6.8.A9)) within the Order Limits have been surveyed from the ground to assess their potential to support roosting bat species in accordance with best practice (Collins, 2023).
Appendix 8.10: Bat Activity Report (document reference 6.8.A10)	Bat activity surveys (automated detectors) – within the Order Limits. In 2023 and 2024, automated bat detectors (static detectors) were placed at pre-determined red and amber rated locations (following an initial scoping assessment – as defined in Appendix 8.10: Bat Activity Report (document reference 6.8.A10)). Following best practice guidance (Collins, 2023), static detectors in red rated locations were operational for five consecutive nights per month from May to September. At amber rated locations static detectors were operational for five consecutive nights in pre-parturition (spring), maternity (summer) and post-parturition (autumn).
Appendix 8.11: Bat Radio-Tracking Report (document reference 6.8.A11)	ALBST – within the Order Limits and surrounding suitable habitat. Targeted surveys based on site selection criteria set out within Appendix 8.11: Bat Radio-Tracking Report (document reference 6.8.A11). One site (Blackbrook-Langham (Essex)/Stratford St Mary (Suffolk)) within Section C of the Project was surveyed in 2024. ALBST methodology followed good practice as set out in Collins (2023).
Appendix 8.12: Hazel Dormouse Report (document reference 6.8.A12)	Hazel dormouse surveys – within and adjacent to the Order Limits.

Report Title	Survey Area
	Targeted field surveys were undertaken across 25 locations in 2023 and 2024 following a robust desk study to identify key locations. The survey methodology followed Natural England's standing advice that referred to the Dormouse Conservation Handbook (English Nature, 2006). To determine presence or likely absence of hazel dormouse, a minimum of 50 nest tubes were placed in a site (equivalent to one of the survey areas identified for this Project) within suitable habitat between the months of April and November.
Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13)	Otter and water vole survey – all impacted watercourses and associated riparian habitat, 200 m up and downstream. Following an initial habitat assessment to look for signs of otter and water vole activity and assess the suitability to support water vole, suitable watercourses were subject to further survey, in accordance with otter and water vole good practice guidance (Chanin, 2003a; Chanin, 2003b; Dean *et al.*, 2016 and Liles, 2003) and CIEEM competencies for undertaking otter surveys (CIEEM, 2013).
Appendix 8.14: Species of Principal Importance Report (document reference 6.8.A14)	Desk study data and incidental survey records only – within the Order Limits. Any Species of Principal Importance (SPI) identified when undertaking other survey types were recorded incidentally and combined with desk study records.
Appendix 8.15: Badger Report (document reference 6.8.A15)	Badger survey – within the Order Limits, plus a 30 m buffer. Badger surveys were aimed at targeting main badger setts only, and where practicable, setts were classified using the criteria and guidance stated in Surveying Badgers (Harris *et al.*, 1989).

8.4.6 Table 8.4 presents details of further surveys undertaken post-March 2025. The assessment within this chapter includes a reasonable worst case scenario for the additional baseline data collected to ensure a full assessment can be completed with the appropriate mitigation (if required) applied. Any changes to the assessment as set out in this ES (Volume 6 of the DCO application) will be presented as further environmental information as stated in Table 8.4.

Table 8.4 Post-March 2025 surveys

Survey	Survey Dates	Further Environmental Information to be Provided	When Survey Information Will Be Available	Agreement with Stakeholders
Stage 2 habitat surveys	April to September 2025	Results of the Stage 2 habitat surveys – on the ground UKHab and condition surveys of the remaining 12.5% (approximately) of the Order Limits	Further environmental information available in November 2025	In a letter dated 4 July 2025 Natural England confirmed that they were in agreement with the Project approach to providing Further Environmental Information as soon as it becomes available prior to the start of the Examination.
Breeding bird surveys	April to July 2025	Results of two breeding bird survey locations – Survey Area 8 – Boxted (Section C) and Survey Area 9 - Tilbury North (Section H)) (remaining approximately 22% of survey)	Further environmental information available in November 2025	See above re letter data 4 July 2025
Bat GLTA surveys	April to September 2025	Results of GLTA surveys covering the remaining 12.5% of the Order Limits including: • Stage 2 aerial inspections/emergence surveys on eight areas where a Potential Roost Feature (PRF) – Multiple (PRF-M) have been identified • Bat tracking results for two locations	Further environmental information available in November 2025	See above re letter data 4 July 2025

Survey	Survey Dates	Further Environmental Information to be Provided	When Survey Information Will Be Available	Agreement with Stakeholders
Bat activity surveys	May to September 2025	Results of 3 statics over the May period to supplement the June-September results and 9 additional static detector locations to be undertaken between May-September 2025	Further environmental information available in November 2025	See above re letter data 4 July 2025
Otter and water vole surveys	1st visit April to June and 2nd visit July to September	Results of 72 watercourses to be surveyed for water vole and otter (remaining approximately 35% of survey).	Further environmental information available in November 2025	See above re letter data 4 July 2025
Badger Surveys	April to September 2025	Results of badger sett surveys undertaken April 2025 onwards. Expected to include remaining 12.5% of the Order Limits (access dependent).	Further environmental information available in November 2025	See above re letter data 4 July 2025

Assessment Methodology

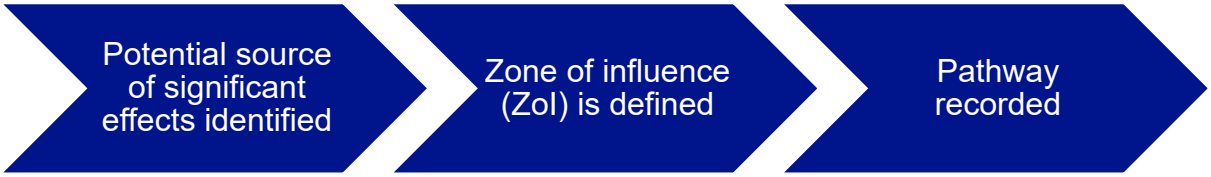
8.4.7 This section sets out the methodology used for assessing the effects on Ecology and Biodiversity for those aspects scoped into the assessment, as set out within Chapter 8 of the EIA Scoping Report (document reference 6.19) and agreed within Section 3.6 of the EIA Scoping Opinion (document reference 6.20) and any additional aspects agreed to be assessed with stakeholders. The scope of the Ecology and Biodiversity assessment is provided in Appendix 5.2: Scope of the Assessment (document reference 6.5.A2).

8.4.8 The assessment methodology is aligned with the CIEEM EcIA guidelines (CIEEM, 2018), with some minor amendments to allow consistency of terms across different EIA topics within this ES (Volume 6 of the DCO application). The assessment is based on the results of the desk study and survey work, together with relevant published information (including the status, distribution, and sensitivity to environmental changes of ecological features), consultation and engagement with Natural England and other key consultees, and professional judgement. As such the technical scope of assessment includes ecology and biodiversity receptors that meet the following criteria:

- Are of sufficient value that effects on them may be significant
- Are potentially vulnerable to significant effects that may arise as a result of the Project.

8.4.9 To understand how the Project may result in potentially significant effects on ecology and biodiversity receptors the source-pathway-receptor approach has been followed.

Image 8.1 Source-Pathway-Receptor Approach



8.4.10 For a significant effect to occur, all three elements (listed above) must be in place, with the absence of one meaning there is no likelihood for an effect to occur.

Importance/Value

8.4.11 The criteria used to determine the importance/value of ecology and biodiversity receptors are set out in Table 8.5. These are based on the CIEEM EcIA guidelines (CIEEM, 2018). The term *'value'* has been used in addition to *'importance'* to provide consistency in terminology between different environmental topics within the EIA in this ES (Volume 6 of the DCO application). The corresponding *'importance'* and *'value'* categories are also presented in Table 8.4.

Table 8.5 Criteria for ascribing importance/value to biodiversity receptors

CIEEM Importance	Value	Criteria
International	Very High	European designated sites: SPAs; potential SPAs; SACs; candidate or possible SACs, and Wetlands of International Importance (Ramsar Sites).
National	High	Statutory designated sites, comprising SSSIs and National Nature Reserves (NNRs*). 'Irreplaceable natural habitat'* e.g., ancient woodland, veteran trees, blanket bog, limestone pavement, sand dunes, saltmarsh and lowland fen. Species recorded as *'critically endangered'* under the International Union for Conservation of Nature Red List of Threatened Species (IUCN, 2024); resident or regularly occurring populations of species which may be considered at an international or national level where either of the following criteria is met: • The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale, or • The population forms a critical part of a wider population at this scale. Nationally Rare or Scarce taxa: Nationally Rare taxa are those occurring in 15 or fewer 10 x 10 km Ordnance Survey grid-squares in the UK; Nationally Scarce species are those occurring in 16-99 10 x 10 km squares.
County/Regional	Medium	Statutory designated sites: Local Nature Reserves. Non-statutory designated sites (i.e., Essex Local Wildlife Sites, Suffolk CWSs, Norfolk CWS and Roadside Nature Reserves). Areas of key/Priority habitats, species or habitats listed in accordance with the requirements of the NERC Act 2006. Resident or regularly occurring populations of species which may be considered at a regional or county level where either of the following criteria is met: the loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or the population forms a critical part of a wider population at this scale.
Local	Low	Receptor is relatively common and widespread (e.g., it is listed in accordance with the requirements of s41 of the NERC Act 2006, Birds of Conservation Concern Red or Amber listed, Red Data Book (Stanbury *et al*, 2021 listed and/or is legally protected).
Site	Negligible	Receptor is abundant and widespread, receives no legal protection and is not of elevated conservation concern status.

8.4.12 Assigning importance/value to ecology and biodiversity receptors is based on professional judgement informed by available guidance and information and, where necessary, expert advice.

8.4.13 As outlined in the CIEEM EcIA guidelines (CIEEM, 2018), those ecology and biodiversity receptors of sufficient value to be considered important in decision-making (i.e., those considered to be of *'Local'* importance or above), and which it is considered could experience significant effects as a result of the Project (i.e., effects that could affect the integrity of the habitat or the favourable conservation status of a species' population), are classified as ecology and biodiversity receptors and thus considered in the detailed assessment.

8.4.14 Other biodiversity receptors (i.e., those which are of less than *'Local'* importance) are scoped out, as agreed within the EIA Scoping Opinion (document reference 6.20), and not subject to any further assessment within the ES (Volume 6 of the DCO application).

8.4.15 In accordance with the CIEEM EcIA guidelines (CIEEM, 2018), where there is the potential for a breach of legislation in relation to protected species (regardless of their importance), those species are also considered.

8.4.16 Following identification and valuation of the ecology and biodiversity receptors, it is then necessary to investigate potential impacts on them to understand how they might be affected by the Project.

Characterisation of Effect

8.4.17 The impact assessment is based on an understanding of the likely activities associated with the Project, the biophysical changes that are predicted as a result of these activities and the area over which such effects might be experienced by different ecology and biodiversity receptors.

8.4.18 When describing effects, reference is made to the following characteristics:

- Positive or negative
- Extent
- Magnitude
- Duration (assessed as either *'short-term'* (up to 1 year), *'medium-term'* (1-10 years) or *'long-term'* (greater than 10 years))
- Frequency and timing
- Reversibility.

Impact Magnitude

8.4.19 The criteria used to determine the magnitude of change affecting an ecology and biodiversity receptor is set out in Table 8.6. Criteria for Magnitude of Impact for Ecology and Biodiversity Receptors. When describing the magnitude, terminology has been set for this impact assessment and linked to the terms used in the CIEEM EcIA guidelines (CIEEM, 2018).

Table 8.6 Criteria for magnitude of impact for Ecology and Biodiversity receptors

Magnitude	Criteria and Resultant Effect
Large	Negative: Total loss or major alteration to key elements or features of the baseline conditions to the extent that post-development character composition of baseline conditions would be fundamentally changed Positive: Large-scale or major improvement of quality; extensive restoration or enhancement; major improvement in attribute quality
Medium	Negative: Loss or alteration to one or more key elements or features of the baseline conditions to the extent that post-development character or composition of the baseline conditions would be materially changed Positive: Benefit to, or addition of key characteristics, features or elements; improvements of attribute quality
Small	Negative or Positive: Changes arising would be detectable but not material; the underlying character or composition of the baseline conditions would be similar to the pre-development situation
Negligible	Negative or Positive: No change from baseline conditions

Significance

8.4.20 The assessment of likely significant environmental effects as a result of the Project has considered the construction and operation (and maintenance) phases.

8.4.21 The assessment of significant effects on ecology and biodiversity receptors has been determined using the source-pathway-receptor approach along with the following:

- Consideration of good practice/guidance
- Professional judgement
- Consideration of the baseline information obtained, the Project details and comments raised through stakeholder consultation
- Prediction of potential effects based on baseline information and the Project details
- Quantification of potential effects
- Identification of appropriate mitigation measures
- Prediction of residual effects based on baseline information, the Project details and mitigation measures.

8.4.22 The significance of an effect on a receptor has been determined following an analysis of the factors that characterise the effect. The CIEEM EcIA guidelines (CIEEM, 2018) define significant effects as those that *'…either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general... In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)'.*

8.4.23 Significant effects, as defined by the CIEEM EcIA guidelines (CIEEM, 2018), are determined by assessing any deviation in baseline conditions of a receptor that may

occur as a result of individual and cumulative effects during the construction and operation (and maintenance) of the Project.

8.4.24 Significance has been determined on the basis of a likely negative effect on the integrity or favourable conservation status of a receptor that would be significant at a given geographic scale. The geographical scale at which an effect is significant can vary from the geographical importance of the biodiversity receptor being assessed and in accordance with the CIEEM EcIA guidelines (CIEEM, 2018).

Limitations of Assessment

8.4.25 Desk study information has been collected, and survey work has been progressed throughout the design iterations. Consequently, some of the data that has been collected relates to areas that are no longer within the Order Limits. Where this data is no longer relevant to the assessment it has been removed from the baseline data. Data relating to more mobile species has been retained where it provides contextual information for the impact assessment.

8.4.26 Desk study information was gathered to inform the EIA Scoping Report (document reference 6.19) in 2022 and updated in April 2025 (where needed). The purpose of this study was to provided information on the distribution of habitats and species within the ZoI for the Project. Targeted surveys have been undertaken to provide more accurate and up-to-date information for land within the Order Limits .as identified under the '*Site Survey*' heading earlier in this section.

8.4.27 Surveys undertaken post-March 2025 will be provided as further environmental information in November 2025, see Table 8.4. These results will further supplement the already robust approach for targeted mitigation measures for breeding birds, bats, otter and water vole and ground truth the nature of habitats for a limited number of areas within the Order Limits as set out in Table 8.3. It is assumed; the results would not lead to the identification of new ecology and biodiversity receptors or materially alter the assessment within this chapter; they are to inform locations where targeted mitigation and/or pre-construction surveys would be required.

Key Parameters for Assessment and Assumptions

8.4.28 This section describes the key parameters and assumptions that have been used/made when undertaking the assessment presented within this chapter. The assumptions are based on information presented within Chapter 4: Project Description (document reference 6.4) and include:

- Vegetation loss: The assessment is based on the vegetation clearance assumptions set out in Chapter 4: Project Description (document reference 6.4) and presented on the Trees and Hedgerows to be Removed and or Managed Plans (document reference 2.16)
- Reinstatement: Habitat removed during construction would be reinstated (with the exception of planting restrictions associated with operational requirements as identified within the Outline LEMP (document reference 7.4))
- Night working: Although most of the works would be expected to occur during normal daytime hours, some activities would require night-time working. As such, it is assumed that there is potential for night-time works at all trenchless crossing locations. Additionally, in practice, drilling would occur in one direction, with the

plant (and therefore the main noise source) located on one side of the crossing only, but it is assumed that drilling may occur in either direction as a worst-case

- Lighting: The following lighting details are assumed:
  - A typical construction day would be 12-hours meaning in winter this would require working in the dark at either end of the day. For the purposes of the ES (Volume 6 of the DCO application), it is therefore assumed that winter working would require lighting at certain sites but would not be wide scale across the Project
  - All works associated with operational substations and Cable Sealing End (CSE) compounds - exterior and interior lighting would be provided at the site to allow for safe movement and the operation of equipment. All lighting would be designed in accordance with the appropriate design standards as set out in the Outline CoCP (document reference 7.2)
- Piling assumptions: Pylon locations, all CSE compounds, both new substations and the substation extension at Bramford may require percussive piling. As a reasonable worst-case scenario, it is assumed that piling would be required at all these locations
- Trenchless crossing construction methodology: The Project has committed to undertaking trenchless crossings at the following five locations (all within Project Section C): Higham Road, River Stour (north part), River Stour (south part), A12 highway crossing, and railway crossing (east of Ardleigh) – these are shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1)
- Where excavation of soil is required, for example at the base of the pylons and for the cable trenches, and where water is encountered in the excavation, it would be pumped out using an appropriate pump and a sump made in the subsoil using the excavator. The water would be pumped from the sump and allowed to filter through silt traps. The assessment presented within the ES (Volume 6 of the DCO application) assumes that there may be the need for temporary '*short-term dewatering*', such as removal of rainwater or surface water when undertaking soil excavation. It is anticipated these would be local discharges to ground (after using settlement tanks) and not to watercourses. Where this is not practicable in localised areas, any discharge to surface water would be made in compliance with relevant consents
- It is also assumed that there would be no new temporary or permanent abstractions and that the water supply needs of the Project during construction would be sourced either from mains water supply or in remote locations, where this option may not be available, water would be tankered in. With regards to grey water generated from welfare facilities, it assumed that this would be discharged to the public sewer, or where this is not practicable, be collected and tankered off site to a licensed disposal facility.

8.5 Baseline Conditions

Existing Baseline

8.5.1 Baseline conditions have been gathered from desk-based information (see Section 8.4) and site surveys and presented with reference to the section of the Project within which they are located.

8.5.2 The full ecology and biodiversity baseline is presented in the supporting appendices, Appendices 8.1 to 8.16 (document references 6.8.A1 to 6.8.A16), with only those ecology and biodiversity receptors presented in this chapter where potential pathways to significant effects have been identified, as agreed within the EIA Scoping Report (document reference 6.19) and EIA Scoping Opinion (document reference 6.20).

Statutory Designated Sites

8.5.3 All statutory sites designated for biodiversity that were identified within the Study Area are shown on Figure A8.16.1: Statutory Designated Sites for Biodiversity – Ramsar Sites and Special Protection Areas and Figure A8.16.2: Statutory Designated Sites for Biodiversity (excepting Ramsar Sites and Special Protection Areas) within Appendix 8.16: Designated Sites (document reference 6.8.A16). The appendix also includes details of the location and distance from the Order Limits and sets out the reason for designation.

8.5.4 A total of 61 sites were identified, comprising 13 Ramsar Sites, 15 SPAs, one SAC, 19 biological SSSIs and 13 LNRs. It should be noted that all 19 biological SSSIs have Impact Risk Zones (IRZs) within the Order Limits which are relevant to the Project (i.e. pipelines, underground cables, pylons, overhead cables). .

8.5.5 No SACs designated for bats were recorded within 30 km of the Order Limits.

8.5.6 All Ramsar Sites, SPAs and SACs are of very high value (as sites of international importance), SSSIs are of high value (as sites of national importance) and LNRs are of medium value (as sites of county importance).

8.5.7 Although there are 61 statutory designated sites within the Study Area it was agreed within the EIA Scoping Report and the EIA Scoping Opinion that there would only be impact pathways associated with:

- Norfolk Valley Fens SAC (Section A)
- Flordon Common SSSI a component of the Norfolk Valley Fens SAC (Section A)
- Aslacton Parish Land SSSI (Section A)
- Forncett Meadows SSSI (Section A)
- Shelfanger Meadows SSSI (Section A)
- Roydon Fen LNR (also CWS) (Section A)
- Bramford Meadows LNR (also CWS) (Section B)
- Needham Lake LNR (Section B)
- Stour and Orwell Estuaries Ramsar Site and SPA (Section C)

- Cattawade Marshes SSSI a component of Stour and Orwell Estuaries Ramsar Site and SPA (Section C)
- Orwell Estuary SSSI a component of Stour and Orwell Estuaries Ramsar Site and SPA (Section C)
- Stour Estuary SSSI a component of Stour and Orwell Estuaries Ramsar Site and SPA (Section C)
- Brockwell Meadows LNR (Section E)
- Chelmer Valley Riverside LNR (Section F)
- Thames Estuary and Marshes Ramsar Site and SPA (Section H)
- Mucking Flats and Marshes SSSI a component of Thames Estuary and Marshes Ramsar Site and SPA (Section H)
- South Thames Estuary and Marshes SSSI a component of Thames Estuary and Marshes Ramsar Site and SPA (Section H).

Non-Statutory Designated Sites

8.5.8 All non-statutory sites designated for ecology and biodiversity that were identified within the Study Area are shown on Figure A8.16.3: Non-Statutory Designated Sites for Biodiversity within Appendix 8.16: Designated Sites (document reference 6.8.A16). The appendix also includes details of the location and distance from the Order Limits and sets out the reason for designation. A total of 370 sites were identified, comprising 242 LWSs, 111 CWSs, and 17 RNRs. All non-statutory designated sites are of medium value, as sites of county importance.

8.5.9 Of the 370 sites identified within the Study Area, impact pathways have been identified for 11 CWSs, 22 LWSs and one RNR. In addition, 28 CWSs and 26 LWSs have been identified that support GWDTE.

Habitats

8.5.10 The habitat baseline is based on desk study and field survey information that was available up to and including the end of March 2025. Every effort has been made to obtain land access to the full Order Limits, however where access was not available a combination of the high-definition aerial imagery, past aerial imagery data available on Google (Google Earth, 2023) and surveys from vantage points have overcome this limitation. Approximately 87.5% of the Order Limits have been subject to an on the ground UKHAB condition assessments, as of the end of March 2025. Surveys conducted beyond the end of March 2025 will be included in a further environmental information report (see Table 8.4).

Ancient Woodland

8.5.11 Ancient woodland is an irreplaceable habitat, of national importance and of high value.

8.5.12 A desk study has been undertaken to identify areas of ancient woodland within the Order Limits and within 200 m from the Order Limits. This identified 51 blocks of ancient woodland, of which 1.7 ha (six sites) fall within the Order Limits. All ancient woodland is shown on Figure A8.1.3: Ancient Woodland Locations within Appendix 8.1: Habitat Report (document reference 6.8.A1).

8.5.13 34 ancient woodland sites have been identified within 15 m from the Order Limits (15 m is the buffer zone within which effects on root systems of ancient/veteran trees may occur (Natural England and Forestry Commission, 2022)).

8.5.14 Note sites that have been identified as ancient woodland for the purpose of this impact assessment comprise sites that are identified as such by Natural England on the ancient woodland inventory in MAGIC (Natural England, 2025) and non-statutory designated sites of nature conservation importance that have been identified in their site description provided by the local record centres as supporting features and species characteristic of ancient woodland sites. Ancient woodland is identified as irreplaceable habitat by the UK Government and as such is of high value as a habitat of national importance.

Habitat of Principal Importance (HPI) in England

8.5.15 The HPI present within the Order Limits are listed in Table 8.7 (area based) and Table 8.8 (linear).

8.5.16 HPI are of medium value and of county importance. Full details are set out in Appendix 8.1: Habitat Report and shown on Figure A8.1.2: Habitats of Principal Importance and Figure A8.1.7: Linear Habitat Survey Result, within Appendix 8.1: Habitats Report (document reference 6.8.A1).

Table 8.7 Habitat of Principal Importance in England (areas) within the Order Limits

HPI	Area Based Habitat of Principal Importance within Order Limits, per Project Section (hectares)								
	A	B	C	D	E	F	G	H	Total
Arable field margins	0.3	0.6	< 0.1	4.2	2.3	8.9	0.8	0	**17.1**
Lowland meadows	0	0	0	0	0	0	0	0.9	**0.9**
Lowland dry acid grassland	0	0	3.7	0	0	0	0	5.7	**9.5**
Coastal and floodplain grazing marsh	2.5	0.8	6.0	0	0	0	0	0	**9.3**
Reedbeds	0	0	0.3	0	0	0	0	0	**0.3**
Ponds	0.2	0.1	0.1	0.1	< 0.1	< 0.1	0.3	<0.1	**1.0**
Open mosaic habitats on previously developed land	0	0	0	0	0	0	0	0.6	**0.6**

HPI	Area Based Habitat of Principal Importance within Order Limits, per Project Section (hectares)								
	A	B	C	D	E	F	G	H	Total
Lowland mixed deciduous woodland	8.5	10.0	13.8	6.4	5.5	5.4	7.4	3.8	**60.9**
Wet woodland	< 0.1	0.1	0	0	0	0	< 0.1	0	**0.2**

Table 8.8 Habitat of Principal Importance in England (linear) within the Order Limits

HPI	Linear Habitat of Principal Importance within Order Limits, per Project Section (kilometres)								
	A	B	C	D	E	F	G	H	Total (km)
Hedgerows	21.16	32.82	19.33	15.75	12.1	17.76	10.01	13.19	**142.12**
Rivers	0.9	1.67	1.24	0.54	0.66	0.96	1.18	0	**7.1**
Rivers (Chalk)	0.5	0	0	0	0	0	0	0	**0.5**
Total (km)	**22.56**	**34.49**	**20.57**	**16.29**	**12.76**	**18.72**	**11.19**	**13.19**	**149.8**

'Important' Hedgerows

8.5.17 All hedgerows within the Order Limits were subjected to UKHab surveys to inform BNG assessments. As set out in Appendix 8.3: Hedgerows Regulations Report (document reference 6.8.A3), 34 were assessed to be *'Important'* in terms of the wildlife and landscape criteria under the Hedgerow Regulations 1997. These are listed with reference to the Project Sections in Table 8.9 and shown on Figure A8.3.1: Hedgerows Regulations Assessment within Appendix 8.3: Hedgerows Regulations Report (document reference 6.8.A3). These are of medium value as habitat of regional importance. The remaining native species hedgerows were categorised as HPI of medium value as habitat of county importance.

8.5.18 On the ground UKHAB and condition surveys across the remaining 12.5% of the Order Limits are to be completed in 2025. Based on aerial imagery and habitats mapped from vantage points, it is not expected that any additional HPI will be identified in these areas. Habitat type and condition values have been assigned across the full Order Limits, with any areas not yet subject to full survey attributed a precautionary medium value and of county importance based on professional judgement. The results of the habitat surveys undertaken in 2025, will be included in a further environmental information report (see Table 8.4).

Table 8.9 *'Important'* hedgerows identified within the Order Limits

***'Important'* Hedgerows – Biodiversity by Project Section**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Number of '*Important'* hedgerows present within Order Limits	1	16	7	3	1	3	3	0

Groundwater Dependent Terrestrial Ecosystems

8.5.19 GWDTE are ecosystems that rely on groundwater for their water requirements. With respect to this Project they include the following HPI:

- Rivers
- Wet woodland
- Lowland fens
- Reedbeds
- Coastal and floodplain grazing marsh
- Eutrophic standing water (reservoirs)
- Ponds.

8.5.20 Designated sites that support GWDTE that are hydrologically linked to the Project comprise:

- Four SSSIs: Aslacton Parish Land SSSI (Section A), Forncett Meadows SSSI (Section A), Flordon Common SSSI (Section A), Shelfanger Meadows SSSI (Section A)
- Six LNRs: Roydon Fen LNR and CWS (Section A), Bramford Meadows LNR and CWS (Section B), Needham Lake LNR (Section B), Brockwell Meadows LNR (Section E), Chelmer Valley Riverside LNR (Section F) and Hutton Country Park LNR and LWS (Section G)
- 28 CWSs: Roydon Fen LNR and CWS (Section A), Bramford Meadows LNR and CWS (Section B), Bressingham Fen CWS (Section A), Brick Kiln Lane, Bunwell Hill CWS (Section A), Brock's Watering CWS (Section A), Bunwell Fen CWS (Section A), Carlton Rode Fen CWS (Section A), Dunston Common CWS (Section A), Flordon Meadow (East) CWS (Section A), Flordon Meadow (West) CWS (Section A), Hapton Common CWS (Section A), Horseford Meadow CWS (Section A), Muir Lane Meadow CWS (Section A), Tas Pond CWS (Section A), Tas Valley CWS (Section A), The Carr CWS (Section A), The Grange, Wreningham CWS (Section A), Wreningham Marsh CWS (Section A), Horse Fen CWS (Section A), Hall Farm Meadow CWS (Section B), River Gipping (Sections) CWS (Section B), River Waveney (Sections) CWS (Section B), Thrandeston Marsh CWS (Section B), Topcroft Farm Meadows CWS (Section B), Higham Meadow CWS (Section C), River Brett (Sections) CWS (Section C), Springhill Meadows CWS (Section C) and Wasses Marshes CWS (Section C)

- 26 LWSs: Ardleigh Reservoir Grassland LWS (Section C), Black Brook LWS (Section C), Bridges Farm LWS (Section C), Langham Water Works LWS (Section C), The Coombs LWS (Section C), Wall's Wood LWS (Section C), Fordham Bridge Meadow LWS (Section D), Marks Tey Brick Pit LWS (Section D), West Bergholt Alderwoods LWS (Section D), Blackwater Plantation LWS (Section E), Buckler's Farm Wood LWS (Section E), Coggeshall Hall Farm LWS (Section E), Feering Marsh LWS (Section E), Hoo Hall Meadows LWS (Section E), Tilkey Road Coggeshall LWS (Section E), Witham Marsh LWS (Section E), Border Wood Lake LWS (Section F), Broomfield – Little Waltham Chelmer LWS (Section F), Langleys Deer Park LWS (Section F), Little Waltham Village Meadows LWS (Section F), Lowley's Farm LWS (Section F), Writtle Bridge Meadow LWS (Section F), Hutton Country Park LWS and LNR (Section G), Little Burstead Wood LWS (Section G), Stock Brook Meadow LWS (Section G) and The Wilderness LWS (Section G).

8.5.21 Full details of the GWDTE analysis, including methodology and results, can be found in Appendix 8.1: Habitat Report (document reference 6.8.A1). The GWDTE have not been assigned a particular value, but they have been valued as a HPI or as an intrinsic part of a designated site.

Other Terrestrial Habitats

8.5.22 UKHab field surveys were undertaken within the Order Limits to establish a robust habitat baseline to inform impact assessment and BNG calculations. Details of all other terrestrial habitats (not included above) are set out within Appendix 8.1: Habitat Report (document reference 6.8.A1).

8.5.23 The Project falls within a primarily agricultural landscape, dominated by typical farmland habitats such as arable land and grazed-pasture fields, intersected by a network of hedgerows. Additional habitats of value present within the Order Limits comprised other lowland acidic grassland (0.4 ha), other neutral grassland (288.04 ha), reservoirs (1.25 ha), other broadleaved woodland (18.90 ha) and mixed woodland (3.38 ha). These habitats are of low value and local importance. Other habitats of negligible value were identified within the Order Limits; these comprised urban habitats, cropland, modified grassland and areas of tall forbs (ruderal herbs) and are not considered further.

8.5.24 On the ground UKHAB and condition surveys across the remaining 12.5% of the Order Limits are to be completed in 2025. Based on aerial imagery and habitats mapped from vantage points, it is not expected that any additional terrestrial habitats of value (other than HPI) will be identified in these areas. Habitat type and condition values have been assigned across the full Order Limits, with any areas not yet subject to full survey attributed a precautionary low value and of local importance based on professional judgement. The results of the habitat surveys undertaken in 2025, will be included in a further environmental information report (see Table 8.4).

Aquatic Macrophytes

8.5.25 A desk study for macrophytes was undertaken within the Order Limits and data was available for 18 of the 38 WFD catchments intersected by the Project, which are shown on Figure A8.4.1: Aquatic Ecology Baseline within Appendix 8.4: Aquatic Report (document reference 6.8.A4).

8.5.26 Only one nationally scarce and near threatened plant species was identified, galingale *Cyperus longus*, which was recorded in the Roxwell Brook WFD catchment (Section F), shown on Figure A8.4.1: Aquatic Ecology Baseline within Appendix 8.4: Aquatic Report (document reference 6.8.A4). This species of macrophyte is of county importance, which is in line with the supporting habitat (HPI Rivers), therefore the Roxwell Brook is of medium value as a habitat of county importance.

Invasive Plant Species

8.5.27 A desk study was undertaken of the area within the Order Limits which revealed the presence of three WCA Schedule 9 plant species associated with watercourses that are within the Order Limits. These are Canadian waterweed, New Zealand pigmyweed and giant rhubarb.

8.5.28 There were 51 findings of INNS listed under Schedule 9 of the WCA throughout the ecological surveys within and surrounding the Order Limits. Of the 51 findings, 15 were within the Order Limits. The most recorded and abundant species within the Order Limits was Himalayan balsam (eight sightings), followed by rhododendron (one sighting), Japanese knotweed (two sightings), giant hogweed (one sighting), and Australian swamp stonecrop (three sightings). Although common ragwort is not listed on Schedule 9 it is a threat to livestock and was recorded in one location. It is likely that this species is present elsewhere within the Order Limits but was not recorded as a plant species of note by surveyors as it is not an INNS. These invasive species records are shown on Figure A8.1.6: Invasive Plant Species within Appendix 8.1: Habitat Report (document reference 6.8.A1).

8.5.29 Invasive non-native plant species are not of ecological value, but they do pose a risk to ecology and biodiversity.

Fauna

Aquatic Macroinvertebrates

8.5.30 Macroinvertebrate survey data within the Study Area was available for 33 of the 38 WFD waterbody defined catchments crossed by the Project. None of the species identified in the desk study are protected under conservation legislation. Nine of the catchments were assessed by the Environment Agency to support macroinvertebrate populations indicative of *'high'* water quality and so of national importance, which comprise:

- Section A: the Tas (Tasburgh to River Yare) and the Tributary of the Tas
- Section B: the Little Ouse (upstream of Thelnetham), the Wattisham Watercourse
- Sections C and D: the Stour downstream of River Brett
- Section E: the Blackwater (Combined Essex)
- Sections E and F: the Ter
- Section F: the Chelmer (Great Easton to River Can) and Roxwell Brook.

8.5.31 Fifteen of the catchments were assessed by the Environment Agency to support macroinvertebrate populations indicative of *'good'* water quality and so of county importance and medium value, which comprise:

- Section A: the Tas (Head to Tasburgh)

- Sections A and B: the Waveney upstream of Frenze Beck
- Section B: the Tributary of the Upper Waveney, the Dove Tributary to Finningham, the Mendlesham Stream, the River Gipping (upstream of Stowmarket), and the River Gipping (downstream of Stowmarket)
- Sections B and C: Belstead Brook
- Section C: the River Brett and Stutton Brook
- Section D: the Stour (Lamarsh to the River Brett), the River Colne (downstream Doe's Corner) and Roman River
- Section E: the River Brain
- Section F: the River Wid (Margaretting Hall the River Can).

8.5.32 Six of the catchments were assessed by the Environment Agency to support macroinvertebrate populations indicative of *'moderate'* water quality and so of county importance and medium value, which comprise:

- Section C: the Tenpenny Brook
- Section F: the Chignall Brook, and the River Can
- Section G: the River Wid (Shenfield STW - Ingatestone Hall), Haverings Grove Brook, and the River Crouch (Upper) – Upstream A129.

8.5.33 It is assumed that all other watercourses within the Order Limits support aquatic macroinvertebrate species that are common and widespread in East Anglia. There is the low risk that Species of Principal Importance (NERC Act 2006) and red listed species may be present, therefore the population is also assessed to be of medium value and county importance on a precautionary basis.

8.5.34 The desk study identified two invasive invertebrate species: demon shrimp and signal crayfish. Demon shrimp is an invasive freshwater amphipod, recorded on the River Chelmer downstream of Chelmsford. The sites where demon shrimp have been recorded are outside the Study Area. However, the Chelmer is connected to several watercourses found within the Order Limits, notably the River Blackwater (Section E) and the River Can (Section F) and their associated tributaries. As such, their presence on these rivers cannot be ruled out. Signal crayfish was recorded throughout the Study Area, and on several watercourses within the wider area, notably the River Tas (Section A), River Gipping (Section B), River Colne (Section D), River Blackwater (Section D), River Wid (Section G), and the Roxwell Brook (Section F). Due to the widespread extent of this species, it is potentially present on all watercourses within the Order Limits. Further details are set out in Appendix 8.4: Aquatic Report (document reference 6.8.A4) and shown on Figure A8.4.1: Aquatic Ecology Baseline within the same appendix.

8.5.35 Signal crayfish have been recorded throughout the Study Area. This species is a threat to native, white-clawed crayfish populations as they are in direct competition with the smaller native crayfish and carry a disease that is fatal to native species. No records for native crayfish were revealed by the desk study and no individuals recorded during field surveys. A viable population of native crayfish is likely absent from the Study Area and for this reason white-clawed crayfish have not been considered further. Although the invasive species are not of conservation value, they are a threat to biodiversity.

Terrestrial Invertebrates

8.5.36 An assessment of terrestrial invertebrate habitat suitability was undertaken across the Order Limits to determine potential locations where an important terrestrial invertebrate assemblage may be present. Full details of the terrestrial invertebrate desk study and surveys can be found in Appendix 8.5: Terrestrial Invertebrate Report (document reference 6.8.A5).

8.5.37 36 ISAs were confirmed following the initial desk study which are all shown on Figure A8.5.1: Terrestrial Invertebrate Survey Locations within Appendix 8.5: Terrestrial Invertebrate Report (document reference 6.8.A5). These were then subjected to an invertebrate habitat potential assessment, with reference to the (as yet unpublished) Invertebrate Habitat Potential Protocol (Dobson and Fairclough, unpublished). This identified three sites where further survey was required.

8.5.38 The invertebrate fauna of three sites was sampled with subsequent identification of material and analysis of the results using the Pantheon analytical tool developed by Natural England and the Centre for Ecology and Hydrology (2018).

- ISA 4 - Land north of Ling Road, Diss, Norfolk (Section A)
- ISA 24 - Land east of Nightingale Hill, Langham, Essex (Section C)
- ISA 29 - Land west of Cressing Road, Witham, Essex (Section E).

8.5.39 The targeted sampling at ISA 4, ISA 24 and ISA 29 identified 148, 166 and 144 invertebrate species respectively as shown in Table 8.10. The Pantheon tool identified invertebrate species with a conservation status at all three sites, with ISA 24 being the site with the most species associated with having a scarce or rarity status.

Table 8.10 Terrestrial invertebrate key areas

ISA Number	ISA 4 (Land north of Ling Road, Diss, Norfolk) (Section A)	ISA 24 (Land east of Nightingale Hill, Langham, Essex) (Section C)	ISA 29 (Land west of Cressing Road, Witham, Essex) (Section E)
Total no. of species	148	166	144
Total no. of species with a UK conservation status[6]	7 (2 NS, 3 Nb, 1 RDB3 and 1 RDB2)	13 (1 NS, 5 Na, 5 Nb, 1 RDB3, 1 VU)	4 (3 Na, 1 Nb)
S41 Priority Species (NERC Act 2006)	2 (1 for research only)	2 (1 for research only)	1 (1 for research only)

[6] RDB2: Red Data Book 2 (JNCC) - species appear in the Red Data Book and are categorised as vulnerable; RDB3: Red Data Book 3 (JNCC) - species appear in the Red Data Book and are categorised as rare; NS: Nationally Scarce (GB Rarity Status) - native species that are not regarded as Nationally Rare and which have not been recorded (as resident breeding species) from more than 100 hectads of the GB Ordnance Survey national grid in the period 2000-2014 and where there is reasonable confidence that exhaustive recording would not find them in more than 100 hectares; Na: Nationally Scarce A (JNCC) - species are nationally scarce and have been recorded in 16-30 hectads in Great Britain; Nb: Nationally Scarce B (JNCC) - species are nationally scarce and have been recorded in 31-100 hectads in Great Britain; VU: Vulnerable (IUCB) - A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable.

ISA Number	ISA 4 (Land north of Ling Road, Diss, Norfolk) (Section A)	ISA 24 (Land east of Nightingale Hill, Langham, Essex) (Section C)	ISA 29 (Land west of Cressing Road, Witham, Essex) (Section E)
Best represented - Broad Biotope	Open habitats	Open habitats	Open habitats
Best represented - Habitat	Tall sward and scrub	Tall sward and scrub	Tall sward and scrub
Best represented – Specific Assemblage Type	Scrub edge (Unfavourable - reported condition)	Rich flower resource (Favourable - reported condition)	Scrub edge (Unfavourable - reported condition)
Assessment value	**Low/Local**	**Medium/County**	**Low/Local**

Fish

8.5.40 A desk study identified that the Order Limits span 38 WFD river catchments. A total of 199 river crossings where in-channel works may take place have been identified. The results of the desk study and field survey are presented in Appendix 8.4: Aquatic Report (document reference 6.8.A4) and are summarised in the paragraphs that follow.

8.5.41 The desk study and field surveys revealed that the watercourses that have the potential to be affected by the Project support the following fish species of conservation concern:

- Brown trout
- European eel
- Brook lamprey and river lamprey
- Spined loach
- Bullhead

8.5.42 Although no suitable spawning habitat was identified within the Order Limits, at least one of these species has been recorded in watercourses in all Project Sections (i.e., Sections A to H) and it is likely that suitable spawning habitat is present elsewhere in the river catchments. Table 8.11 combines the result of the desk study and field survey to assign a value to the watercourse catchments with respect to the fish populations that they support.

Table 8.11 WFD catchments and their value to fish

Project Section (s)	Watercourse Catchment	Environment Agency Fish Value	Fish Species of Conservation Concern	Value/Importance
A	Tas (Tasburgh to R. Yare)	Moderate	Brown trout, brook lamprey, bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County
A	Tributary of Tas	Moderate	Brown trout, bullhead, European eel	Medium – County
A	Tas (Head to Tasburgh)	Moderate	Bullhead	Medium – County
A	Frenze Beck	No Environment Agency Value	-	Low - Local
A, B	Waveney (u/s Frenze Beck)	No Environment Agency Value	Migratory coarse fish (dace and chub)	Low - Local
B	Tributary of Upper Waveney	No Environment Agency Value	-	Low - Local
B	Little Ouse (US Thelnetham)	Bad	Bullhead	Medium – County
B	Dove trib - Finningham	No Environment Agency Value	European eel	Low - Local
B	Mendlesham Stream	No Environment Agency Value	-	Low - Local
B	Gipping (u/s Stowmarket)	No Environment Agency Value	European eel, migratory coarse fish (dace, roach and chub)	Low - Local
B	Gipping (d/s Stowmarket)	High	Bullhead, European eel migratory coarse fish (dace and chub)	Medium – County
B	Wattisham Watercourse	No Environment Agency Value	Bullhead, European eel	Medium – County
B	Somersham Watercourse	No Environment Agency Value	-	Low - Local

Project Section (s)	Watercourse Catchment	Environment Agency Fish Value	Fish Species of Conservation Concern	Value/Importance
B, C	Belstead Brook	Poor	Brown trout	Medium – County
C	Brett	Good	Lamprey, bullhead European eel, spined loach	Medium – County
C	Coastal Catchment (Stour)	-	-	-
C	Stutton Brook	Poor	Brown trout, European eel	Medium – County
C	Tenpenny Brook	Poor	-	Low- local
C, D	Stour (d/s R. Brett)	High	Book lamprey, Lamprey ammocoetes, Bullhead, European eel, spined loach migratory coarse fish (dace and chub)	Medium – County
C, D	Salary Brook	Poor	Brown trout, bullhead, European eel, migratory coarse fish (dace)	Medium – County
D	Stour (Lamarsh - R. Brett)	High	Brown trout, brook lamprey, Lamprey ammocoetes, Bullhead, European eel, spined loach migratory coarse fish (dace and chub)	Medium – County
D	Colne (d/s Doe's Corner)	Good	Bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County

Project Section (s)	Watercourse Catchment	Environment Agency Fish Value	Fish Species of Conservation Concern	Value/Importance
D	Roman River	Moderate	Brown trout bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County
E	Blackwater (Combined Essex)	High	Brown trout, brook lamprey, bullhead European eel	Medium – County
E	Brain	No Environment Agency Value	Brook lamprey, Bullhead	Medium – County
E, F	Ter	No Environment Agency Value	Brook lamprey, bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County
F	Chelmer (Gt. Easton - R. Can)	Good	Brown trout, brook lamprey, lamprey ammocoetes, bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County
F	Chignall Brook	No Environment Agency Value	-	Low- Local
F	Can	Good	Brook lamprey, bullhead, European eel, migratory coarse fish (dace and chub)	Medium – County
F	Roxwell Brook	Poor	Bullhead, migratory coarse fish (dace and chub)	Medium – County
F	Wid (Margaretting Hall - R. Can)	No Environment Agency Value	Migratory coarse fish (dace and chub)	Low- Local

Project Section (s)	Watercourse Catchment	Environment Agency Fish Value	Fish Species of Conservation Concern	Value/Importance
F and G	Wid (Ingatestone Hall - Margaretting Hall)	No Environment Agency Value	Bullhead, migratory coarse fish (dace and chub)	Medium – County
G	Wid (Shenfield STW - Ingatestone Hall)	High	Bullhead, migratory coarse fish (dace and chub)	Medium – County
G	Haverings Grove Brook	No Environment Agency Value	Bullhead	Medium – County
G	Crouch (Upper) – Upstream (u/s) A129	No Environment Agency Value	-	Low- Local
H	Mardyke (East Tributary)	High	-	Low- Local
H	Mardyke	Moderate	European eel	Medium – County
H	Coastal Catchment (Thames)	-	-	

Reptiles

8.5.43 It is assumed that common reptile species are present and widespread throughout the Order Limits due to the presence of suitable habitat and because their distribution throughout East Anglia is widely documented. Common reptile species in East Anglia comprise grass snake, common lizard and slow-worm with adder having a more limited distribution.

8.5.44 Desk study and field surveys were undertaken, details of which are set out within Appendix 8.6: Reptile Report (document reference 6.8.A6).

8.5.45 Five potential KRS were subject to targeted surveys with three found to meet the criteria to be a KRS as defined by Froglife (1999). These are shown on Figure A8.6.2: Reptile Survey Locations within Appendix 8.6: Reptile Report (document reference 6.8.A6) and comprise the following:

- Sproughton Park (Section C) – supported grass snake, slow-worm and common lizard
- River Wid Corridor (Section G) – supported adder, grass snake, slow-worm and common lizard
- Orsett Golf Course potential LWS (Section H) - supported adder, grass snake, slow-worm and common lizard.

8.5.46 These three confirmed KRS are of medium value to reptiles supporting populations of county importance.

8.5.47 A further 51 potential KRS were identified within the Order Limits based on a review of habitat suitability and desk study data. In addition, based on desk study records common reptile species are likely to be present in suitable habitat in low numbers throughout the Order Limits.

8.5.48 All other areas of habitat within the Order Limits and not within the confirmed or potential KRS are of a negligible value to reptiles supporting populations of, at most, site level importance.

Breeding Birds

8.5.49 The Study Area contains habitats that are potentially suitable for a range of breeding bird species, which may be present within the semi-natural habitats within the Order Limits.

8.5.50 An initial desk-based study was undertaken to identify suitable habitat within the Order Limits that may support notable breeding bird species. Notable is defined as birds listed under Schedule 1 of the WCA 1981 (hereafter referred to as *'Schedule 1 species'*) and those listed as red or amber in the Birds of Conservation Concern 5 (Stanbury *et al.*, 2021). Results of this are included within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7).

8.5.51 Nine locations were identified and subject to six surveys, comprising walked transects in line with Bird Survey Guidelines (Bird Survey and Assessment Steering Group, 2025). The bird survey locations are set out in Table 8.12 and shown on Figure A8.7.1: Breeding Bird Survey Areas within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7).

Table 8.12 Bird survey locations

Bird Survey Location	Location	Project Section(s)	Year of Survey
1	Diss	A, B	2024
2	Needham Market	B	2024
3	Burstall	B, C	2024
4	Raydon	C	2024
5	Stratford St Mary	C	2023
6	Ardleigh	C	2024
7	Great Horkesley	D	2024
8	Glebe Farm	C	2025
9	Tilbury North	H	2025

8.5.52 The presence of breeding birds and raptor species as well as suitable features to support barn owl were identified consistently across the Order Limits (within all Project Sections), utilising a range of suitable habitats across the landscape. When determining the overall value of a breeding bird assemblage, the most appropriate guidance is from Fuller (1980), adapted to incorporate District level importance to accord with the levels in the CIEEM EcIA Guidelines (CIEEM, 2018). Table 8.13 outlines the number of breeding species that correspond with the level of importance of a site for breeding birds.

Table 8.13 Assessment of breeding bird species

Level of Importance	Number of Breeding Species	
	Fuller (1980)	Adapted Criteria
National	85+	85+
Regional	70-84	70-84
County	50-69	50-69
District	-	25-49
Site / Local	25-49	<25

8.5.53 Given the large-scale nature of the Project, the above categories have been applied at the level of the bird survey locations (identified for survey). Where the bird survey locations have been noted as supporting rarer birds in a geographical context, this has been considered when determining the level of importance/value for breeding birds. The importance/value of each bird survey location is set out in Table 8.14. Surveys in the vicinity of Boxted (Survey Area 8) and the new Tilbury North Substation (Survey Area 9) are to be completed in 2025. Based on the desk study records and habitats present it is considered likely that only common and widespread farmland bird species will be identified in these areas. However, this baseline report assumes a reasonable worst-case scenario and has assigned medium value / county importance to the breeding bird assemblage for both Survey Areas. The results of the breeding bird surveys undertaken post March 2025 will be included in a further environmental information report (see Table 8.4).

Table 8.14 Ecological value of bird survey locations

Bird Survey Location	Location	Project Section(s)	Number of Breeding Species	Value	Importance
1	Diss	A, B	48	Low	District
2	Needham Market	B	47	Low	District
3	Burstall	B, C	42	Low	District
4	Raydon	C	53	Medium	County
5	Stratford St Mary	C	61	Medium	County

Bird Survey Location	Location	Project Section(s)	Number of Breeding Species	Value	Importance
6	Ardleigh	C	52	Medium	County
7	Great Horkesley	D	51	Medium	County
8	Boxted	C	Unknown	Medium	County
9	Tilbury North	H	Unknown	Medium	County
General breeding bird population (not including the above sites).		A to H	Unknown	Low	Local

8.5.54 A small area within Bird Survey Location 2, referred to as *'Gibbon's Farm and Ash Covert'* (located approximately 2 km south-west of Needham Market), contained a watercourse and a diverse range of habitats, including woodland, scrub and grassland. This area supported a breeding bird assemblage of county importance and medium value due to the presence of possible breeding lesser spotted woodpecker along with other rare, declining breeding bird species (red listed) including nightingale and marsh tit.

8.5.55 Several Schedule 1 species have been recorded within the Order Limits:

- 35 potential or confirmed barn owl roosting sites or features, as shown on Figure A8.7.14: Barn Owl Constraints Map within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7)
- One confirmed breeding hobby was identified adjacent to the proposed Tilbury North Substation, as shown on Figure A8.7.16: Hobby Constraints Map within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7)
- Two potential kingfisher nesting sites were identified, as shown on Figure A8.7.17: Kingfisher Constraints Map within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7)
- Three red kite territories were identified, as shown on Figure A8.7.20: Red Kite Constraints Map within Appendix 8.7: Breeding Bird Report (document reference 6.8.A7).

Wintering/Passage Birds

8.5.56 A desk study was undertaken for wintering/passage birds which included a review of existing data available online and those obtained from local record centres. The desk study identified 27 sites (either SPA or Ramsar Sites of ornithological importance) within 20 km of the Order Limits (as shown on Figure A8.8.2: International and National Designated Sites of Ornithological Importance within Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8)). Several non-statutory designated sites including CWSs and LWSs are present within 2 km of the

Order Limits and list birds on their site description; none list wintering birds or birds on passage as a reason for designation.

8.5.57 Vantage point (VP) surveys have been completed where overhead lines are proposed to cross watercourses and water bodies across the Project. The purpose of this was to collate bird flight details along these locations which may be used as commuting routes by water birds and assess their collision risk (water birds are thought to be of particular collision concern due to poor manoeuvrability in flight). A VP at Ardleigh Reservoir was within 5 km of the Stour and Orwell Estuaries SPA and Ramsar Site, and as such was of particular importance to assess effects on qualifying bird species of these European sites.

8.5.58 Transects of large open fields to identify birds associated with the Stour and Orwell Estuaries Ramsar Site and SPA were also undertaken. The scope for wintering/passage bird surveys which sets out the methodology and results is provided in Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8). The report provides baseline for two assessments: the Ecological Impact Assessment (as undertaken in this report) and the HRA (document reference 5.3).

8.5.59 No specific surveys for wintering farmland birds have been undertaken as they are not considered to be at risk of collision and not designated features of the SPA and Ramsar Sites.

8.5.60 As part of the HRA (document reference 5.3), surveys were undertaken to determine the presence of FLL associated with the Stour and Orwell Estuaries Ramsar Site and SPA. The wetland habitat surrounding the River Stour within the Order Limits is hydrologically connected to the Stour and Orwell Estuaries SPA and Ramsar Site that provides a natural corridor for those qualifying avian features to move along.

8.5.61 22 survey locations comprising vantage points or transects were identified based on the habitat selection criteria and listed in Table 8.15. These survey locations are presented in Figure A8.8.1: Wintering/Passage Bird Survey Locations within Appendix 8.8: Wintering and Passage Bird Report (document reference 6.8.A8).

Table 8.15 Wintering bird survey locations

Survey Type	Bird Survey Location	Location	Project Section (s)
Vantage Point	1	Toprow and Flordon	A
Vantage Point	2	Bunwell Fen to Carleton Fen	A
Vantage Point	3	River Waveney – Little Ouse Corridor	A and B
Vantage Point	4	River adj. Wickham Road	B
Vantage Point	5	River adj. Wickham Road	B
Vantage Point	6	A1071 to Pigeon's Lane	C
Transect	7	Land North of B1068	C
Transect	8	Land North of River Stour	C
Vantage Point / Transect	9	River Stour	C

Survey Type	Bird Survey Location	Location	Project Section (s)
Transect	10	A12 to Burnt Heath	C
Vantage Point	11	Ardleigh Reservoir	C
Vantage Point	12	River Colne	D
Vantage Point	13	River Blackwater	E
Vantage Point	14	Silver End to Rivenhall	E
Vantage Point	15	River Brain	E
Vantage Point	16	River Ter	F
Vantage Point	17	River Chelmer	F
Vantage Point	18	River Wid	G
Vantage Point	19	Southfields	H
Vantage Point	20	Linford	H
Vantage Point	21	East Tilbury	H
Vantage Point	22	Tilbury	H

8.5.62 In terms of the transect surveys, a total of 34 wetland species were identified (combined with VP results). The transects targeted suitable habitat within the Impact Risk Zones associated with the Stour and Orwell Estuaries SPA. Two Qualifying Species of the SPA were recorded during the survey work: black-tailed godwit and dark-bellied brent goose. A single record of four black-tailed godwit was made at Survey Location 9 (River Stour, Section C). Dark-bellied brent goose was recorded at Survey Location 10 (A12 to Burnt Heath, Section C) and Survey Location 11 (Ardleigh Reservoir, Section C) on single occasions, with eight birds and one bird recorded at each location respectively.

8.5.63 Assemblage Species included cormorant, curlew, gadwall, golden plover, great crested grebe, lapwing, shelduck and wigeon. Most of these records were at Survey Location 10 (A12 to Burnt Heath, Section C) and to a lesser extent, Survey Locations 7, 8, 9 and 11 (Land North of B1068, Land North of River Stour, River Stour and Ardleigh Reservoir, all in Section C). Survey Location 10 (A12 to Burnt Heath, Section C) did cover a large area of mainly arable land with a fishing lake.

8.5.64 The transect surveys identified two key wetland areas for birds which supported wintering bird assemblages of county importance. As such they were of medium value:

- Survey Location 9 – River Stour (Langham Lake only - Section C) with flooded areas, grassland and large arable fields in the vicinity
- Survey Location 11 – Ardleigh Reservoir (Section C).

Bats - General

8.5.65 Survey effort for bats comprised bat roosting surveys, bat activity surveys and radio-tracking surveys. The baseline sets out the scope of these bat surveys in line with good practice guidance (Collins, 2023) which includes the methodology for the desk study, field work and the results. The scope of survey for bats was agreed with Natural England.

8.5.66 The existing baseline for bats is detailed within the following:

- Appendix 8.9: Bat Roost Report (document reference 6.8.A9)
- Appendix 8.10: Bat Activity Report (document reference 6.8.A10)
- Appendix 8.11: Bat Radio-Tracking Report (document reference 6.8.A11).

8.5.67 One SSSI (Hangman's Wood and Deneholes, Section H) designated for bats was identified within the Study Area, approximately 0.49 km south of the Order Limits, as shown on Figure A8.16.2: Statutory Designated Sites for Biodiversity within Appendix 8.16: Designated Sites Report (document reference 6.8.A16). The site is known for its medieval chalk mines that provide important underground hibernation sites for brown long-eared bat, Natterer's bat and Daubenton's bat, with the woodland providing foraging and commuting habitat. A further six non-statutory sites where bats are mentioned in the description, were also located within the Study Area. These are shown on Figure A8.9.2: Desk Study Bat Records within Appendix 8.9: Bat Roost Report (document reference 6.8.A9).

8.5.68 Following the completion of the desk study and field surveys undertaken between 2023 and 2025 the following bats have been identified within the Study Area:

- Barbastelle bat
- Common pipistrelle
- Soprano pipistrelle
- Nathusius's pipistrelle
- *Myotis* species
- Noctule
- *Nyctalus* species
- Brown long-eared
- Serotine.

Foraging and Commuting Bats

8.5.69 Static detector surveys were undertaken and analysed in line with good practice guidelines. Activity levels were measured as *'passes per hour'*.

8.5.70 The assessment of spatial variation in overall bat activity showed that barbastelle, *Nyctalus* spp., serotine, common pipistrelle, soprano pipistrelle, Nathusius's pipistrelle, *Myotis* spp. and brown long-eared bat were recorded consistently across the Order Limits with no significant difference for each species found in bat activity levels between locations.

8.5.71 When bat activity for each species was compared over the months a significant difference was found for each species suggesting that the importance of the habitats within the Order Limits varies through the bat active season.

8.5.72 The exception to this was soprano pipistrelle. Soprano pipistrelle activity did not significantly vary over the months suggesting that the importance of the habitats within the Order Limits does not vary across the bat active season for soprano pipistrelle.

8.5.73 Barbastelle had significantly higher levels of activity in September. This is when bats begin to mate and swarm. Additionally, the static detector data indicate differences between Project Sections in levels of barbastelle activity in each survey month. Section C had the highest levels of barbastelle activity in September suggesting that the habitats in Section C may be higher in quality or provide better suitability for mating and swarming barbastelle.

8.5.74 *Nyctalus* spp., serotine, common pipistrelle, Nathusius's pipistrelle and brown long-eared bat had significantly higher levels of activity in May. *Myotis* spp. had significantly higher levels of activity in July. These months are the core maternity months when pups are born and begin to fly independently suggesting there is habitat within the Order Limits that supports breeding bat populations of these species. Additionally, the data indicates variation in activity between seasons for some of these species suggesting that the habitats in some Project Sections may be better in quality or more abundant and support maternity colonies. The following Project Sections had significantly higher levels of activity for the following species:

- *Nyctalus* spp. (Section C / Section E)
- Serotine (Section E)
- *Myotis* spp. (Section C).

Assessment of Bat Assemblage

8.5.75 56 locations, as shown on Figure A8.10.1: Bat Static Deployment 2023-2025 and detailed within Appendix 8.10: Bat Activity Report (document reference 6.8.A10), met the criteria for a bat assemblage of national importance and therefore of high value; six locations were of regional importance and two of county importance (both medium value) in line with UK Bat Mitigation Guidelines (Reason and Wray, 2023). When considering the importance as set out in Table 8.5 this translates to a bat assemblage of medium to high value.

8.5.76 Bat static surveys for the nine additional static detector locations (65-73) will be undertaken over the 2025 season. Based on desk study records and the habitats present, it is considered likely that bat activity for each of the above bat species groups is likely to be low to moderate activity in line with the majority of other locations surveyed. However, this baseline report assumes a reasonable worst-case scenario of high activity for one or multiple species groups, including barbastelle, at all nine locations. There would be no change to the overall value of medium-high value/County-National importance assigned to bat assemblage.

8.5.77 The results of the bat static detector surveys undertaken post-March 2025 will be included in a further environmental information report (see Table 8.4).

Activity Patterns from Radio-Tracking

8.5.78 Most of the radio-tagged bats spent time foraging and commuting within the woodland, to a greater or lesser extent, at either the Coombs or the Glebe Reservoir, or both (all Section C). None of the bats foraged exclusively within these areas, as each were absent from the survey area at stages throughout the radio-tracking survey periods (typically up to four hours after sunset), i.e., the woodland probably represents only a portion of the total foraging areas for these bats.

8.5.79 Many of the foraging fixes recorded within the survey area were from bats within an hour following emergence, before ambient light levels fell sufficiently for bats to commute further away to other foraging areas. A composite of key commuting areas and flight lines for all bats combined is shown on Figure A8.11.10: Bat Radio-Tracking – Commuting Flightlines within Appendix 8.11: Bat Radio-Tracking Report (document reference 6.8.A11).

Roosting Bats

8.5.80 Between November 2023 and end of March 2025, approximately 4,562 trees, within the Survey Area were individually assessed for the presence of potential roost features. A further 3,000 (approx.) trees were also subject to GLTA surveys but have since been excluded from this assessment as they are no longer located within the Order Limits following design changes. No structures were surveyed for bats as none are proposed to be affected by the Project.

8.5.81 While surveys were successfully completed for 87.5% of the Order Limits, further GLTAs will be undertaken over the 2025 season, for the purpose of the Environmental Statement a reasonable worst-case scenario for the results of these surveys has been assumed. The reasonable worst-case position has been based on professional judgement following a review of bat species records obtained from the desk study, the results of the GLTA surveys undertaken across the rest of the Project and the mapping of trees/woodland habitat from aerial imagery.

8.5.82 All trees with the potential to support bat features are shown on Figure A8.9.1: Ground Level Tree Assessment Results 2024 and 2025 within Appendix 8.9: Bat Roost Report (document reference 6.8.A9). Of the 4,562 trees assessed within the Order Limits, a total of 287 trees were assessed as containing at least one potential roost feature suitable for multiple bats and may therefore be used by a maternity colony (PRF-M). A total of 1,773 trees were assessed as Further Assessment Required (FAR) and a total of 587 trees were assessed as having features only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitat (PRF-I).

8.5.83 There were also 41 trees were also identified as having hibernation potential for bats.

8.5.84 Across 2023, 2024 and March 2025, 62 trees were further surveyed from ground level torch and endoscope to confirm their status as either PRF-I (45 trees) or PRF-M (17 trees).

8.5.85 Based on the desk study information, tree assessment and radio-tracking work (see sections below), roosting bats are assessed to be of low to medium value, i.e. the trees support a bat population of local to county importance.

8.5.86 Further GLTA surveys are to be undertaken in 2025, and it is reasonable to assume a similar number of trees with potential bat roosting features would be identified across the remaining land parcels, given the makeup of the habitat present. On this

basis a precautionary reasonable worst-case scenario has been applied for the purpose of the ES (Volume 6 of the DCO application), with the same percentage of PRF trees per hectare applied to the remaining 12.5%, as was found within the surveys undertaken across the rest of the Project. Therefore, a total of 314 additional PRF-M/FAR trees, 86 PRF-I and 6 trees with hibernation potential have been included within the baseline on a precautionary basis. There would be no change to the overall value of low-medium assigned to roost resource.

8.5.87 The results of the GLTA's undertaken post-March 2025, will be included in a further environmental information report (see Table 8.4).

Roosting barbastelle

8.5.88 There were 13 static detector locations where four or more barbastelle passes were recorded within 60 minutes of sunset. These locations are listed in Table 8.16 and shown on Figure A8.10.1: Bat Static Deployment 2023-2025 within Appendix 8.10: Bat Activity Report (document reference 6.8.A10). This indicates that a barbastelle roost may be within or close to the Order Limits.

Table 8.16 Locations where four or more barbastelle passes were recorded within 60 minutes of sunset

Project Section	Location	Date	Number of Passes within 60 mins of Sunset
A	5	05 May 2024	4
		06 May 2024	8
A	7	11 May 2024	5
		08 August 2024	5
		09 August 2024	4
A	8	09 May 2024	11
		10 May 2024	6
		12 May 2024	8
A	14	10 August 2024	4
B	16	08 August 2024	7
B	20	28 May 2024	10
B	24	01 May 2024	4
		04 September 2024	4
B	26	02 May 2024	6
C	37	05 September 2023	4
		07 September 2023	4
		08 September 2023	4

Project Section	Location	Date	Number of Passes within 60 mins of Sunset
		18 May 2024	8
		20 May 2024	4
C	38	22 July 2023	6
		20 September 2023	9
		21 September 2024	11
		22 September 2023	21
		23 September 2023	14
		24 September 2023	5
C	39	24 May 2024	7
D	50	04 September 2024	7
		05 September 2024	4
F	62	30 July 2024	4

8.5.89 Radio-tracking surveys were conducted at the Coombs (location 37 in Section C) and Glebe Reservoir (location 39, Section C). These locations are shown on Figure A8.11.1: Bat Radio-Tracking – Survey Locations within Appendix 8.11: Bat Radio-Tracking Report (document reference 6.8.A11). Static detector location 38 (Section C) was situated between these two radio-tracking locations. The radio-tracking surveys confirmed the presence of barbastelle roosts in proximity to these locations.

Hazel Dormouse

8.5.90 A desk study was undertaken that identified the presence of hazel dormouse across the southern half of the Order Limits, in line with known UK distribution of hazel dormouse. Hazel dormouse is absent from Norfolk in habitats affected by the Project. A review of potential impact pathways was undertaken to establish the need for targeted surveys at key locations based on a robust desk study where further information was needed to inform impact assessment. Further details regarding the approach, methodology and results of hazel dormouse surveys are set out in Appendix 8.12: Hazel Dormouse Report (document reference 6.8.A12).

8.5.91 Optimal habitat for hazel dormouse is broadleaved woodland connected by networks of hedgerows. Small areas of this habitat were located within the Order Limits in both Suffolk and Essex.

8.5.92 When assessing potential impact pathways to determine survey locations, habitat suitability was assessed based on factors identified as offering *'increased probability'* to support hazel dormouse as per the Dormouse Conservation Handbook (English Nature, 2006). 25 hazel dormouse survey areas were surveyed in 2023 and 2024 in line with good practice to determine presence or likely absence of hazel dormouse. These locations are shown on Figure A8.12.1: Dormouse Desk Study Records,

survey areas and Positive Results within Appendix 8.12: Hazel Dormouse Report (document reference 6.8.A12).

8.5.93 Table 8.17 identifies the eight locations where hazel dormouse was confirmed to be present, hazel dormouse are therefore considered to be absent from all other survey locations. The data correlates with the known distribution of hazel dormouse. They are a species of conservation value and of county level importance. Populations of hazel dormouse are of medium value.

Table 8.17 Hazel dormouse survey locations

Hazel Dormouse Survey Location	Location	Project Section	Evidence of Presence
1	Great Newton Wood, Lodgefield Row and Ash Covert, Needham Market	B	Dormouse nest
2	Lower Wood, Barking	B	Dormouse nest
25	Big Wood and Whitmore Wood, Burgate	B	Dormouse nest
18	King Wood, Margaretting	F	Dormouse nest
19	Bosmore Wood, Margaretting	F	Dormouse nest
20	Bushy Wood and Osborne's Wood, Margaretting	F	Dormouse nest
21	Harespring Wood, Mountnessing	G	Dormouse sighting and nest
22	River Wid, Mountnessing (area no longer within the Order Limits but connected to hedgerows within the Order Limits via woodland)	G	Dormouse nest

Otter

8.5.94 An otter desk study and field survey has been undertaken across the Order Limits to establish the otter baseline. Local record centre data was obtained within 2 km of the Order Limits for any evidence of otter from the last 10 years. Further details regarding the approach, methodology and results of otter surveys are set out in Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13).

8.5.95 A review of designated sites was also undertaken within 2 km of the Order Limits (extended to 10 km for SACs) to establish the existing use of sites by otter that may be affected. The desk study also included a review of all watercourses that may be used by otter and associated riparian habitat (the data of which was obtained through UKHab surveys) to establish the survey area.

8.5.96 Otter is a common and widespread species present throughout East Anglia, and it is assumed that they would use both wet and dry watercourses when travelling across a range (territory). Results obtained from the desk study indicated otter presence in Norfolk, Suffolk and Essex. All records with precise locations were concentrated in

Project Sections A, B, C and D with Project Section C yielding the highest concentrations.

8.5.97 Within the Order Limits, 555 potential watercourses were identified through a desk study that would be directly affected by either haul road crossings, underground cabling, and/or drainage outflow locations (see Appendix 4.2: Watercourse Crossing Details (document reference 6.4.A2)). These were subject to a further review which reduced this number down to 204 watercourses that may have suitability for otter and therefore need to be surveyed.

8.5.98 142 of the 204 watercourses as suitable otter / water vole habitat were surveyed in 2023 and 2024. Further survey work will be undertaken in 2025 which includes a second visit of 10 watercourses and two-visits of 62 (new) watercourses. Of the 142 surveyed watercourses, 27 had confirmed presence of otter due to sightings or the presence of confirmed otter holts/resting sites, spraint or footprints. A further four watercourses were assigned potential otter presence due to indicative signs such as potential otter feeding remains, footprints, slides, couches and nearby sightings. Table 8.18 provides a summary of watercourses with otter presence by Project Section. Figure A8.13.2: Otter Field Survey Results within Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13) shows the location of these watercourses.

8.5.99 Given the size and scale of the Project, otter surveys will continue in 2025 for completeness. This report includes data obtained up to the end of March 2025 and covers approximately 65% of affected watercourses, surveys conducted beyond the end of March 2025 will be included in a further information report (see Table 8.4). For the purpose of this Environmental Statement a reasonable worst-case scenario for the results of these surveys for otter has been assumed, based on records obtained from desk study, the results of the otter surveys across the rest of the Project and the type of watercourses present in and around the Order Limits. It is reasonable to assume a similar number of confirmed or potential otter field signs would be identified across the remaining watercourses, given the type and location of the watercourses present. On this basis a precautionary reasonable worst-case scenario has been applied for the purpose of the ES (Volume 6 of the DCO application), with the same percentage of positive otter records applied to the remaining watercourses, as was found within the surveys undertaken across the rest of the Project (23%). Therefore, it is considered reasonable to assume that 14 additional watercourses will have confirmed or potential evidence of otter identified during the 2025 surveys.

8.5.100 Figure A8.13.2: Otter Field Survey Results within Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13) shows the location of potential or confirmed resting sites identified during survey. Label '*O9*' shows the location of a resting site in a small copse in Project Section E; this resting site was not directly connected to a watercourse. Label '*O11*' shows the location of a holt / resting site on the bank of watercourse 98 (Havering's Grove Brook, Section G), and label '*O10*' shows the location of a holt / resting site on the bank of watercourse 78 (River Can, Section F). A further eight features with suitability to be used as a holt or resting site were recorded at:

- O1 on watercourse ID 16 (Frenze Beck, Section A)
- O2 on watercourse ID 32 (Wattisham Watercourse, Section B)
- O3 on watercourse ID 139 (Belstead Brook, Section C)
- O4 on watercourse ID 140 (Spring Brook, Section C)

- O5 on watercourse ID 145 (Tributary of River Brett, Section C)
- O6 on watercourse ID 331 (Tributary of Salary Brook 1, Section C) (feature no longer affected by the Project)
- O7 on watercourse ID 183 (River Colne, Section D)
- O8 on watercourse ID 62 (River Blackwater, Section E).

8.5.101 It should be noted that otter is a highly mobile species. The usage of otter holts and resting sites varies across the seasons and across the years and so pre-construction surveys, to include the use of cameras for monitoring, would be required to confirm the status and location of any resting sites. Otter is a species of conservation value, and a natal holt would be of county level importance and of medium value.

Table 8.18 Summary of watercourses with otter presence by Project Section

Project Section	Watercourse ID	
	Otter Confirmed Presence (Watercourse ID Number and Name if Applicable)	Potential Otter Field Signs
A	16 (Frenze Beck), 118 (unnamed watercourse), 120 (River Tas), 124 (Tributary of River Waveney 1), 126 (River Waveney), 182 (Tributary of River Tas 2)	N/A
A and B	125 (River Waveney)	N/A
B	32 (Wattisham Watercourse)	N/A
C	41(a) and 42 (River Stour), 45 (Black Brook), 139 (Belstead Brook), 140 (Spring Brook), 151 (unnamed watercourse	Potential holt or resting place (145 Tributary of River Brett)
D	54 (unnamed watercourse), 55 (Tributary of River Colne), 60 (Roman River), 155 (unnamed watercourse), 183 (River Colne)	N/A
E	62 (River Blackwater), 157 (River Brain)	Potential otter feeding remains (67 Tributary of River Blackwater), Potential slide (68 River Brain), confirmed holt or resting place with kits (385 unnamed watercourse)
E and F	N/A	N/A
F	78 (River Can), 79 (Roxwell Brook), 81 (Tributary of Roxwell Brook)	N/A
G	94 (Stock Brook), 97 (Off Roxwell Brook), 98 (Havering's Grove Brook)	N/A
H	N/A	N/A
Total	27	4

Water Vole

8.5.102 A water vole desk study and field survey has been undertaken across the Order Limits. Further details regarding the approach, methodology and results of water vole surveys are set out in Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13).

8.5.103 Local record centre data was obtained within 2 km of the Order Limits on any water vole evidence from the last 10 years. Non-statutory designated sites were reviewed for any mention of water vole in their site description, and the National Water Vole Database and Mapping Project (McGuire and Morse, 2020) was reviewed for information on the trends in water vole populations at a regional and national level.

8.5.104 The desk study also included a review of all the watercourses that may be used by water vole and associated riparian habitat (the data of which was obtained through UKHab surveys) to establish the survey area.

8.5.105 The data obtained from the desk study indicated water vole presence in Norfolk, Suffolk and Essex. All records with precise locations were concentrated in Project Sections A, B, C and D, with Project Section C yielding the highest concentrations.

8.5.106 There is the potential for the Project to effect 555 watercourses (wet and dry). These were subject to a further review using aerial imagery, Ordnance Survey mapping and UKHab survey findings. This allowed for the screening out of watercourses with low likelihood of water vole activity which is documented in Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13). This screening exercise reduced the number to 204 watercourses that may have suitability for water vole and therefore required survey.

8.5.107 In 2023 and 2024, 142 watercourses were surveyed that are included in this baseline. Of the 142 surveyed watercourses, 89 were assessed to be suitable for water vole (assessed as poor, sub-optimal and optimal), and 53 were assessed to be unsuitable. Water vole was identified as absent from the watercourses that were assessed to be unsuitable, and no further surveys for water vole were undertaken on these watercourses.

8.5.108 Of the 89 watercourses assessed to be suitable for water vole, 21 had confirmed water vole presence due to sightings or the presence of confirmed water vole latrines. Fifteen watercourses were assigned potential water vole presence due to indicative signs such as potential water vole feeding stations, burrows and footprints. Table 8.19 provides a summary of watercourses with water vole presence by Project Section. These are shown on Figure A8.13.3: Water Vole Field Survey Results within Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13).

8.5.109 Further water vole surveys are to be undertaken in 2025. For the ES (Volume 6 of the DCO application), a precautionary reasonable worst-case scenario has been applied to the likely survey findings. It has been assumed that all 72 watercourses subject to survey in 2025 would have confirmed water vole field signs identified during the 2025 surveys.

8.5.110 As a species of conservation concern, watercourses that support water vole are of county level importance and medium value.

Table 8.19 Summary of watercourses with water vole presence by Project Section

Project Section	Watercourse ID	
	Water Vole Confirmed Presence (Watercourse ID Number and Name if Applicable)	Potential Water Vole Field Signs
A	1, 9, 10, 201 (all unnamed watercourses), 124 (Tributary of River Waveney 1), 126 (River Waveney), 182 (Tributary of River Tas 2)	Potential Burrow (16 Frenze Beck)
A and B	N/A	Potential Burrow (125 River Waveney)
B	25 (Tributary of River Dove); 30 (River Gipping); 32 (Wattisham Watercourse); 128 (a and b) (Tributary of River Waveney 2); 134 (Tributary of River Gipping 1); 31, 37, 133, 135 (all unnamed watercourses)	Potential feeding stations (26)
C	41(a) and 42 (River Stour), 139 (Belstead Brook)	Potential feeding stations (41(b) River Stour and 150 unnamed watercourse)
D	183 (River Colne)	Potential burrow and footprints (52 unnamed watercourse), potential burrow (54 unnamed watercourse), potential footprints (60 Roman River)
E	N/A	Potential burrows (62 River Blackwater), potential feeding stations (71 Tributary of River Ter)
E and F	N/A	Potential burrows (72 unnamed watercourse)
F	79 (Roxwell Brook)	Potential footprints and feeding stations (73 River Ter), potential footprints (81 Tributary of Roxwell Brook)
G	N/A	Potential feeding station (95 River Wid and 100 Havering's Grove Brook)
H	N/A	Potential footprints (105 unnamed watercourse)
Total	21	15

American Mink

8.5.111 One record of American mink was returned within 2 km of the Order Limits in the western suburbs of Chelmsford (Section F) approximately 1 km north of the River Can (Section C) and 1.44 km east of the Order Limits.

8.5.112 Sightings, scat, footprints or burrows of American mink were recorded in Project Section A (watercourse ID 120 River Tas), Project Section B (watercourse ID 137 unnamed), Project Section C (watercourse ID 331 Tributary of Salary Brook 1), Project Section F (watercourse ID 79 Roxwell Brook and watercourse ID 181 unnamed), and Project Section G (watercourse ID 97 Off Roxwell Brook, watercourse ID 98 Havering's Grove Brook, watercourses ID 104 and ID 181 unnamed). Figure A8.13.1: Otter and Water Vole Desk Study Results and A8.13.2: Otter Field Survey Results within Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13) show the locations of these watercourse identification numbers.

8.5.113 American mink is an INNS as listed in the WCA under Schedule 9. It is not a species of conservation concern. Its presence in a watercourse often leads to the loss of water vole populations in the locality and for this reason eradication programmes are in place in East Anglia to control the spread of American mink.

Species of Principal Importance

8.5.114 Species of Principal Importance in England, not noted elsewhere in the existing baseline, were identified through a desk study and incidental field sightings. Details of the approach to methodology and results can be found within Appendix 8.14: Species of Principal Importance Report (document reference 6.8.A14).

8.5.115 The desk study revealed that common toad, brown hare, harvest mouse, hedgehog and polecat were present across the Study Area which comprised predominantly farmland habitats suitable to support these species. The approximate locations of these records are shown on Figure A8.14.1: SPI Desk Study and Incidental Records within Appendix 8.14: Species of Principal Importance Report (document reference 6.8.A14). It is well documented that these species are present across East Anglia. They have the potential to be present in suitable habitat throughout the Order Limits, and they are therefore considered to be of local importance and of low value.

8.5.116 A summary of the results is provided in Table 8.20.

Table 8.20 Species of Principal Importance results summary

Project Section(s)	Species	No. of Desk Study Records within Order Limits	No. of Records within 2 km of Order Limits	No. of Incidental Sightings
B, E, F, G, H	Common toad	2	37	-
A, B, C, D, E, F, G, H	Brown hare	9	84	32
B, C, F, H	Harvest mouse	1	4	-
A, B, C, D, E, F, G, H	Hedgehog	16	1,022	-
A, B, C, D, E, F	Polecat	1	17	-

Badger

8.5.117 The desk study identified a total of 291 badger records within 2 km of the Order Limits over the last 10 years and it is well documented that badger is common and widespread across East Anglia.

8.5.118 A badger survey has been undertaken within the Order Limits and a 30 m buffer of the Order Limits. The primary focus of the survey work was to identify active main badger setts with surveys to be undertaken pre-construction to identify other sett types. Full details of the badger methods and results are presented in Appendix 8.15: Badger Report (Confidential) (document reference 6.8.A15).

8.5.119 A total of 123 badger setts (including potential setts) were identified within the Order Limits with a further 89 recorded within 30 m. The type of sett broken down by Project Section is set out in Table 8.21.

8.5.120 Further badger surveys are to be undertaken in 2025, and it is reasonable to assume a similar number/densities of badger territories are present and therefore that a similar number of badger setts would be identified across the remaining survey area. On this basis a precautionary reasonable worst-case scenario has been applied for the purpose of the ES (Volume 6 of the DCO application), with the same percentage of each sett type per hectare applied to the remaining 12.5%, as was found within the surveys undertaken across the rest of the Project. Therefore, it is assumed that an additional 28 badger setts would be present within the Order Limits, made up of seven main setts, one annex sett, three subsidiary setts and 17 outlier setts.

8.5.121 Badgers are common and widespread throughout East Anglia and as the results show, they are located across all Project Sections within the Order Limits. They are not a species of conservation concern, but they are afforded legal protection through the Protection of Badgers Act 1992.

Table 8.21 Badger setts present within the survey area

Project Section	Sett Type				
	Main	Annexe	Subsidiary	Outlier	Total
A	3	0	2	5	10
B	11	3	6	28	48
C	9	1	2	26	38
D	8	1	1	13	23
E	2	0	0	9	11
F	8	2	7	30	47
G	2	1	2	6	11
H	4	0	0	3	7
Total	47	8	20	120	195

Great Crested Newt

8.5.122 A detailed assessment of effects on great crested newt during construction and operation (and maintenance) has been scoped out of the ES (Volume 6 of the DCO application), as detailed within the EIA Scoping Opinion (document reference 6.20). However, information presented in the Impact Assessment and Conservation Payment Certificate (IACPC) including the Project's impact on great crested newt and the compensation provided is outlined in Section 8.7.

Future Baseline

8.5.123 The future baseline relates to known or anticipated changes to the current baseline in the future which should be assessed as part of the Project in the ES (Volume 6 of the DCO application).

8.5.124 The land that falls within the Order Limits primarily comprises traditional farmland habitats associated with agriculture, separated by a network of hedgerows, woodland and wetlands. In the short-term the agricultural practices currently applied are likely to be maintained through a mixture of grazing livestock and growing crops. Woodland and hedgerows (amongst other important habitats) are expected to be retained and expanded, assuming local and national financial incentives for nature recovery continue (such as the Environmental Land Management schemes). It is also likely that schemes for river restoration and wetland creation, for the purposes of habitat creation and flood alleviation will continue.

8.5.125 Natural England are assessing areas of interest in connection with the potential designation of a future SSSI in Project Section H. The boundary of the potential SSSI has not been confirmed but it is possible that it may overlap with the Order Limits between Linford and Southfields where (if designated) habitats improvements could be implemented through strategic management in line with the SSSI objectives set by Natural England.

8.5.126 Suffolk Wildlife Trust in partnership with the Environment Agency are actioning the Waveney and Little Ouse Recovery (WaLOR) project in Project Section B. This aims to restore and enhance the Waveney and Little Ouse River Catchment on the Suffolk and Norfolk border. The existing baseline comprises a human-altered landscape around the River Waveney (currently a canalised channel) to allow for the grazing of livestock. The water table is low in the summer caused by floodplain drainage. The proposed habitats as defined by Suffolk Wildlife Trust (2022) would deliver biodiversity benefits as outlined in Table 8.22

Table 8.22 Projected future baseline for the WaLOR project

Habitat Improvement	Details
Regenerative arable land	Reduced nutrient runoff toward floodplain improving water quality Improving soil quality, increasing food security Sustainable into the future Improved biodiversity
Reestablished old channel	Restored floodplain water storage Slowed water flow Re-meandered river with more biodiversity
Floodplain wet woodland	Improved biodiversity on an existing carbon sink
(Better) Protected land (SSSI)	Refuge and source for species to spread throughout a restored landscape
Re-established lowland peat fen	Carbon sequestration to tackle climate change Increased biodiversity Restoration of historical ecosystems Floodwater storage reducing flood risk on downstream properties

8.5.127 The purpose of the WaLOR project is to create a new landscape rich in biodiversity. Habitats and the diversity of species associated with them would improve. A key improvement would likely be in terms of connectivity between a network of sites designated for biodiversity located within that corridor, notably Redgrave and Lopham Fens SSSI, Roydon Fen LNR, Lang Fen (South) CWS, Bressingham Fen CWS, Horse Fen CWS and Horse Fen Carr CWS. It is likely that the number of birds traversing these areas, especially during the wintering season when the water levels would be higher, would increase because of these habitat improvements should they be implemented.

8.5.128 There may be long term effects to the species composition and types of habitats present within the Order Limits because of climate change. This could in turn influence the diversity of fauna present. Changes in temperature may also affect the behaviour of certain species and alter their distribution. Populations of terrestrial invertebrates have already been found to have been affected by climate change with some species moving north and others south in response to changes in temperature.

In time, cropping regimes may be altered in response to summer flooding and/or drought.

8.5.129 The key to adapting to climate change is thought to be to maintain and create habitat corridors that allow for the movement of species.

8.6 Proposed Mitigation

8.6.1 The approach to mitigation including a description of the mitigation hierarchy is set out in Chapter 5: EIA Approach and Method (document reference 6.5). Three types of mitigation have been incorporated into the Project and assessment: embedded, standard and additional environmental mitigation.

Embedded Mitigation

8.6.2 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable.

8.6.3 National Grid has embedded measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation (and maintenance) of the Project.

8.6.4 Embedded measures are those that are intrinsic to and built into the design of the Project, which have been presented in Table 4.2 in Chapter 4: Project Description (document reference 6.4). Those relevant to Ecology and Biodiversity include:

- National Grid have committed to delivering at least 10% BNG with wider environmental and societal benefits. This is reported separately, outside of the ES (Volume 6 of the DCO application). Further details can be found in the Biodiversity Net Gain Report (document reference 7.1)
- Sensitive routeing and siting – Avoid and reduce as far as practicable effects on identified biodiversity receptors. Surveys were ongoing throughout the design process with live information fed into the change control process
- The design would allow for landscape planting around CSE compounds, the new East Anglia Connection Node (EACN) Substation, around the new Tilbury North Substation (if the Lower Thames Crossing project is not constructed) and around the existing Norwich Main Substation
- Mitigation areas for landscape planting (and BNG) around permanent features are labelled '*Environmental Areas'* and are shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). Landscape planting would reduce effects – further details are provided in the Outline LEMP (document reference 7.4)
- For access roads and haul roads, the Project requires the crossing of multiple ditches, drains and watercourses. Large or sensitive watercourses, for example those designated as a main river, and those with WFD status, would be crossed by the temporary haul road using temporary clear span bridges

- Temporary and permanent sustainable drainage features form part of Project design to ensure that water quality is protected in the watercourses that would receive surface water from the Project
- Orange spacers and bird diverters are to be applied to the earth wire at the River Waveney between pylons RG87 and RG88 and Ardleigh Reservoir between pylons TB15 and TB16 as set out in the Outline LEMP (document reference 7.4).

8.6.5 The Project has also committed to undertaking trenchless crossings at the following five locations (all within Section C): Higham Road, River Stour (north part), River Stour (south part), A12 highway crossing and railway crossing (east of Ardleigh) as detailed in Chapter 4: Project Description (document reference 6.4) and presented on Figure 4.1: Proposed Project Design (document reference 6.4.F1). This would reduce ecological effects compared to open-cut construction, particularly on the aquatic biodiversity receptors.

8.6.6 The assessment in this chapter is based on the Lower Thames Crossing project proceeding as it has consent that interacts with Project Section H. Lower Thames Crossing requires the removal of part of Rainbow Wood and Ashen Shaw LWS, part of which is an ancient woodland site. An alternative ancient woodland mitigation site has been included within the Order Limits for the Project and agreed with the Lower Thames Crossing project team to ensure no loss of ancient woodland mitigation in terms of area.

Standard Mitigation

8.6.7 Standard mitigation measures, comprising management activities and techniques, would be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.

8.6.8 The Outline Code of Construction Practice (CoCP) (document reference 7.2) contains relevant standard/good practice measures relating to Ecology and Biodiversity. Note that measures have been assigned references, for example (GG01). For ease of cross-reference, these align with the references provided in Table 6.1 of the Outline CoCP (document reference 7.2). These measures include but are not limited to:

- GG17: Any activity carried out or equipment located within a temporary construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration, and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where reasonably practicable (see Appendix B: Site Waste Management Plan, Appendix D: Dust Management Plan and Appendix F: Noise and Vibration Management Plan of the Outline CoCP (document reference 7.2) for further details)
- GG26: Construction lighting will be of the lowest luminosity to safely perform each task and include motion sensors or be switched off when not in use where it is safe and efficient to do so. Permanent lighting (where required) will be designed, positioned, and directed to reduce the intrusion into adjacent properties, protected species, and habitats. Task-specific lighting will be directed to reduce intrusion so far as is reasonably practicable, and considered by all necessary specialists.
- B01: The Main Works 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 in the ES and

through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences. Where certain biodiversity receptors have been identified or where there is potential for them, and effects cannot be avoided during construction, Reasonable Avoidance Measures and/or Precautionary Working Methods may also be developed and implemented under supervision by an Ecological Clerk of Works (ECoW)

- B02: Construction effects will be designed out / minimised as far as practicable through, for example, minimising land-take / habitat loss and locating access tracks / haul roads and temporary construction compounds / material storage areas outside of ecologically sensitive sites/habitats (such as statutory and non-statutory designated sites, priority habitats and wetlands). Clearly demarcated, dedicated access routes will be provided during construction and any areas required for temporary works will be reinstated on completion
- B03: Best environmental practice techniques will be followed with regards to:
  - The control of dust and other emissions from construction
  - Appropriate preventative measures to prevent debris arising from the construction works and sediment runoff and silt dispersal into watercourses
  - Chemicals and fuels storage and pollution incident response procedures
  - Imposed and signposted site speed limits on all haul roads and access tracks to minimise the risk of road traffic collisions with fauna
  - The control of noise and vibration to ensure it is kept to the minimum necessary (see Outline Dust Management Plan in Appendix D)
  - Appropriate protective areas (around woodland, hedgerows and trees) will be established using appropriate fencing and signage which will be inspected, repaired, and replaced as necessary. The protective areas will be shown on the Reinstatement Planting Plan secured by Requirement 9 in the draft DCO (document reference 3.1)
- B04: Measures must be taken to prevent the spread of INNS of terrestrial and aquatic plants. Appropriate exclusion zones will be demarcated and enforced around areas of INNS (informed by an up-to-date site walkover) to avoid spread or propagation (through seeds, rhizomes, fragments, etc.). Appropriate biosecurity measures will be documented in a method statement and implemented during construction to prevent the spread of INNS via personnel, vehicles, plant, or machinery. Workers will be equipped with the necessary equipment, Personal Protective Equipment (PPE) and substances to implement biosecurity control measures, including effective hygiene and sanitation practices. This will most frequently comprise disinfectant tablets, sprayers, and brushes to clean and disinfect equipment and PPE prior to entering/leaving INNS exclusion zones. Water used to clean vehicles will be controlled to prevent spreading of INNS
- B05: Excavations must be covered or securely fenced (with no potential access points beneath fencing) when not in use (e.g., overnight) to prevent entrapment of animals. Alternatively, the excavation will include measures, such as a battered edge or ramp, that allow animals to escape
- B06: Lighting used for construction must be switched off when not in use and positioned to minimise spill on to adjacent land or retained vegetation. Lighting

should be directional, away from biodiversity receptors and kept to a minimum so that the surrounding landscape remains unlit. All lighting (i.e., construction and operation (and maintenance)) will also be designed following the joint guidance provided by the Institution of Lighting Professionals and Bat Conservation Trust (2023). The lighting design will account for the potential effects on ecology by taking measures to minimise lighting usage, minimise light spill, use most appropriate wavelengths of light and locate lighting in the most appropriate locations to decrease the potential displacement effects on the natural environment and light sensitive fauna such as bats

- B07: Construction Exclusion Zones (CEZ) will be established prior to construction to define working areas and ensure protection of retained habitats throughout the Project. A minimum buffer of 10 m (where practicable) will be retained around priority habitats (including watercourses) to reduce any potential direct or indirect effects on the habitats and species associated with them and the CEZ may need to be extended beyond 10 m for certain biodiversity receptors, such as woodlands and trees for example, to protect root protection zones
- B08: All hedgerows, shrubs, trees or dense vegetation will be retained as far as is practicable. Where these measures are not possible and works are needed to be carried out during the bird breeding season, all areas to be affected will be checked by the ECoW for evidence of nesting birds 24 hours (as standard) prior to the vegetation removal or tree felling works taking place. There may be some instances where 24 hours is not practical, therefore a maximum period of 48 hours is permitted with contractors having a duty of care to look out for birds prior to removal. If any active bird nests are discovered these will be given a minimum standoff of 5 m (this may increase depending on species, proposed works and location) where no potentially disturbing works will take place until the young have fledged and the nest is vacated. A second nesting bird check would then be undertaken to ensure the tree or vegetation does not contain any further active nests prior to felling or removal works taking place
- B09: Any required vegetation removal that is suitable to harbour amphibians, reptiles (key reptile sites) and small mammals will be subject to a two-stage cut and overseen by an ECoW. Firstly, vegetation will be cut to approximately 150 mm (with the arisings removed). Following a minimum of 24 hours (to allow animals to naturally disperse from the area), a second cut down to ground level will be undertaken. Vegetation will be cleared during suitable weather and seasonal conditions and using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring animals as determined by the ECoW
- B10: PRFs, identified by a competent ecologist or ECoW, will be graded as PRF-I and PRF-M (in line with current guidance) and an alternative roost structure(s), i.e., bat box(es), will be provided for all confirmed bat roosts in line with the provisions of a bat licence
- B11: Method statements will be developed to ensure that any culverts installed within watercourses include suitable measures to allow the passage of animals (i.e., otters, water vole and fish) throughout construction, accounting for fluctuating water levels. For otter and water vole this may comprise an adjacent dry pipe. Where appropriate, in-channel works will be supported using a cofferdam, and for certain watercourses this will require fish rescue to be carried out under licence from the Environment Agency. This will entail using stop nets or

equivalent to enclose the area of work and electric fishing the area a minimum of three times. Rescued fish will then be released a suitable distance downstream. The duration of construction activities within watercourses will be kept to a minimum to minimise effects. In-channel works will avoid fish spawning seasons where practicable

- B12: Where temporary habitat removal is required to facilitate construction, this will be reinstated. Reinstatement will aim to provide habitats of equal or better value to those affected and permanent land take will be mitigated with additional habitat creation/ enhancement; minimum of 10% BNG is being sought. Accordingly, hedgerows scheduled for removal will be reinstated and, where appropriate, be improved from their baseline condition e.g., defunct, or species-poor hedgerows will be replanted to achieve species-rich and continuous hedgerows, once re-established
- B13: The location of CEZs will be defined within the Outline LEMP and informed by a pre-construction ecological walkover (to identify any changes to the baseline), a tree survey (to British Standard (BS) 5837:2012 (British Standards Institution, 2012)) and would be in line with regional Environment Agency and Internal Drainage Board requirements (excluding required access crossing points). The Reinstatement Planting Plan, secured by Requirement 9 in the draft DCO (document reference 3.1), defining the location of specific protective measures (i.e., fencing and signage) detailing habitat reinstatement and creation measures. There will be a refinement post-consent, that within the provisions of the Outline LEMP (document reference 7.4) aims to further reduce vegetation losses prior to pre-commencement
- B14: Wherever practicable, habitat connectivity will be retained by using existing access routes, reducing working widths through biodiversity receptors, and maintaining connectivity through green corridors such as hedgerows and watercourses
- B15: Where tree surgery to the crown or roots is necessary (such as where tree surgery is required to achieve electrical safety clearances), this will be undertaken in accordance with BS 3998:2010 (British Standards Institution, 2010); however, the Project, and specific construction tasks, will take a hierarchical approach to trees: aiming to retain as many trees as possible in the first instance; and avoiding total loss of habitat where practicable (i.e. by pollarding or coppicing rather than complete removal)
- B16: Where construction activities are found to conflict with the presence of other protected or notable species, method statements will be produced and (where appropriate) construction will only proceed under a derogation licence issued by Natural England. Natural England will only issue a derogation licence in relation to a development proposal if the licensed actions are reasonably anticipated to maintain the favourable conservation status of a species or provide a conservation benefit. Thus, overall effects are anticipated to be neutral/beneficial. Species (and habitat) specific mitigation and the requirement for pre-construction surveys and/or monitoring are set out in the ES in accordance with licensing expectations
- B17: Ancient woodlands will be protected throughout the works, with a minimum exclusion zone of 15 m offset from the edge of the ancient woodland being installed where practicable, to ensure no effects occur as a result of construction works, with the exception of the ancient woodlands set out in Appendix B: Ancient

Woodland and Veteran Tree Strategy of the Outline LEMP (document reference 7.4)

- B18: Natural England has agreed to the use of a DLL approach to mitigate effects on great crested newt. Implementation of the DLL will be conducted and overseen by Natural England
- B19: The Project is also committed to adopting a sustainable approach to development by proactively taking measures to ensure that the Project leaves the environment in a better condition than it was before development (including but not limited to delivering 10% BNG with environmental and societal benefits). The Project will seek to provide strategic habitat enhancement and creation, aiming to identify and implement opportunities to improve habitat quality and connectivity and align with national nature recovery objectives and projects. Such measures may include specific habitat creation and enhancement measures and additional receptor-specific measures such as the creation of habitat piles and installation of bird and bat boxes
- B20: All works (including all excavation works) associated with the 132 kV PSB cable sealing end platform, will stay out of the 15 m buffer from Mann / Parson's Wood Ancient Woodland and the associated Parson's and Queen's Wood LWS
- B21: The temporary construction haul roads and associated working area will be micro-sited to avoid the 15 m root protection area from Stonefield Strip Ancient Woodland
- B22: The works area for flexibility to install utility connections to compounds TB-CC07/TB-Main will avoid the 15 m buffer from the ancient woodland known as Sheepcote's Wood
- B23: The working area for the temporary construction haul roads will be micro-sited to avoid the 15 m root protection area from the ancient woodland associated with Botneyhill LWS
- B24: Commitment to only manage trees/ vegetation from the southern side of Bullen Lane as part of the visibility splay to avoid impacts on Millers Wood Local Wildlife Site and associated ancient woodland
- B25: Commitment to micro-site temporary construction haul road outside the 15 m buffer from Rivenhall Thicks Ancient Woodland where practicable or use no-dig construction methods for the short stretch of haul roads located within 15 m buffer
- B26: A trenchless crossing method statement and contingency plan will be prepared for the Stour crossing once detailed design is available and submitted to the relevant Local Planning Authority and Natural England for information
- W01: All qualifying works within and in proximity to main rivers and flood defences will be in accordance with a method approved under environmental permits issued by the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2016. Qualifying works to ordinary watercourses will accord with the protective provisions of the DCO for the benefit of the Lead Local Flood Authorities (LLFA)
- W02: For open cut watercourse crossings and installation of vehicle crossing points, mitigation measures will include but not be limited to:

  - Where practicable, reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working and reinstating the riparian vegetation and natural bed of (where practical) the watercourse, using the material removed when appropriate on completion of the works and compacting as necessary
  - Installation of a pollution boom downstream of open cut works
  - The use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required
  - Have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident
  - The use of all static plant such as pumps in appropriately sized spill trays
  - Prevent refuelling of any plant or vehicle within 15 m of any watercourse
  - Prevent storing of soil stockpiles within 15 m of any watercourse or drain where practicable
  - Inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids
  - Reinstating the riparian vegetation and natural bed of the watercourse, using appropriately sized material of similar composition to that removed. As far as practicable gravel will be retained in-channel. Where practicable, reinstated material will aim to closely match what is removed, particularly gravel, at between 15 and 40 mm in size to ensure suitability for fish spawning

- W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Culverts in waterbodies will either preserve the natural bed or be box culverts with inverts sunk a minimum of 300 mm below the hard bed of the watercourse with natural/existing bed material placed across the inside of the culvert to lift the level up to meet that of the existing. New culverts will be as short as practicable and sized to avoid narrowing of natural channel widths. Temporary culverts will be sized to convey flows generated by upstream catchments to maintain the current land drainage regime and during culvert installation, downstream flows would be maintained
- W05: In the event of a spill during construction, a response would be triggered in accordance with approved site procedures. In the unlikely event of a spill not being suitably contained on site and reaching a water source that supports abstraction for private water supply, when detriment to a water supply is proven as part of the incident investigation, an alternative supply will be provided until the contamination is suitably remediated
- W06: Where a main river is crossed by a trenchless crossing, the cables will be laid at least 1 m below the hard bed level of the river and will remain at or below this level for not less than 3 m from the brink of the riverbank. Marker posts shall also be positioned on each bank of the river to indicate the location of the under-crossing and the nature of the works. The Project proposed the following trenchless crossings (as detailed in Table 4.9 within ES Chapter 4: Project Description (document reference 6.4)):
  - Section C: Higham Road
  - Section C: River Stour (north part), River Stour (south part)

- Section C: A12 highway crossing
- Section C: Railway crossing (east of Ardleigh).

- W07: Where construction activities take place in Flood Zone 3, temporary construction compounds, laydown areas and other work sites will be laid out in accordance with the Sequential Test and incorporate flood resilience measures where necessary. There would be no land raising and storage of construction equipment and materials will be done in such a way as to avoid forming barriers to floodplain flows. Material storage areas will be located outside of the fluvial floodplain where practicable
- W08: Measures to manage surface water runoff from operational above ground infrastructure and to maintain existing overland flow routes, for example the proposed box culverts at the proposed Tilbury North Substation and the eastern of the two CSE compounds, will be developed liaising with the LLFAs. Such measures will be managed in accordance with the requirements and standards of the relevant LLFA and maintained for the Project's lifetime. Surface water runoff will be captured using sustainable drainage techniques that will be designed to allow for climate change resilience and with consideration of exceedance flow routes
- W09: Where construction activities take place within surface water flood zones, including statutory undertaker works, prior to works commencing appropriate site drainage will be put in place to reduce the risk of standing water and avoid substantial delays to the construction programme, as well as to prevent offsite increases in surface water flood risk
- W10: Where temporary construction haul roads pass within or cross watercourses and/or their floodplains and key overland flow routes, the haul road design will include flood mitigation/drainage to allow for the flow of water within the floodplain during flood events up to and including the 1% Annual Exceedance Probability event (i.e., ducting). The design of the haul roads themselves will include some resilience to flooding for example, incorporating suitable geo-textiles to stabilise the road surfacing, as well as allowing water to flow within the floodplain. Suitable materials would be used to surface the haul roads. In some cases, bespoke construction methodologies may be used based on site constraints and ground conditions
- W12: For access roads and haul roads, the Project requires the crossing of multiple ditches, drains and watercourses. Large or sensitive watercourses, for example those designated as main rivers, and those with Water Framework Directive (WFD) status, would be crossed using clear span bridges or suitably assessed and approved alternatives. Soffit heights at clear span crossings would be set on a site-specific basis, following more detailed survey and design work by the appointed Main Works Contractor(s). On watercourses with a high or good WFD status for invertebrates, soffits will be set as high as is practicable above the Q95 water level, accounting for site specific constraints and to reduce impacts to ecology
- W13: Surface water drainage features, based on Sustainable Drainage System (SuDS) techniques, will be installed at temporary compound sites and laydown areas during construction. These areas will be reinstated after completion of the temporary works, as agreed with the landowner. Access roads and haul roads, as well as areas where impermeable material will be installed where heavy

equipment would be used, will also have suitable drainage provisions via appropriate SuDS that will provide attenuation and treatment of runoff

- W14: Once the Project has been constructed, the working areas will be removed. Any stripped topsoil will be reinstated, and the site will be returned to its former use, subject to any planting restrictions or agreements with landowners. Temporary bridges and culverts (associated with the temporary construction haul roads) will only be retained by exception e.g. if the new temporary structure has replaced an existing one in poor repair. When these locations are confirmed, crossings would be designed to reflect their permanence e.g. culvert sizing to accommodate climate change allowance. Replacement drainage schemes will be installed where appropriate. A specialised drainage contractor(s) will review the drainage designs and the relevant LLFA will be consulted on proposals (where it is not simply a replacement of the existing drainage run). The specialist contractor(s) will provide advice to National Grid and the Main Works Contractor(s) during all relevant construction and reinstatement activities. Permanent records of the land drainage locations will be made and passed to the landowners/occupiers
- W15: Temporary and permanent drainage outfalls proposed will comprise only a small diameter (less than 300 mm) buried pipe and a small outfall structure set into the bank of the watercourse. A wide swathe is included within the Order Limits to allow flexibility to aid the selection of an outfall location and pipe alignment that is technically feasible and one that minimises effects on vegetation loss. Works will minimise effects where practicable
- W16: The water supply needs of the Project during construction will be sourced either from mains water supply or in remote locations, where this option may not be available, water will be tankered in. Water use would be monitored and reported and measures to encourage efficient water use would be put in place. Grey water generated from welfare facilities will be discharged to the public sewer, or where this is not practicable, collected and tankered off site to a licensed disposal facility.

8.6.9 The Outline CoCP (document reference 7.2) is secured by Requirement 4 in the Draft DCO (document reference 3.1) which would require the Main Works Contractor(s) to prepare the CoCP to discharge the Requirement.

Additional Mitigation

8.6.10 Additional mitigation comprises measures over and above any embedded and standard mitigation measures, for which this ecology and biodiversity assessment has identified a requirement to further reduce significant environmental effects.

8.6.11 The Outline LEMP (document reference 7.4) has been produced to detail the additional environmental measures that would be implemented to avoid, minimise, mitigate and compensate (ecology only) the landscape and visual and ecological features likely to be affected during construction and operation (and maintenance). It sets out how the land, vegetation and habitats would be reinstated following construction. It includes details on additional mitigation measures required for ecology during construction and post-construction, as well as detailing any required management of these receptors post-construction.

8.6.12 The Outline LEMP (document reference 7.4) is secured by Requirement 4 in the Draft DCO (document reference 3.1) which would require the Main Works

Contractor(s) to prepare the LEMP to discharge the Requirement. The Main Works Contractor(s) would be responsible for implementing the measures identified within the LEMP and associated management plans/strategies.

8.6.13 The measures detailed would ensure that legislation and good practice guidance is followed to avoid, reduce, mitigate or compensate (where practicable).

Designated Sites

8.6.14 Mitigation measures set out within the Outline CoCP (document reference 7.2), particularly the avoidance of direct effects through design and the implementation of B03, would remove potential significant effects associated with dust, noise and hydrological effects on most statutory designated sites within the Study Area.

8.6.15 There are 11 CWSs and 22 LWSs that have been identified as having other direct/indirect effects because of the proposed works (some also include potential hydrological impact pathways). Mitigation measures set out within the Outline CoCP (document reference 7.2) would mitigate for some of these effects and details on any specific additional mitigation per LWS/CWS has been provided where relevant in Table 8.23.

Habitats

8.6.16 Where temporary habitat removal is required to facilitate construction, this will be reinstated. National Grid have committed to delivering at least 10% BNG with wider environmental and societal benefits. Accordingly, hedgerows scheduled for removal during construction will be reinstated and, where appropriate, will be improved from their baseline condition e.g., defunct, or species-poor hedgerows will be replanted to achieve species-rich and continuous hedgerows, once re-established.

8.6.17 Reinstatement is defined within the Outline LEMP (document reference 7.4) secured by Requirement 4 in the Draft DCO (document reference 3.1) and informed by a pre-construction ecological walkover (to identify any changes to the baseline), a tree survey (to British Standard BS 5837:2012 (British Standards Institution, 2012)) and will be in line with regional Environment Agency and Internal Drainage Board requirements (excluding required access crossing points). The final version of the LEMP will also include Retention and Reinstatement Plans, detailing habitat reinstatement and creation measures.

8.6.18 Wherever practicable, habitat connectivity will be retained by using existing access routes, reducing working widths through biodiversity receptors, and maintaining connectivity through green corridors such as hedgerows and watercourses.

8.6.19 Where tree surgery to the crown or roots is necessary (such as where tree surgery is required to achieve electrical safety clearances), this will be undertaken in accordance with BS 3998:2010 (British Standards Institution, 2010); however, the Project, and specific construction tasks, will take a hierarchal approach to trees: aiming to retain as many trees as practicable in the first instance; and avoiding total loss of habitat where practicable (i.e. by pollarding and trimming, rather than complete removal, where applicable).

8.6.20 Following detailed design and prior to construction (of relevant parts of the Project), relevant surveys will be undertaken of arboricultural features that may be impacted or need to be removed to ensure any tree/ hedgerow removal is reduced as far as practicable.

8.6.21 In addition to the reinstated habitats across the route, there would also be '*Environmental Areas'* located around the new/extended National Grid permanent assets - shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). An indicative landscape design has been created for these areas as described and illustrated in the Outline LEMP (document reference 7.4). The habitats to be created and/or enhanced in these areas have been designed to provide landscape and visual benefits while also offering ecological value. Where created or enhanced habitats are located within these Environmental Areas they will be counted within the BNG assessment and be subject to a 30-year management regime. Further detail is included within the BNG Report (document reference 7.1).

8.6.22 Under the scenario that Lower Thames Crossing (LTC) is constructed, following the successful consent on their DCO in May 2025, the Project proposals constrain/reduce the extent of the land available for the proposed LTC nitrogen deposition mitigation around the new Tilbury Substation.

8.6.23 A review of the site selection process for this original nitrogen deposition compensation site was undertaken, based on the information available from LTC submitted documentation. Using this same site selection criteria a suitable alternative nitrogen deposition compensation planting area has been identified and included within the Norwich to Tilbury Order Limits. The identified alternative area is close to the original compensation site (on the other side of the Orsett Golf Course), close to the proposed LTC works and larger in extent than required to match the area affected. As per the LTC documentation the required 70:30 planting proposed split between woodland and grassland (or other habitat) planting is proposed within this alternative area. The identified area provides more than sufficient capacity to replicate the commitment made under the LTC DCO with respect to nitrogen deposition compensation planting. Areas are presented on Figure 4.1: Proposed Project Design (document reference 6.4.F1).

Fauna

8.6.24 Pre-commencement surveys will be undertaken for several species/species groups because of the time that will have elapsed since the baseline surveys were undertaken and the possibility that species presence or activity could have changed in the intervening period. Where pre-construction surveys are deemed to be required this has been outlined within Section 8.7 below and the Outline LEMP (document reference 7.4).

8.6.25 The results of the pre-commencement surveys will be used to identify whether any changes to the mitigation measures are required and the Final LEMP will be updated to reflect the survey results, as required.

8.6.26 Where construction activities are found to conflict with the presence of other protected or notable species (species of conservation concern), method statements would be produced and (where appropriate) construction will only proceed under a derogation licence issued by Natural England. Natural England will only issue a derogation licence in relation to a development proposal if the licensed actions maintain the favourable conservation status of a species or provide a conservation benefit. Natural England has agreed to the use of a DLL approach to mitigate effects on great crested newt. Implementation of the DLL will be conducted and overseen by Natural England.

8.7 Residual Effects

8.7.1 The likely significant effects of the Project have been assessed using current available data relating to both the construction and operation (and maintenance) phases of the Project. This section presents the residual effects of the Project following the application of all mitigation (embedded (design measures), standard mitigation, and additional mitigation measures).

8.7.2 Table 8.23 and Table 8.24 outline the receptor, the value and importance of the receptor, which elements of the Project would affect the receptor, the pathway to effect (in the absence of mitigation), details of mitigation and then the residual effect following the application of mitigation.

Construction

8.7.3 To ensure that the appropriate level of mitigation has been applied, the potential pathways to effect during construction have been set out for each biodiversity receptor in Table 8.23.

8.7.4 In line with the EIA Scoping Opinion (document reference 6.20), the following impact pathways have been identified during the construction phase which, along with the ZoI, include:

- Collision of nocturnal species with machinery during construction, within the Order Limits
- Disturbance of protected/notable fauna from lighting during construction, within the Order Limits and up to 500 m dependent on species
- Hydrological changes in surface water during construction and up to 500 m beyond the Order Limits, dependent on habitat/species
- Habitat loss and fragmentation during construction within the Order Limits
- Air quality changes (resulting in habitat loss/modification) during construction on ancient woodland, up to 15 m from the Order Limits
- Killing or injury of protected/notable species, within the Order Limits.

8.7.5 No significant negative effects on habitats because of construction traffic have been identified in Section 7.7 of Chapter 7: Air Quality (document reference 6.7) and so air quality effects to habitats and species associated with construction traffic have been scoped out of this assessment and not considered further.

Table 8.23 Impact assessment including residual effects on ecology and biodiversity receptors during construction

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
International (Statutory) Sites Designated for Biodiversity					
Stour and Orwell Estuaries Ramsar Site and SPA (Section C)	Very High/International	The Project would not directly affect the designated site, which at its closest point is 3.07 km from the Project. The wintering/passage bird surveys have identified that FLL associated with these sites is present within the Order Limits and adjacent land. Works in these areas comprise open cut trenching for underground cables, construction of a haul road, a temporary construction compound, construction laydown area and a temporary attenuation drainage (TAD) pond.	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. With reference to the crossing of the River Stour, while trenchless crossings would avoid physical disturbance to the flow regime and form of channel and riparian corridors, the technique is not without risk of pollution, associated with inadvertent releases of drilling fluids/muds. Open cut crossings of watercourses upstream of the River Stour would cause disturbance of bed sediments upstream of the River Stour. Habitat Loss – it is proposed to cross the River Stour using trenchless techniques. A failure in this system could cause harm to the watercourse affecting downstream habitats including those within the designated site. Given the distance involved and dilution it is unlikely this would have a lasting effect on the habitats within the designated sites. Tidal waters would likely quickly remove any pollutants so that they would not cause harm to habitats or species. Habitat Loss - temporary loss of arable land used by golden plover and lapwing to facilitate construction. As identified in the HRA (document reference 5.3), there is sufficient alternative habitat closer to the designated site that effects on these species associated with temporary habitat loss would not be significant. Disturbance - change in noise levels, vibration, light and movement that may result in the disturbance or displacement of qualifying avian features (specifically lapwing and golden plover) during the construction phase. Birds using FLL during the wintering period close to the River Stour (as defined in the HRA) would also be at risk of disturbance during the construction phase. Overall, there is the potential for a significant effect (small negative magnitude) on qualifying features in the absence of mitigation in the	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. . Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the FLL on the ecological constraints ahead of works. As identified in the HRA (document reference 5.3) and agreed with Natural England, there is sufficient alternative habitat closer to the designated site that effects on these species associated with disturbance would not be significant.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the Stour and Orwell Estuaries Ramsar Site and SPA.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			medium term which would be reversible following construction. Potential for hydrological effects, habitat loss and disturbance associated with the Ramsar Site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. This effect would be considered significant.		
Thames Estuary and Marshes Ramsar Site and SPA (Section H)	Very High/International	There would be no direct or indirect effects on the qualifying habitats, features and FLL associated with the site with construction works taking place at the closest point 2 km west.	In the absence of mitigation no significant, negative or positive (negligible magnitude) effects on this Ramsar Site and SPA are predicted.	Not required.	None.
Norfolk Valley Fens SAC (Section A)	Very High/International	There would be no direct effects on designated habitat within this site which at its closest point is 350 m from the Order Limits. Construction activities would take place close to a tributary of the River Tas, which flows into the SAC. Activities comprise the removal of an existing 11 kV (RG route) conductor over the watercourse and the installation of the conductors under the watercourse (likely to be an open trench crossing).	Hydrological - with reference to the crossing of the River Tas tributary, there would be physical disturbance to the flow regime and form of channel and riparian corridors with releases of sediment upstream of the SAC. Potential for hydrological effects associated with this site in the absence of mitigation is a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Norfolk Valley Fens SAC.
All other internationally designated sites within the Study Area	Very High/International	No works within the Zone of Influence of these sites.	None.	Not required.	None.
National (Statutory) Sites Designated for Biodiversity					
Flordon Common SSSI (component of Norfolk Valley Fens SAC) (Section A)	High/National	There would be no direct effects on designated habitat within this site which at its closest point is 350 m from the Order Limits. Construction activities would take place close to a tributary of the River Tas, which flows into the SSSI. Activities comprise the removal of an existing 11 kV conductor over the watercourse (RG route	Hydrological - with reference to the crossing of the River Tas tributary, there would be physical disturbance to the flow regime and form of channel and riparian corridors with releases of sediment upstream of the SSSI. Potential for hydrological effects associated with this site in the absence of mitigation is a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Flordon Common SSSI.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		between RG24 and RG25) and the installation of the conductors under the watercourse (likely to be and open trench crossing).	quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.		
Cattawade Marshes SSSI, Stour Estuary SSSI and Orwell Estuary SSSI (components of the Stour and Orwell Estuaries Ramsar Site and SPA) (Section C)	High/National	No effects with the sites located outside the Study Area and the ZoI.	None.	Not required.	None.
Mucking Flats and Marshes SSSI (component of Thames Estuary and Marshes Ramsar Site and SPA) (Section H)	High/National	No effects with the site located outside the Study Area and the ZoI.	None.	Not required.	None.
South Thames Estuary and Marshes SSSI (component of Thames Estuary and Marshes Ramsar Site and SPA) (Section H)	High/National	No effects with the site located outside the Study Area and the ZoI.	None.	Not required.	None.
Middle Wood Offton SSSI (Section B) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Aslacton Parish Land SSSI, Forncett Meadows SSSI, Shelfanger Meadows SSSI (all in Section A)	High/National	See habitat row relating specially to GWDTE in this table.	-	-	-
All other national (statutory) designated site for biodiversity.	High/National	No works identified within the ZoI.	None.	Not required.	None.
Local (Statutory) Sites Designated for Biodiversity					
Roydon Fen LNR (Section A), Bramford Meadows LNR (Section B), Needham Lake LNR (Section B), Brockwell Meadows LNR (Section E) and Chelmer Valley	Medium/County	Hydrologically linked to construction activities upstream with the GWDTE identified within these sites.	Excavations and foundation work may alter groundwater flow paths, change groundwater levels, and potentially contaminate the water that supplies the GWDTE within the LNRs. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter.	Following the application of the outlined mitigation, it is concluded that there would be an overall negligible magnitude of impact with no significant residual effect on the LNRs identified.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
Riverside LNR (Section F).			last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.		
Local (Non-statutory) Sites Designated for Biodiversity					
Bullen Wood CWS (Section B) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Fore and Bushey Groves CWS (Section B)	Medium/County	The existing RG 33 kV line would be taken down and undergrounded along its current alignment through the CWS.	Habitat loss – < 0.01 ha of cereal cropland and 0.25 ha of lowland mixed deciduous woodland would be temporarily lost. Potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a small negative effect and reversible in the long-term. This effect would be considered significant.	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the CWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Fore and Bushey Groves CWS.
Norton's Wood CWS (Section A)	Medium/County	Outside the Order Limits within 1.3 m of the temporary haul road near pylon RG19.	Habitat Loss - potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	The edge of the construction area would be demarcated to ensure no accidental encroachment into adjacent land as set out within the Outline CoCP (document reference 7.2).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Norton Wood CWS.
Miller's Wood CWS (Section B) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
River Gipping (Sections) CWS (Section B)	Medium/County	Construction of pylon RG165 would take place within 10 m of the watercourse. The CWS would be over sailed by the new 400 kV overhead line. Any trees within 20 m either side of the centre line would be permanently removed and any within an additional 8 m either side managed for safety reasons. To avoid any effects to instream habitats and species the Project would use the A1120 road bridge to cross	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the River Gipping (Sections) CWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		the River Gipping 1.43 km upstream of the designated site. (See also GWDTE below.)	once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.	Replacement tree planting would be undertaken outside of the electrical clearance distances but within the CWS or adjacent.	
River Waveney (Sections) CWS (Section B)	Medium/County	No direct effects to designated habitat. The haul road would cross a watercourse that directly flows into the CWS (80 m downstream), using a temporary single span bridge. The permanent access route for RG88 would also cross this watercourse 70 m upstream of the CWS. (See also GWDTE below.)	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary and permanent crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the River Waveney (Sections) CWS.
RNR 200 (Section B)	Medium/County	Vegetation management within a visibility splay lies adjacent to, but not within, the RNR.	Habitat Loss - potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	The edge of the construction area would be demarcated to ensure no accidental encroachment into adjacent land as set out within the Outline CoCP (document reference 7.2).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the RNR 200.
Round Wood and Elms Grove CWS (Section B) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Somersham Park CWS (Section B) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Thrandeston Marsh CWS (Section B)	Medium/County	Undergrounding of existing 132 kV overhead line would be undertaken on the very eastern edge of the CWS. This would involve crossing a watercourse within the CWS. (See also GWDTE below.)	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss – < 0.01 ha of cereal cropland and 0.29 ha of other neutral grassland would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. As part of design, the undergrounding swathe has been reduced to 20 m in width through the designated site to reduce direct effects. The ECoW would give a briefing to the Main Works Contractor(s) working within the CWS on the ecological constraints	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Thrandeston Marsh CWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	ahead of works. Any habitats temporarily lost would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4).	
Black Brook LWS (Section C)	Medium/County	Two temporary attenuation drainage ponds would outfall into the Black Brook LWS (adjacent to Ipswich Road). The JC alignment for underground cables cross Black Brook, this crossing point is directly upstream from the LWS by 260 m. (See also GWDTE below.)	Hydrological - potential for deterioration of water quality through generation of silted or polluted runoff in the absence of mitigation. Habitat Loss – 0.05 ha of lowland dry acid grassland, 0.12 ha of other lowland acid grassland, 0.01 ha of reedbed, and < 0.01 ha of bramble scrub, lowland mixed deciduous woodland, other woodland; broadleaved, and other neutral grassland would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. Bankside vegetation would be allowed to naturally regenerate from the seedbank in the soil following ground disturbance. The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works. Mitigation is detailed within the Outline LEMP (document reference 7.4).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Black Brook LWS.
Harrow Wood LWS (Section D) also ancient woodland.	High/National	No direct or indirect effects. A permanent access route (right of access only – no physical works) would be located on the edge of LWS boundary. No works would be required for the permanent access route as an existing track would be used.	Habitat Loss - Potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	The edge of the woodland would be demarcated to ensure no accidental encroachment as set out within the Outline CoCP (document reference 7.2).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Harrow Wood LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		An Environmental Area would be located adjacent to the woodland. There would be no other construction elements within 50 m of the LWS which is also identified as an ancient woodland site in its site description but not identified as such on the Ancient Woodland inventory (Natural England, 2024).			
Higham Meadow CWS (Section C)	Medium/County	Temporary attenuation drainage would outfall into a watercourse within the CWS. (See also GWDTE below.)	Hydrological - Potential for deterioration of water quality through generation of silted or polluted runoff in the absence of mitigation. Temporary habitat loss – 0.03 ha of lowland mixed deciduous woodland and < 0.01 ha of other neutral grassland would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration of poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Vegetation would be allowed to naturally regenerate from the seedbank in the soil following ground disturbance. The ECoW would give a briefing to the Main Works Contractor(s) working within the CWS on the ecological constraints ahead of works. Mitigation is detailed within the Outline LEMP (document reference 7.4).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Higham Meadows CWS.
Sproughton Park CWS (Section C)	Medium/County	Pylon JC16 would be located within the CWS and would require a small area of temporary habitat loss during works and even smaller area of permanent habitat loss associated with the pylon foundations. A temporary haul road would be required up to the pylon working area from the north but would not cross the river to the south. The existing 132 kV overhead line that	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss – 0.03 ha of lowland mixed deciduous woodland and 0.02 ha of other neutral grassland would be permanently lost. 0.03 ha of modified grassland, < 0.01 ha of cereal cropland, < 0.01 ha and 1.39 ha of other neutral grassland would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. The 132 kV undergrounding swathe would be reduced to 25 m in width through the designated site to reduce direct effects. The ECoW would give a briefing to the Main Works Contractor(s) working within the CWS on the ecological constraints ahead of works. Any temporarily removed habitats would be reinstated in line with the	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Sproughton Park CWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		currently crosses the CWS would be removed and undergrounded on the same alignment through the CWS. The very eastern extent of the CWS would be crossed by a permanent access (right of way only), an existing track would be used for ongoing maintenance. The pylon would be located within the HPI floodplain grazing marsh; targeted botanical surveys of this area undertaken for the Project revealed that the UKHab habitat type *'other neutral grassland'* that would be affected by the Project was not botanically diverse.	considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4).	
Stonefield Strip (Section D) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Coggeshall Hall Farm LWS (Section E)	Medium/County	The new 400 kV overhead line would over sail the LWS at a narrow point. Some tree loss would be required to facilitate safety clearances, but this would be minimal. A new single span bridge would be installed over the River Blackwater to accommodate a temporary haul road. A permanent access route would cross the LWS to the north making use of an existing track (right of access only – no physical works). (See also GWDTE below.)	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss - Some tree loss would be required to facilitate safety clearances, but this would be minimal. Disturbance - The LWS is designated for supporting otter, a species sensitive to and legally protected from disturbance. The bridge proposals would not affect commuting / foraging activity along the watercourse, but there is the potential for natal holts to appear at any time and so there is the potential for disturbance to otter. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works. As set out in the Outline LEMP (document reference 7.4), pre-construction otter surveys would be undertaken a maximum of four months prior to the start of the construction works. Pre-construction surveys would inspect for breeding sites, holts, couches and resting places. If otter holts or other rest areas are found during pre-construction checks, an ECoW would review the scope of works and the	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Coggeshall Hall Farm LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. Potential for disturbance of otter utilising the site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Disturbance would last for the duration of the construction period where otter would likely avoid the area on a temporary basis, returning post-construction. The effects would be considered significant.	potential for effects on otter. If necessary, a licence would be sought from Natural England to allow works to continue. If an active natal holt is found within 150 m of the working area, ecological advice would be sought on how to avoid disturbance to otter. Access to the riparian corridor used by otter would be retained at all times. Effects to established otter paths and traditional routes such as field drains during the construction phase would be minimised. Excavations and trenches would be boarded or fenced if works are not completed daily. In exceptional circumstances, if trenches are required to be left open overnight then mitigation measures would be put in place to ensure otter cannot become trapped in them. This would include the provision of ramps or mammal ladders to ensure animals can exit excavations. This must be agreed in advance with the ECoW who would also be responsible for placing a means of egress in the excavations.	
Hallhook Row LWS (Section E) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-.
Rivenhall Thicks LWS (Section E) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-.
Sandy Wood LWS (Section E) also ancient woodland	High/National	The UK Power Networks (UKPN) access route to PSB38 would cross the River Ter. This watercourse flows adjacent to the LWS but does not form part of the designated site. (See also ancient woodland below.)	Hydrological - the construction of a single span bridge could cause deterioration of surface water quality through generation of silted or polluted runoff. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effects** on Sandy Wood LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
Great/Little Edney Woods LWS (Section F)	Medium/County	Partially within the Order Limits. The new 400 kV overhead line would over sail the LWS at its narrowest point. The site would also be crossed by a temporary haul road required for construction; this haul road would use an existing track through the LWS.	Habitat Loss - some tree removal would be required to facilitate electrical clearances, but this would be minimal. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effects** on Great/Little Edney Woods LWS.
Langley's Deer Park LWS (Section F)	Medium/County	Partially within the Order Limits. An eastern section of the site sits within the 400 kV overhead line Limits of Deviation (LoD) but located 30 m away from the current alignment. (See also GWDTE below).	Habitat Loss - some tree removal would be required to facilitate electrical clearances, but this would be minimal. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP. The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Langley's Deer Park LWS.
Osbourne's Wood LWS (Section F) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-.
Parson's and Queen's Wood LWS (Section F)	Medium/County	Adjacent to the Order Limits[7], the site is located adjacent to an existing 132 kV UKPN overhead line that would be removed and undergrounded. (See also ancient woodland Mann/Parson's Wood below.)	Habitat Loss - potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	The edge of the site would be demarcated to ensure no accidental encroachment into designated habitat as set out within the Outline CoCP (document reference 7.2).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Parson's and Queen's Wood LWS.
Writtlepark Woods LWS (Section F) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-.
Blind Lane LWS (Section G)	Medium/County	Within the Order Limits. Site is directly adjacent to permanent access track (right of access only – no physical works) and Public Right of Way diversion.	Habitat Loss - Potential for accidental encroachment. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	The edge of the site would be demarcated to ensure no accidental encroachment as set out within the Outline CoCP (document reference 7.2).	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Blind Lane LWS.

[7] This LWS GIS layer shows a very small part of the designation within the Order Limits, however this appears to be a mapping/scale error, as the small part of the designation within the Order Limits is an arable field.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
Bluntswall Wood LWS (Section G)	Medium/County	The haul road would cross (via single span bridge) a watercourse that flows directly into the LWS. The LWS is approximately 460 m downstream of the proposed crossing point.	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. This effect would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Bluntswall Wood LWS.
Botneyhill Wood LWS (Section G) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Clapgate Wood LWS (Section G) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
Little Bladen's Wood LWS (Section G) also ancient woodland	High/National	See habitat row relating specifically to the ancient woodland receptor in this table.	-	-	-
St Margarets Wood and Lane LWS (Section G) and ancient woodland	High/National	A narrow section of the LWS would be over sailed by the new 400 kV overhead line which would require some tree loss. A temporary haul road would cross the LWS which would require a temporary culvert within a ditch.	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss – 0.06 ha of lowland mixed deciduous woodland would be permanently lost, < 0.01 ha of bare ground, cereal cropland and developed land; sealed surface would be temporarily lost. 0.01 ha of lowland mixed deciduous woodland and 0.01 ha of other neutral grassland would also be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effects** on St Margarets Wood and Lane LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.		
Blackshots Nature Area LWS (Section H)	Medium/County	Existing pylons are located within the LWS. There would be minor works to the existing structures. Temporary haul roads would be required within the LWS to access the existing pylons.	Habitat Loss – < 0.01 ha of cereal cropland, 0.01 ha of developed land; sealed surface and 0.02 ha of other woodland; broadleaved would be permanently lost. 0.76 ha of other woodland; broadleaved and < 0.01 ha of cereal cropland would be temporarily lost. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Blackshots Nature Area LWS.
Buckingham Hill LWS (Section H)	Medium/County	Pylon TB258 would be positioned within the LWS and would therefore require a small area of temporary habitat loss during works and even smaller area of permanent habitat loss associated with the pylon base. Temporary features would be required during construction including a temporary haul road, pulling location and SuDS which would require temporary habitat loss. An existing track across the LWS would be used for ongoing maintenance (right of way only).	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss – 0.02 ha of lowland dry acid grassland would be permanently lost. 0.03 ha of developed land; sealed surface, 0.04 ha of gorse scrub, 0.58 ha of lowland dry acid grassland, 0.22 ha of lowland meadow, 0.01 ha of lowland mixed deciduous woodland, 0.7 ha of mixed scrub, 0.14 ha of OMH PDL, 0.92 ha of other neutral grassland, 0.02 ha of other woodland; broadleaved, and < 0.01 ha of modified grassland would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). Replacement tree planting would be undertaken outside of the electrical clearance distances but within the CWS or adjacent.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Buckingham Hill LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			medium negative effect and irreversible in the long-term. The effects would be considered significant.		
Linford Pit LWS (Section H)	Medium/County	The UKPN 132 kV overhead line working areas and a temporary UKPN diversion and overhead line works would be located within the LWS. The works would involve modification to one pylon and a new temporary pylon within the LWS. Some temporary habitat loss would be required. A permanent access route for the new Tilbury North Substation would lie adjacent to the north-western boundary of the LWS.	Habitat Loss – 0.05 ha of bare ground, 0.17 ha of lowland mixed deciduous woodland, 0.06 ha of mixed scrub, 0.07 ha of modified grassland, 0.31 ha of other neutral grassland, 0.48 ha of other woodland; broadleaved, 0.29 ha of ruderal / ephemeral and 0.01 ha of vacant or derelict land would be permanently lost. 0.13 ha of bare ground, 0.04 ha of developed land; sealed surface, 0.01 ha of modified grassland, 0.10 ha of other woodland; broadleaved, 0.07 ha of ruderal / ephemeral. 0.01 ha of tall forbs, and <0.01 ha of lowland mixed deciduous woodland, other neutral grassland and vacant or derelict land would be temporarily lost. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This effect would be considered significant.	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Linford Pit LWS.
Mucking Heath Complex, Southfields LWS (Section H)	Medium/County	Within the Order Limits. Pylon TB262 would be positioned within the LWS and would therefore require a small area of temporary habitat loss during works and even smaller area of permanent habitat loss associated with the pylon base. A temporary haul road would be required up to the pylon TB262 working area during construction. The existing 132 kV overhead line that currently crosses the LWS would be removed and undergrounded on either the existing alignment or different route (both considered) mostly outside of the LWS. The LWS would be crossed by a permanent access track required for ongoing maintenance (right of way only). This right of access	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. Habitat Loss – 0.2 ha of modified grassland and 0.02 ha of other woodland; broadleaved would be permanently lost. 0.01 ha of bare ground, 0.14 ha of lowland mixed deciduous woodland, 0.04 ha of mixed scrub, 1.2 ha of modified grassland, 0.21 ha of other woodland; broadleaved, 0.01 ha of other woodland; mixed, and <0.01 ha of other neutral grassland and tall forbs would be temporarily lost. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species.	Mitigation measures to protect water quality (commitment W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). The ECoW would give a briefing to the Main Works Contractor(s) working within the LWS on the ecological constraints ahead of works.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Mucking Heath Complex, Southfields LWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		would make use of an existing track.	Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.		
All other 336 local (non-statutory) sites designated for biodiversity.	Medium/County	No works within the ZoI for these sites.	None.	Not required.	None
Habitat					
Ancient woodland	High/National	**Bullen Wood (Section B)** – The CWS and ancient woodland site is adjacent to the Order Limits as it is located directly next to Bramford Substation. Permanent existing access route 4 m to the south (right of access only) for construction of pylons JC6 and JC7 for 400 kV overhead line. No works would be required for the permanent access route as an existing track would be used. South-east corner of woodland is within 8 m of 400 kV overhead line LoD extent but 52 m from current alignment. No direct loss of woodland is expected **Round Wood (Section B)** – The CWS and ancient woodland is within the Order Limits. The existing pylon PHB30 and associated 132 kV UKPN line would be removed from within the woodland. Excavation works required to remove concrete foundation of pylon PHB30, long-term benefit to woodland of removal. Permanent access route 4 m to the north (right of access only – no physical works) uses an existing route. **Rivenhall Thicks (Section E)** – The LWS and ancient woodland site is located within	Habitat - Regeneration following removal of third-party (UKPN) infrastructure. There is the potential for accidental encroachment of retained, existing woodland during these works. Potential habitat loss through accidental encroachment associated with this receptor in the absence of mitigation is considered to be a small negative effect in the short-term and reversable in the long-term, ultimately leading to a small positive through the removal of existing infrastructure allowing for natural regeneration of habitat. This effect would be considered significant.	The ancient woodland habitat would be allowed to regenerate naturally from the existing seed bank. The Arboricultural Clerk of Works (ArbCoW)/ECoW would give a briefing to the Main Works Contractor(s) working within the LWS/woodland on the ecological constraints ahead of works. The edge of the LWS/woodland would be demarcated to ensure no accidental encroachment as set out within the Outline CoCP (document reference 7.2). The implementation of the Outline Dust Management Plan set out within the Outline CoCP (document reference 7.2) would ensure no negative effects on ancient woodland because of dust. National Grid has made a commitment to no physical works or breaking ground within 15 m of ancient woodland where at all practicable, with demarcation measures to be used to ensure this 15 m buffer is not breached. The embedded and standard mitigation measures set out in the Outline LEMP (document reference 7.4) and the Ancient Woodland and Veteran Tree Strategy (Appendix B of the Outline LEMP (document reference 7.4)) would be sufficient to mitigate for effects on habitat. These would include minimally invasive excavation techniques, such as hand-digging, to protect root structures and the creation of roads using non-excavation construction techniques to minimise effects to the woodland habitat.	Following the application of mitigation, it is concluded that there would be an overall **negligible** impact with **no significant residual effect** on ancient woodland or their associated LWS/CWS.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		the Order Limits due the works area for existing 33 kV overhead line requiring removing and undergrounding of new cable 3 m from the woodland. Long-term benefit to the woodland is predicted because of removing the existing 33 kV line. A 100 m section of temporary haul road would be located within the 15 m buffer (8 m at closest point, 14 m at farthest point) to the north of the woodland. The haul road has a 4 m buffer either side and further 2 m either side for two-way vehicular movement and drainage. **Mann/Parson's Wood (Sections E and F)** – Parson's Wood is adjacent to the Order Limits[8] as part of existing 132 kV UKPN overhead line mitigation. The portion of overhead line that runs adjacent to the Order Limits (200 m) is due to be modified but would remain in- situ. A CSE platform is proposed 15 m from the woodland at its closest point; this is where the existing overhead line would transition to a new underground cable 36 m east of woodland at the closest point. No excavation is required within 15 buffer, but the works area LoD currently extending into the 15 m buffer. Pylon PSB42 would be dismantled, and 100 m of overhead line removed 35 m from the woodland at closest point. Pylon PSB43 would remain in-situ 31 m from woodland but will be modified,			

[8] This ancient woodland GIS layer shows a very small part of the designation within the Order Limits, however this appears to be a mapping/scale error, as the small part of the designation within the Order Limits is an arable field.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		the pylon work area has been minimised to maintain 15 m works buffer. While no excavation works are proposed within 15 m of the woodland and no loss of woodland anticipated, the works area LoD extends into the 15 m buffer. **Writtle-Writtlepark Woods (Section F)** – A LWS and ancient woodland site. The north-east corner of Bosmore Wood (part of the Writtlepark Wood complex) is partially within the Order Limits due to the removal and undergrounding of the 11 kV UKPN overhead line 4 m into the woodland. Undergrounding works would use delicate and precise techniques such as hand-digging or vacuum excavation to protect root structures. Bosmore Wood is also 14 m west, at the closest point, from a permanent access route (right of access only – no physical works) for construction of pylon TB180. **Round Wood (Section G)** – This CWS is identified as ancient woodland in its site description. The woodland would be 5 m north at its closest point to a permanent access route (right of access only – no physical works) for construction of TB205 for the 400 kV overhead line. This route follows an existing track. No direct or indirect habitat loss is expected. **Botneyhill Woods (Section G)** – The western corner of the woodland is approximately 9 m from the haul road works area. The woodland is separated from the haul road by the			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		existing Chase Farm Road which may already have minimised the Root Protection Area (RPA) of the woodland. **St Margarets Wood and Lane (Section G)** – This LWS is not mapped as ancient woodland on the ancient woodland inventory in MAGIC (Natural England, 2025) mapping, but the LWS description indicates the woodland contains ancient woodland features. The lane portion of the LWS passes through the Order Limits. The woodland would be 30 m west at its closest point to a permanent access route (right of access only – no physical works) for construction of pylon TB219. No direct loss of woodland is expected. **Little Bladen's Wood (Section G)** – This LWS is not mapped as ancient woodland on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping, but the LWS description indicates the woodland contains ancient woodland features. Little Bladen's Wood lies within the Order Limit. The Project includes the removal and undergrounding of part of an existing 132 kV overhead line which currently crosses the western corner. Pylon PUB40 sits in the northern fringe of the woodland and would require modification (not removal) to facilitate the undergrounding of the 132 kV further north. An access route lies 13 m into the woodland to access pylon PUB40 for these modification works. This would make use of the existing route used for ongoing maintenance to the existing line and no further			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		works to this access road are required.			
		Middle Wood, Offton (Section B) – Part of this SSSI is identified as an ancient woodland site. Woodland is 32 m from diverted centreline of UKPN third party mitigation of 132 kV overhead line (PI route) centreline and 15 m from the works swathe. No direct loss of woodland is expected. Middle Wood SSSI extent is within the Order Limits for works area of the dismantling of third party UKPN 132 kV route, however ancient woodland extent (as mapped on the inventory) is approximately 60 m into the woodland (and from the dismantling of 132 kV route) at closest point. **Great Newton Wood (Section B)** – This CWS and ancient woodland site is adjacent to the Order Limits; at its closest point it would be 43 m from the 400 kV overhead line. The site would be located 6 m from the permanent access route for UKPN access to pylon EEPK9 as part of their 132 kV overhead line mitigation. No works would be required for the permanent access route as it would utilise an existing track (right of access only – no physical works). No direct loss of woodland is expected. **Little Newton Wood (Section B)** – This CWS and ancient woodland site is adjacent to Hill House Lane 6 m from the woodland edge. This lane would be the permanent access route for UKPN access to pylon EEPK9 (right of access only – no physical works). No works required. No	Habitat Loss - There is the potential for modification or degradation of habitat through accidental encroachment. Potential habitat loss through accidental encroachment and dust associated with this receptor in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effect would be considered significant.	The Project has made a commitment to no physical works or breaking ground within 15 m of ancient woodland where at all practicable, with demarcation measures to be used to ensure this 15 m buffer is not breached. Of the 25 ancient woodlands identified here, embedded and standard mitigation measures as set out in the Outline LEMP (document reference 7.4) and the Ancient Woodland and Veteran Tree Strategy (Appendix B of the Outline LEMP (document reference 7.4)) would mitigate for effects on habitat. The implementation of the Outline Dust Management Plan set out within the Outline CoCP (document reference 7.2) would ensure no negative effects on ancient woodland because of dust.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on ancient woodland.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		direct loss of woodland is expected. **Somersham Park (Section B)** – This CWS and ancient woodland site is adjacent to the Order Limits. A permanent access route (right of access only – no physical works) for pylons RG201 and RG202 would be located 13 m from the woodland boundary. This access route utilises an existing track, so no works are required. The site would be 50 m from the 400 kV overhead line. No direct loss of woodland is expected. **Lower Wood (Section B)** – Woodland would be 6 m from the pulling location at pylon RG179, but 84 m from pylon RG179 itself. No direct loss of woodland is expected. **Miller's Wood (Section B)** – This CWS and ancient woodland site is partially within the Order Limits for Primary Access Route (PAR) H10-A2, H11-A1 and visibility splay. These PARs make use of the existing highway. The visibility splay runs past the southern edge of the woodland which is approximately 365 m on the existing Bullen Lane. As the visibility splay is situated on a pre-existing road, it is expected that there is likely already some degree of roadside management of vegetation in-place. Potential requirement to prune back overhanging vegetation. **Burstall Long Wood (Sections B and C)** – This CWS and ancient woodland site would be 50 m from the 400 kV overhead line. A permanent access route (right			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		of access only – no physical works) would be located 6 m from the woodland edge, this uses an existing track. No works required. No loss of woodland is expected. **Wenham Thicks (Section C)** This LWS and ancient woodland site would be located 5 m from a permanent access route (right of access only – no physical works) for pylons JC26 and JC27. No works required. No loss of woodland is expected. **Brimlin Wood (Section C)** – This CWS and ancient woodland site would be over 53 m from the 400 kV overhead line. No loss of woodland is expected. **Fiddler's Wood (Section D)** – This LWS and ancient woodland site would be located 2 m from a visibility splay along Fiddlers Hill from bellmouth TB-B045. Management of the vegetation along the road would be required to maintain the visibility splay in proximity to the woodland but no de-vegetation of woodland is proposed. No breaking ground works would be required. No direct loss of woodland is expected. **Aldham Hall Wood (Section D)** – This LWS and ancient woodland site would be over 50 m from the 400 kV overhead line. No loss of woodland is expected. **Church House Wood (Section D)** – This LWS and ancient woodland site would be over 44 m from the 400 kV overhead line. No loss of woodland is expected.			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		Stonefield Strip (Section D) This LWS is not mapped as ancient woodland on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping but the LWS description indicates ancient woodland features. The woodland boundary would be over 54 m from the 400 kV overhead line. The woodland would be 16 m from any excavation works associated with construction of the haul road but is 12 m from the haul road works area. A permanent access route (right of access only – no physical works) would be located 15 m from the woodland boundary. No direct loss of woodland is expected. **Harrow Wood (Section D)** – This LWS is not mapped as ancient woodland on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping but the LWS description indicates ancient woodland features. A permanent access route (right of access only) would be located on the fringes of LWS boundary, no works would be required for the permanent access route as an existing track would be used. An Environmental Area would be located adjacent to the woodland for habitat creation and enhancement measures only. There would be no other construction elements within 50 m. Woodland is 12 m west at closest point from overhead line LoD extent but over 150 m from current alignment and 18 m from current construction swathe. No loss of woodland is anticipated.			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		Sandy Wood (Section E) – This LWS and ancient woodland site is located 10 m from a permanent access route (right of access only – no physical works) for UKPN pylon PSB38 as part of their 132 kV overhead line mitigation. An existing track would be used. No loss of woodland is expected. **Hallhook Row (Section E)** – The LWS is located 0 m from 400 kV overhead line LoD extent but 49 m from current alignment. No direct loss of LWS or associated ancient woodland but potential for accidental encroachment. **Bushy Wood (Section F)** – This LWS and ancient woodland site is located adjacent to the Order Limits. A permanent access route (right of access only – no physical works) would be located 3 m from the woodland boundary at its closest point for construction of pylon TB151 as part of the 400 kV overhead line, though it would be 55 m from the woodland boundary. No direct loss of woodland is expected. **Writtle-James Spring (Section F)** – The woodland boundary to this LWS and ancient woodland site would be 5 m from a permanent access route (right of access only – no physical works) for pylon TB181. No direct loss of woodland is expected. **Sparrowhawk Wood (Section F)** – This LWS and ancient woodland site would be located 11 m from a permanent access route (right of access only – no physical works) for pylon			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		TB144. No direct loss of woodland is expected. **Border Wood (Section F)** – This LWS is identified as ancient woodland in its designated site description but not shown as such on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping. It is located 9 m from the Order Limits. No works to break ground would take place close to the woodland. Stringing works associated with pylon TB146 may take place 30 m from the woodland boundary (See also GWDTE below). No direct loss of woodland is expected. **Sheepcotes Wood (Section F) -** Sheepcotes Wood lies outside the Order Limits. The woodland is 10 m south-east at the closest point from permanent access route (right of access only) for maintenance of the 400 kV overhead line. No construction works are required for the permanent access. The woodland lies 40 m south-west of a temporary construction compound. The Order Limits run along the north of the woodland, with a 15 m buffer applied to the works areas. At one point the Order Limits are slightly closer (15 m) to provide flexibility for utility connections. **Osborne's Wood (Section F) -** This LWS and ancient woodland site would be over 53 m from the 400 kV overhead line. A permanent access route (right of access only – no physical works) for pylon TB183 would be located 11 m from the woodland boundary.			

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		No direct loss of woodland is expected. Potential for accidental encroachment. **Clapgate Wood (Section G) -** Excavations works within 15 m of the woodland (12 to 15 m away) is required to underground cabling for a third-party 11 kV overhead line mitigation. **Primstock (Section G)** – This LWS is not mapped as ancient woodland on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping, but the LWS description indicates that it contains ancient woodland features. A permanent access route (right of access only – no physical works) for construction of pylon TB213 would be located 7 m from this woodland's boundary. No direct loss of woodland is expected. **Ashen Shaw and Rainbow Wood (Section G)** – This LWS is identified as ancient woodland in its designated site description but not shown as such on the Ancient Woodland Inventory in MAGIC (Natural England, 2025) mapping. It would not be affected by the Project; see Section 8.6: Proposed Mitigation.			
Habitats of Principal Importance: Arable field margins Lowland meadows Lowland dry acid grassland Coastal and floodplain grazing marsh Reedbeds Ponds (Priority Habitat)	Medium/County	Habitats would be temporarily removed to create haul roads, temporary construction compounds and storage areas, and to accommodate the overhead line and underground cables. Habitats that are within the footprint of the permanent infrastructure that include pylons, the CSE compounds	**Temporary Habitat Loss:** Arable field margins – 11.39 ha Lowland meadows – 0.71 ha Lowland dry acid grassland – 4.71 ha Coastal and floodplain grazing marsh – 4.67 ha Reedbeds – 0.01 ha Ponds (Priority Habitat) – 0.18 ha Open mosaic habitats on previously developed land – 0.56 ha Lowland mixed deciduous woodland – 12.87 ha	Embedded mitigation has sought to avoid wherever practicable temporary and permanent loss of HPI. Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. The HPI that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Habitats of Principal Importance. The remaining approximately 12.5% to be surveyed and supplied as further environmental information will

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
Open mosaic habitats on previously developed land Lowland mixed deciduous woodland Wet woodland Native Hedgerows Rivers and streams (Priority Habitat)		and substations would be permanently removed.	Wet woodland – 0.04 ha Native Hedgerows – 29.07 km Rivers (Priority Habitat) – 1.28 km **Permanent Habitat Loss:** Arable field margins – 0.02 ha Lowland meadows – <0.01 ha Lowland dry acid grassland – 0.02 ha Coastal and floodplain grazing marsh – 0.02 ha Reedbeds – no permanent habitat loss Ponds (Priority Habitat) – no permanent habitat loss Open mosaic habitats on previously developed land – no permanent habitat loss Lowland mixed deciduous woodland – 14.94 ha Wet woodland – 0.05 ha Native Hedgerows – 1.14 km Rivers (Priority Habitat) – no permanent habitat loss Hydrological - Open cut crossings of watercourses would cause disturbance of bed sediments. Temporary habitat loss in the absence of mitigation is considered to be a medium negative effect and reversible in the medium to long-term due to natural regeneration that is expected to take place. Permanent habitat loss in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. The effects would be considered significant.	9 of the Outline LEMP (document reference 7.4). Mitigation for the permanent loss of habitat would be delivered through the creation/enhancement of habitat associated with BNG for the Project. Within the Order Limits six areas of land (defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the BNG target is reached, any additional creation/enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1) Replacement tree planting would be undertaken outside of the electrical clearance distances of the overhead line but within the impacted woodland or adjacent land which would be confirmed at detailed design. Shrub planting would be undertaken where necessary to replace trees to maintain ecological connectivity and maintain the electrical clearance distance from the overhead line and above the underground cable route. The design of temporary river crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	be mitigated for using the same approach and the results are not anticipated to change the residual effect.
All other ancient woodland sites within	High/National	No works within the ZoI for these sites.	None.	Not required.	None

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
200 m of the Order Limits.					
Species-rich 'Important' hedgerows[9]	Medium/County	5.36 km of species-rich '*Important'* hedgerows would be temporarily removed to create haul roads, temporary construction compounds and storage areas, and to accommodate the overhead line and underground cables. 0.03 km of species-rich hedgerows within the footprint of the permanent infrastructure that include pylons, the CSE compounds and substations would be permanently removed.	Temporary loss – 5.36 km Permanent loss – 0.03 km Temporary habitat loss in the absence of mitigation is considered to be a medium negative effect and reversible in the medium to long-term due to natural regeneration that may take place. Permanent habitat loss in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	The hedgerows that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Mitigation for the permanent loss of hedgerows would be delivered through the creation/enhancement of habitat associated with BNG for the Project. Within the Order Limits six areas of land (defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the BNG target is reached, any additional creation/enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1). Where practicable, replacement tree planting would be undertaken outside of the electrical clearance distances but within the impacted hedgerow (some may need to take place offsite). The design of temporary river crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on 'Important' hedgerows.

[9] These calculations are based solely on the ecological component of the Hedgerows Regulations 1997 criteria. Full condition assessments of all hedgerows have been undertaken and are presented in detail within the Biodiversity Net Gain Report (document reference 7.1).

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
GWDTE For the sites scoped in (see Section 8.5), they comprise four SSSIs, five LNRs, 26 CWSs and 26 LWSs[10]	High/National to Medium/County	The Project would cross watercourses that are hydrologically linked to these sites. See Appendix 8.1: Habitat Report (document reference 6.8.A1) for more details.	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. While trenchless crossings would avoid physical disturbance to the flow regime and form of channel and riparian corridors, the technique is not without risk of pollution, associated with inadvertent releases of drilling fluids/muds. Open cut crossings of watercourses could also cause disturbance of bed sediments. Potential for hydrological effects associated with this site in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. The effect would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on GWDTE.
Other terrestrial habitats Other lowland acid grassland Other neutral grassland Reservoirs Other broadleaved woodland Other mixed woodland	Low/Local	Habitats would be temporarily removed to create haul roads, temporary construction compounds and storage areas, and to accommodate the overhead line and underground cables. Habitats that are within the footprint of the permanent infrastructure that include pylons, the CSE compounds	**Temporary habitat loss:** Other lowland acid grassland – 0.21 ha Other neutral grassland – 124.20 ha Reservoirs – 0.23 ha Other broadleaved woodland – 6.17 ha Other mixed woodland – 0.58 ha **Permanent habitat loss:** Other lowland acid grassland – 0.00 ha Other neutral grassland – 3.84 ha	Embedded mitigation has sought to avoid wherever practicable temporary and permanent loss of habitat. The habitat that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Mitigation for the permanent loss of habitat would be delivered through the creation / enhancement of habitat associated with	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on other terrestrial habitats. The remaining approximately 12.5% to be surveyed and supplied as further

[10] The four SSSIs comprise: Aslacton Parish Land SSSI (Section A), Forncett Meadows SSSI (Section A), Flordon Common SSSI (Section A), Shelfanger Meadows SSSI (Section A). Note Flordon Common SSSI has been considered as a separate receptor above.

The six LNRs comprise: Roydon Fen LNR and CWS (Section A), Bramford Meadows LNR and CWS (Section B), Needham Lake LNR (Section B), Brockwell Meadows LNR (Section E), Chelmer Valley Riverside LNR (Section F) and Hutton Country Park LNR and LWS (Section G).

The 26 CWSs comprise: Bressingham Fen CWS (Section A), Brick Kiln Lane, Bunwell Hill CWS (Section A), Brock's Watering CWS (Section A), Bunwell Fen CWS (Section A), Carlton Rode Fen CWS (Section A), Dunston Common CWS (Section A), Flordon Meadow (East) CWS (Section A), Flordon Meadow (West) CWS (Section A), Hapton Common CWS (Section A), Horseford Meadow CWS (Section A), Muir Lane Meadow CWS (Section A), Tas Pond CWS (Section A), Tas Valley CWS (Section A), The Carr CWS (Section A), The Grange, Wreningham CWS (Section A), Wreningham Marsh CWS (Section A), Horse Fen CWS (Section A), Hall Farm Meadow CWS (Section B), River Gipping (Sections) CWS (Section B), River Waveney (Sections) CWS (Section B), Thrandeston Marsh CWS (Section B), Topcroft Farm Meadows CWS (Section B), Higham Meadow CWS (Section C), River Brett (Sections) CWS (Section C), Springhill Meadows CWS (Section C) and Wasses Marshes CWS (Section C).

The 26 LWSs comprise: Ardleigh Reservoir Grassland Local Wildlife Site (LWS) (Section C), Black Brook LWS (Section C), Bridges Farm LWS (Section C), Langham Water Works LWS (Section C), The Coombs LWS (Section C), Wall's Wood LWS (Section C), Fordham Bridge Meadow LWS (Section D), Marks Tey Brick Pit LWS (Section D), West Bergholt Alderwoods LWS (Section D), Blackwater Plantation LWS (Section E), Buckler's Farm Wood LWS (Section E), Coggeshall Hall Farm LWS (Section E), Feering Marsh LWS (Section E), Hoo Hall Meadows LWS (Section E), Tilkey Road Coggeshall LWS (Section E), Witham Marsh LWS (Section E), Border Wood Lake LWS (Section F), Broomfield – Little Waltham Chelmer LWS (Section F), Langleys Deer Park LWS (Section F), Little Waltham Village Meadows LWS (Section F), Lowley's Farm LWS (Section F), Writtle Bridge Meadow LWS (Section F), Hutton Country Park LWS (Section G), Little Burstead Wood LWS (Section G), Stock Brook Meadow LWS (Section G) and The Wilderness LWS (Section G).

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		and substations would be permanently removed.	Reservoirs – 0.00 ha Other broadleaved woodland – 3.9 ha Other mixed woodland – 0.14 ha Temporary habitat loss in the absence of mitigation is considered to be a medium negative effect and reversible in the medium to long-term due to natural regeneration that may take place. Permanent habitat loss in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. The effects would be considered significant.	achieving BNG for the Project. Within the Order Limits six areas of land (defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the target is reached, any additional creation / enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1). Replacement tree planting would be undertaken outside of the electrical clearance distances but within the impacted woodland or adjacent land.	environmental information will be mitigated for using the same approach and the results are not anticipated to change the residual effect.
Protected Species/Species of Conservation Concern (Vascular and Non-vascular Plants and Fungi)					
Aquatic macrophytes - galingale Jersey Cudweed	Medium/County	Galingale was recorded in the Roxwell Brook. The PAR (H29-A1) would cross this watercourse via an existing road bridge. The overhead line would over sail this watercourse, the haul road would be 14 m from the watercourse at its closest point and a permanent right of access would be established within the arable field adjacent to this watercourse. Tree and shrubs on the banks of the brook would need to be cut back to facilitate installation of the overhead line but there should be no need to affect in-channel vegetation. Jersey Cudweed is a species specially protected under Schedule 8 of the WCA, it was recorded close to existing Norwich Main Substation, in an area identified for permanent landscape mitigation. Plants were also recorded close to pylons TB8, TB7 and TB5. Jersey Cudweed is an annual species that relies on ground disturbance for its survival. No fungi that are protected or of conservation concern have	Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff, affecting water quality in the Roxwell Brook. Direct Loss – the Jersey Cudweed plants could be removed when the landscape planting is installed close to the existing Norwich Main Substation. Jersey Cudweed plants could also be removed when the underground cable is installed, or other works take place, near TB8, TB7 and TB5. As an annual species, Jersey Cudweed populations are subject to change with locations of plant populations changing in response to ground disturbance associated with agriculture and development activities. Based on the recorded locations of some of these plants it would be practicable to avoid direct loss of some of these plants as they are located close to the boundary of the Order Limits. As Jersey Cudweed is an annual plant, seeds germinate in response to ground disturbance, so the Project has the potential to lead to a short term increase in the number of plants in vicinity of pylons TB8, TB7 and TB5 as the installation of the underground cable nearby would lead to the creation of soil mounds likely to be suitable for the plants to seed into. Construction works may lead to the loss of this species in the absence of mitigation which is considered to be a medium negative effect and	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). Replacement tree planting would be undertaken outside of the overhead electrical clearance but close to the Roxwell Brook to ensure that its character is maintained. As set out in the Outline LEMP (document reference 7.4) a pre-construction walkover survey would be undertaken to identify and mark locations of protected plant and fungi species that would be affected by vegetation clearance, works to break ground and in-channel works. The results of this survey would determine whether effects to protected plant and fungi species such as Jersey Cudweed can be avoided through micro-siting. A Conservation Licence would need to be in place if it is necessary to excavate in areas that support the Jersey Cudweed plants. The purpose of this licence, if required, would be to ensure that populations of protected plant species are safeguarded throughout construction and during habitat reinstatement.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on vascular and non-vascular plants and fungi that are protected species or species of conservation concern.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		been identified within the Order Limits.	irreversible in the short-term. The effect would be considered significant.	If it were necessary to excavate any Jersey Cudweed plants, as it is an annual species, mitigation would either take the form of collecting seed from plants that are not affected and scattering them in areas of disturbed ground nearby or undertaking ground disturbance close to retained plants to encourage natural germination from naturally spread seed.	
Invasive Non-Native Species (INNS) - Plants					
Himalayan balsam Japanese knotweed Giant hogweed Japanese rose Variegated yellow archangel Wall cotoneaster Canadian waterweed	Not Applicable	The vegetation clearance, ground-breaking works and in-channel works associated with the Project have the potential to spread above ground plant fragments and below ground rhizomes, seeds and roots throughout the Order Limits.	Loss of Diversity - works that cause the spread of INNS plant species would have a negative effect on native flora and fauna, largely through the displacement of native species and plant communities. As aquatic INNS plant species are widespread across the Order Limits it would be assumed that all watercourses support these INNS. Construction works may lead to the spread of INNS in the absence of mitigation which is considered to be a medium negative effect and irreversible in the medium to long-term. The effect would be considered significant.	As set out in the Outline LEMP (document reference 7.4) a pre-construction walkover survey would be undertaken to identify and mark locations of INNS that would be affected by vegetation clearance, ground-breaking works and in-channel works. The implementation of biosecurity measures that would prevent the spread of INNS (both terrestrial and aquatic plant species) would ensure that that INNS are not spread by the Project. These mitigation measures (commitment reference B04) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the aquatic or terrestrial environment from invasive non-native plants.
Invasive Non-Native Species (INNS) - Aquatic					
Aquatic macroinvertebrates: Demon shrimp Signal crayfish	Not Applicable	The Project would cross a number of watercourses using open trench techniques and it is proposed to install 25 single span bridges. There are also many more crossings of field drains and ditches that may occasionally hold water, that are linked to these watercourses. Culverts would be temporarily installed where haul roads cross field drains and ditches, and tree works would be required to facilitate the installation of the overhead line across watercourses, field drains and ditches.	Loss of diversity - in-channel works within field drains, ditches and watercourses have the potential to cause the spread of INNS macroinvertebrates to all impacted watercourses within the Order Limits. This would have a negative effect on the native fauna and flora that would be displaced or killed by these species. As these species are widespread across the Order Limits it would be assumed that all watercourses support INNS. Construction works may lead to the spread of INNS in the absence of mitigation which is considered to be a medium negative effect and irreversible in the medium to long-term. The effect would be considered significant.	The implementation of biosecurity measures that would prevent the spread of INNS aquatic plant species would ensure that INNS macroinvertebrates are not spread by the Project. These mitigation measures (commitment reference B04) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the aquatic environment from invasive non-native aquatic macroinvertebrates.
Protected Species/Species of Conservation Concern (Fauna)					
Aquatic macroinvertebrates	High/National to Medium/County	The Project would cross a number of watercourses using	Hydrological - Soil stripping and the subsequent stockpiling and storage of soil	Mitigation measures to protect water quality (commitment reference W01 to	Following the application of mitigation, it is concluded that

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		open trench techniques and it is proposed to install 25 single span bridges. There are also many more crossings of field drains and ditches that may occasionally hold water, that are linked to these watercourses. Culverts would be temporarily installed where haul roads cross field drains and ditches, and tree works would be required to facilitate the installation of the overhead line across watercourses, field drains and ditches.	could cause deterioration of surface water quality through generation of silted or polluted runoff. While trenchless crossings would avoid physical disturbance to the flow regime and form of channel and riparian corridors, the technique is not without risk of pollution, associated with inadvertent releases of drilling fluids/muds. Open cut crossings of watercourses would also cause disturbance of bed sediments. Lighting leading habitat fragmentation – it was identified during consultation that bridging watercourses could have a significant effect on light sensitive species affecting their ability to navigate and breed. Potential for hydrological effects associated with this receptor in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored, with no lasting effect on the designated habitat or species. Potential for disturbance to light sensitive species in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Disturbance would last for the duration of the construction phase with species likely to return over time post-construction.	W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. The design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. To avoid negative effects on light sensitive invertebrates such as mayfly, caddisfly and stonefly, it has been agreed with the Environment Agency that soffit heights at clear span crossings would be set on a site-specific basis, following more detailed survey and design work by the appointed Main Works Contractor(s). Where there is evidence of the presence of sensitive invertebrate taxa, soffit heights would be set as high as practicable above the Q95 water level (indicative of a summer, low flow condition), accounting for site specific constraints, to facilitate the upstream migration of these species and avoid deterioration in the biological quality element. The 600 mm level would be the default height above water level, but the bridge height would be higher, where it is feasible, at good or high-quality aquatic invertebrate rivers in line with the WFD (see Section 8.5 for a list of watercourses of good or high quality).	there would be an overall **negligible** magnitude of impact with **no significant residual effect** on aquatic macroinvertebrates.
Terrestrial Invertebrates	Low/Local to Medium/County	Three sites that support habitat of value to terrestrial invertebrates would be affected by the Project, namely: • ISA 4 - Land north of Ling Road, Diss, Norfolk (Section A) - site of low value to invertebrates • ISA 24 - Land east of Nightingale Hill, Langham, Essex (Section C) - site of medium value to invertebrates • ISA 29 - Land west of Cressing Road, Witham,	Habitat Loss - the Project would result in the temporary and/or permanent removal of habitat of value to terrestrial invertebrates comprising: ISA 4 • 0.85 ha other neutral grassland temporarily lost (1.5% lost) • ISA 24 • 2.71 ha dry acid grassland temporarily lost (14.5% ISA lost) • 0.06 ha other neutral grassland temporarily lost (3% ISA lost) • 1.02 ha of lowland mixed deciduous woodland permanently lost (5% ISA lost)	Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4). During construction, targeted mitigation measures would be adopted at ISA 24 so that the temporary soil mounds created by the Project would be suitable for use by the Hymenoptera recorded on the site. As set out in the Outline LEMP (document reference 7.4), these works would be overseen by the ECoW who would give a briefing to the Main Works Contractor(s) working within the site on the ecological constraints ahead of works.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on terrestrial invertebrates.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		Essex (Section E) - site of low value to invertebrates At ISA 4, most of the habitat of greatest value to terrestrial invertebrates, namely the open habitats and tall sward and shrub habitats, would not be affected by the Project. Some scrub habitat would be cut back to facilitate installation of the overhead line. At ISA 24 the underground cable route would temporarily remove the grassland and permanently remove woodland habitat of value to terrestrial invertebrates, but most of the habitat within this site would not be directly affected by the Project. At ISA 29 the some of the open habitats and tall sward and scrub habitat of value to invertebrates would be temporarily removed to accommodate the haul road and the undergrounding of UKPN infrastructure, and some scrub vegetation would need to be cut back for electrical clearances associated with the 400 kV overhead line. Habitats of potential value to terrestrial invertebrates were recorded elsewhere within the Order Limits, some of which would be affected by the Project. The assessment was made that sufficient suitable habitat of similar quality and suitability would remain within the Order Limits in the immediate vicinity of the affected habitat that significant effects on the invertebrate population would not arise for the duration of the construction works. The reinstatement of habitats post-construction	At ISA 4, although a small area of other neutral grassland would be cleared, this area is very small in comparison to the rest of the site and would be reinstated post-development. This would have little to no significant impact on the rest of the invertebrate assemblage in the area. The underground cabling works at ISA 24 would affect an invertebrate population of medium value: an assemblage of nationally scarce Hymenoptera (wasps, bees and ants). In the absence of mitigation the temporary habitat loss associated with ISA 24 is considered to be a medium negative effect and reversible in the medium to long-term due to natural regeneration that may take place post-construction. The effects would be considered significant. At ISA 29, although some tree and shrub vegetation would need to be cut back to provided clearance for the 400 kV overhead line, this would not have a negative effect on the valuable invertebrate species recorded as they are associated with open unshaded habitats and not species associated with dense woodland or scrub. The temporary habitat loss elsewhere within the Order Limits would not have a significant effect on invertebrate populations.		

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		would ensure no long-term negative effects on terrestrial invertebrates. Habitats of value to terrestrial invertebrates within the remaining 33 ISAs within the Order Limits would not be negatively affected by the Project.			
Fish	Low/Local to Medium/County	The Project affects 38 WFD river catchments. Fish species of conservation concern and/or migratory species have been recorded in 28 of these catchments. Most of the watercourse crossings would affect ditches with only 33 crossing points identified as rivers, brooks or streams suitable to support fish. As part of the embedded mitigation the PARs and haul roads make use of existing road crossings to avoid effects to watercourses and their associated flora and fauna where practicable. Where it would be necessary for the haul road to cross a watercourse the width of the road has been reduced to 8 m to minimise effects to each watercourse. The underground cable would be installed beneath the River Stour using trenchless techniques and the haul road would cross using existing roads – it would not cross the River Stour. Where new watercourse crossings are required, haul roads would be located on culverts and clear span bridges that would not impede the movement of fish. Watercourse crossings made by open cut technique would be used to install underground cables on	Hydrological - Soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. This could directly harm fish causing mortality or negatively affect downstream spawning habitats. While trenchless crossings would avoid physical disturbance to the flow regime and form of channel and riparian corridors, the technique is not without risk of pollution, associated with inadvertent releases of drilling fluids/muds. Open cut crossings of watercourses could also cause disturbance of bed sediments. Mortality – installation of culverts and open trench cutting have the potential to cause mortality to fish or impede migration. Potential for hydrological effects associated with fish in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Potential for direct mortality of fish or impeding migration due to construction in the absence of mitigation is considered to be a medium negative effect and irreversible in the medium term. The length of time that the impact would be felt by the fish population would depend on the timing i.e., whether it affected fish when spawning, present as young fry or as adults and the extent and duration of any event. The fish population would be expected to recover once water quality was restored recolonising from adjoining habitats. Whilst no permanent effects on fish populations are likely, it may take several years, potentially up to five years, for populations to recover from a single event. The effects would be considered significant.	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. Mitigation measures to prevent harm to fish (commitment reference B11) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and in Section 8.6 of this chapter. . These mitigation measures would be overseen by an ECoW and would be adopted where in-channel works are required to avoid harm to fish and other aquatic fauna. Additionally, the design of temporary crossings would reduce temporary effects on the watercourses' flow regimes and channel forms. Clear span bridges would be used for larger crossings, where appropriate, these would ensure that the river edge remains undisturbed, but for most watercourse crossings culverts would be used as they are quick to install and dismantle. In-channel works required to facilitate haul road crossing are of short duration and, with mitigation measures in place to prevent harm to fish, would not affect fish migration. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4).	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on fish.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		minor watercourses for the 400 kV cables and undergrounding of the UKPN network.			
Reptiles	Low/Local to Medium/County	Habitat suitable to support reptiles is present across the full extent of the Order Limits where construction activities would take place within both the active and hibernation season. Habitat would be removed to facilitate construction either on a temporary basis, or permanent basis to allow for new permanent infrastructure such as pylons. Additionally, third-party (UKPN) infrastructure would be removed which would allow for small scale habitat regeneration.	Habitat Loss - The general population of reptiles which includes all habitat within the Order Limits was of low value to reptiles with the KRS identified considered to be of medium value. Embedded mitigation has ensured that as far as reasonably practicable the Project has avoided loss of either confirmed or potential KRS as well as other core quality reptile habitat such as grasslands, woodland, hedgerows, shrubs and dense vegetation, although there would be both permanent and temporary loss of habitat to facilitate the Project. The impact of habitat loss would be for the most part temporary, except for land required for permanent assets such as substation, CSE compounds and pylons. Killing/injuring of reptiles - there is the potential for the killing/injuring of reptiles through the direct removal of supporting habitat. In the absence of mitigation, harm to reptiles as stated above would be considered a medium negative effect in the short term but in the long term the reptile population would be expected to recover once habitat was restored recolonising from adjoining habitats. Whilst no permanent effects on reptile populations are likely it may take several years, potentially five to ten years, for populations to recover. The effect would be considered significant.	Reptile habitat that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Reptile Reasonable Avoidance Measures would be implemented at all areas of suitable reptile habitat under the supervision of the ECoW. Vegetation manipulation to degrade habitat ahead of works would be undertaken. Vegetation manipulation would involve a staged strimming regime to encourage reptiles to leave the working area and dissuade reptiles from re-entering the site. These displacement works would take place between March and November, during suitable weather conditions. Progressive cutting from the centre of the working area to the edges, taking care not to affect the ground surface, would encourage movement of reptiles into the adjacent habitats. Following the initial strimming works, potential sheltering and hibernation features would be removed by hand where size allows. This would include features such as log piles, branches and piles of stone and rubble. These would be placed in the adjacent habitats to provide alternative hibernacula for use by reptiles. Following completion of vegetation clearance, the vegetation in working areas would be kept short to prevent reptiles re-entering the area.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on reptiles.
Birds (Breeding Birds – General)	Low/Local to Medium /County	Habitat suitable to support breeding birds is present across the full extent of the Order Limits where construction activities would take place within the core breeding bird season (March to August inclusive). Habitat would be removed to facilitate	Habitat Loss - the general population of breeding birds which includes all habitat within the Order Limits was of low value to breeding birds with four survey locations of medium value. Embedded mitigation has ensured that as far as practicable the Project has avoided loss of core suitable breeding habitat such as woodland, hedgerows, shrubs, trees or dense vegetation although there would be both	Mitigation for the permanent loss of habitat would be delivered through the creation/enhancement of habitat associated with achieving BNG for the Project. Within the Order Limits six areas of land (defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the BNG target is	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on breeding birds.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		construction either on a temporary basis, or permanent basis to allow for new permanent infrastructure such as pylons. Additionally, existing UKPN infrastructure would be removed which would allow for small scale habitat regeneration.	permanent and temporary loss of habitat to facilitate the Project. The impact of habitat loss would be for the most part temporary, except for land required for permanent assets such as substations and pylons. The total permanent loss of habitat suitable to support breeding bird species is as follows: • Cropland – 53.9 ha • Grassland – 4.9 ha • Heathland and shrub – 0.3 ha • Sparsely vegetated land – 0.5 ha • Wetland (reedbed)– 0.2 ha In addition, a total of 22.46 ha of land would be either modified (to allow for the safe clearance of overhead lines through woodland), or removed and reinstated post-construction and managed as tall scrub habitat (UKHab heathland and shrub) so that the vegetation does not interfere with overhead lines in the future. This replacement habitat would provide habitat suitable for many woodland bird species and ensure connectivity between woodland, shrub and hedgerow habitats is maintained, but it would no longer support large or mature trees required by some bird species. Temporary habitat loss in the absence of mitigation is considered to be a medium negative effect and reversible in the medium to long-term due to natural regeneration that may take place. Permanent habitat loss in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term. This would not have a significant effect on breeding birds as there is sufficient alternative suitable nesting and foraging habitat in the vicinity of the Order Limits. Visual disturbance together with that from noise and vibration - this could lead to the temporary exclusion of birds from suitable retained habitat which may negatively affect the distribution (and potentially survival) of certain species. Sensitivity to disturbance varies between species. This displacement effect would be temporary and a small negative effect that is reversable in the medium term.	reached, any additional creation/enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1). The breeding bird habitat that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Where practical, habitat with the potential to support nesting birds would be removed/modified outside of the core breeding season (March – August inclusive). However, where this is not practicable mitigation measures have been set out in the Outline LEMP (document reference 7.4) where all areas to be affected would be checked for evidence of nesting birds 24 hours prior as standard. In some instances this may not be practical, therefore a maximum period of 48 hours is permitted, with contractors having a duty of care to look out for birds prior to undertaking vegetation clearance or tree felling works. If any active bird nests are discovered these would be given a minimum standoff of 5 m (this may increase depending on species, proposed works and location) where no potentially disturbing works would take place until the young have fledged and the nest vacated. Further nesting bird checks would be undertaken to ensure the vegetation does not contain any further active nests prior to removal works taking place. Where the Project passes through open fields during the period where an effect may occur, a nesting bird check would be carried out by an ECoW to establish whether ground nesting birds such as lapwing and skylark are nesting. If active bird nests are located, each nest would be marked and all potentially disturbing works within at least 20 m of each nest location would not take place until the active nest is vacated. Before works that could cause birds to abandon nests resume, further nesting bird surveys would be undertaken	The remaining two survey areas were assigned medium value / country importance as a precaution which will be surveyed and supplied as further environmental information, as detailed in Table 8.4. The mitigation will take the same approach and the results are not anticipated to change the residual effect.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			Killing/injuring of birds - there is the potential for the killing/injuring of birds through the direct removal of supporting habitat. The potential for mortality to breeding birds depends on the season that vegetation clearance takes place, and those species affected. In the absence of mitigation this could have a medium negative effect that would be reversable in the medium term on the breeding bird population. Collision of nocturnal species with machinery during construction – There is the risk that nocturnal birds (desk study results have identified owl species) may collide with construction machinery. The potential for mortality to nocturnal birds depends on the proximity of the works to nesting sites. In the absence of mitigation this would have a significant small negative effect on nocturnal birds that would be reversable in the medium term on the nocturnal bird population. This effect would be temporary and only last for the duration that works take place in the vicinity of any nest sites. At most it would have a significant negative effect on a receptor of local importance / low value. The above effects would be considered significant.	to establish that no active bird nests are present within the area. Outside of the trenchless crossings, construction work at night would typically only occur on rare occasions and would be likely to last for only a short duration at any one location. Construction lighting would be limited to contained sites, such as the temporary construction compounds and specific sites within the Order Limits. The speed of plant would be restricted, and work areas would be lit for safety reasons if used after dark. The collision risk of nocturnal species with construction machinery once this mitigation is applied is therefore negligible.	
Schedule 1 Birds	Low/Local	Habitat suitable to support Schedule 1 birds is present throughout the Order Limits where construction activities would take place within the core breeding bird season (March to August inclusive). Habitat would be removed to facilitate construction either on a temporary basis, or permanent basis to allow for new permanent infrastructure such as pylons.	Barn Owl As shown on Figure A8.7.14: Barn Owl Constraints Map in Appendix 8.7: Breeding Bird Report (document reference 6.8.A7) there is either confirmed or the potential for direct loss of 10 confirmed or potential roosting sites and the potential to disturb two confirmed nests, five confirmed roosts and a further 16 potential roosting features all located within 30 m of construction activities. These comprise the following: • **Direct loss** - One confirmed roost site for barn owl (Lat/long coordinates: 51.935517-0.83848) off Crabtree Lane, Great Horkesley due to bellmouth road widening. • **Potential for direct loss** - Four confirmed roosts (Lat/long coordinates: 51.642619-0.389873, 52.529828-1.199987, 51.694912-0.404868 and 52.042466-1.065279) and five potential roosts (Lat/long coordinates: 51.881413-0.744245,	General Where practicable, habitat with the potential to support breeding Schedule 1 birds would be removed/modified outside of the core breeding season (March – August inclusive). However, where this is not practicable mitigation measures have been set out in the Outline LEMP (document reference 7.4) where all areas to be affected would be checked for evidence of nesting birds 24 hours before as standard (no more than 48 hours) prior to vegetation removal or tree felling works taking place. If any active bird nests are discovered these would be given an appropriate standoff distance (this may increase depending on species, proposed works and location) where no potentially disturbing works would take place until the young have fledged and the nest vacated. Further nesting bird checks would be undertaken to ensure the vegetation does	Following the application of mitigation, it is concluded that there would be an overall negligible magnitude of impact with no significant residual effect on birds that are specially protected when nesting under Schedule 1 of the WCA.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			51.641178-0.388657, 51.713878-0.413512, 51.935753-0.980287 and 52.090192-1.024408) It is thought that micro-siting may mean that they can be retained. • **Disturbance** – Two confirmed nests (Lat/long coordinates: 51.611834-0.380471 and 51.485103-0.396544). Five confirmed roosts (Lat/long coordinates: 52.524458-1.190374, 52.041596-1.06301, 52.067665-1.076818, 52.262286-1.057515 and 52.372212-1.081454). 16 potential roosting features (Lat/long coordinates: 51.548539-0.388318, 51.638329-0.388593, 52.559874-1.256107, 51.547519-0.38878, 52.222555-1.056806, 52.103121-1.002085, 51.610803-0.378421, 51.912968-0.804383, 51.975376-0.969522, 52.39211-1.074288, 51.976773-0.966348, 52.067374-1.058103, 52.303198-1.053538, 52.392185-1.074149, 52.304577-1.049973 and 52.560195-1.261817). Hobby As shown on Figure A8.7.16: Hobby Constraints Map in Appendix 8.7: Breeding Bird Report (document reference 6.8.A7) one confirmed breeding hobby was identified adjacent to the proposed Tilbury North Substation in a retained tree which would be at risk of disturbance if this nest is occupied when as construction works or vegetation clearance commence. Kingfisher As shown on Figure A8.7.17: Kingfisher Constraints Map in Appendix 8.7: Breeding Bird Report (document reference 6.8.A7) two potential kingfisher nesting sites were identified within retained habitat but at risk of disturbance due to the proximity to construction activities. One at Lat/long coordinates 52.042446-1.0644668 (Spring Brook near Ipswich) and another at 52.103160-1.0231362 (The Channel, Offton). Red Kite As shown on Figure A8.7.20: Red Kite Constraints Map in Appendix 8.7: Breeding Bird Report (document reference 6.8.A7), three red kite territories may be impacted. A tree that falls within a breeding red kite territory would be removed (Lat/long coordinates: 51.935517-	not contain any further active nests prior to removal works taking place. Mitigation for the permanent loss of habitat would be delivered through the creation/enhancement of habitat associated with achieving BNG for the Project. Within the Order Limits six areas of land (defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the BNG target is reached, any additional creation/enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1). The breeding bird habitat that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Barn Owl A pre-construction check of potential or confirmed barn owl roosting/nest sites (trees) by a licensed barn owl ecologist would be undertaken. If no active barn owl nest is found, the potential nesting feature would be temporarily blocked or the tree removed (if that is required to facilitate the Project) and alternative barn owl boxes installed nearby. If an active barn owl nest is identified, then a 50 m works exclusion buffer would be applied and maintained until the young have fledged. Seventeen artificial barn owl boxes are proposed (10 for direct loss and a further seven for disturbance) which would be installed on either a suitable retained tree or pole. Mitigation measures have been set out in the Outline LEMP (document reference 7.4). Kingfisher Where watercourse crossings are required, a pre-construction kingfisher survey would be undertaken by an ecologist prior to works 50 m up and downstream of the crossing to determine if the banks are suitable to support breeding	

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			0.83848) off Crabtree Lane, Great Horkesley due to bellmouth road widening. The tree also supports a confirmed barn owl roost. Two additional territories were identified with retained woodlands adjacent to construction works which may be at risk of disturbance. The first was a possible breeder (Lat/long coordinates: 51.940457- 0.97652684) and the second was a confirmed breeder (Lat/long coordinates: 52.476414-1.1349669). General Direct loss of nesting/roosting features - some species of Schedule 1 birds such as barn owl, hobby, red kite and kingfisher are less flexible with their breeding habitats and would typically require certain features such as tree hollows, platforms or banks to nest in. Habitat loss in the absence of mitigation is considered to be a medium negative effect and irreversible in the long-term with those features often only found in mature (typically ancient/veteran) trees. This would not have a significant effect on overall population as there is sufficient alternative suitable nesting and foraging habitat in the vicinity of the Order Limits. Killing/injuring of Schedule 1 birds – There is the potential for the killing/injuring of birds through the direct removal of supporting habitat. In the absence of mitigation this could have a medium negative effect that would be reversable in the medium term on the breeding bird population. Visual disturbance together with that from noise and vibration - this could lead to the temporary exclusion of birds from suitable retained habitat which may negatively affect the distribution (and potentially survival) of certain species. Sensitivity to disturbance varies between species. This displacement effect would be temporary and a small negative effect that is reversable in the medium term. The effects as above would be considered significant.	kingfisher. If the habitat is suitable, a further kingfisher survey would be undertaken by suitably qualified ecologist to confirm breeding and establish a buffer of at least 20 m. Works within this buffer would be delayed until confirmation of the chicks fledging, or the nest is abandoned. If a kingfisher nest is found to be directly lost during the construction phase, depending on the level of alternative bankside habitat available, the provision of an artificial kingfisher tunnel may be required.	
Birds (Wintering/Passage Birds)	Low/Local to Medium/County	Habitat suitable to support wintering/passage birds is present across the full extent of the Order Limits where construction activities would	Habitat Loss - the general population of wintering/passage birds includes all habitat within the Order Limits. The effect of habitat loss would be for the most part temporary with	Mitigation for the permanent loss of habitat would be delivered through the creation/enhancement of habitat associated with BNG for the Project. Within the Order Limits six areas of land	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant**

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		take place. Habitat would be removed to facilitate construction either on a temporary basis, or permanent basis to allow for new permanent infrastructure such as pylons. Additionally, existing UKPN infrastructure would be removed which would allow for small scale habitat regeneration. Construction works taking place within proximity to Langham Lake (adjacent to the River Stour) and Ardleigh Reservoir (Section C).	birds far more mobile during the winter as they move through the landscape in search of food. This habitat loss would have a small negative effect on wintering birds lasting for the duration of the construction works (medium term) in proximity to habitats that support wintering species. In the absence of mitigation this effect would be significant but reversable. Visual disturbance together with that from noise and vibration - this could lead to the temporary exclusion of birds from the retained wetland habitat which may negatively affect the distribution (and potentially survival) of certain species. Sensitivity to disturbance varies between species. This displacement effect would be temporary and a small negative effect that is reversable in the medium term. Noise and visual disturbance - would have a temporary effect on wintering birds lasting for the duration of the construction works in proximity to habitats that support wintering species. In the absence of mitigation there would be a small negative effect that is reversable in the medium term.	(defined as Environmental Areas) are proposed around the Project's permanent assets, where there is sufficient space. To ensure the BNG target is reached, any additional creation/enhancement would be delivered outside of the Order Limits, as identified in the Biodiversity Net Gain Report (document reference 7.1). The wintering bird habitat that would be lost on a temporary basis would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). Standard mitigation measures have been included within Outline CoCP (document reference 7.2) to mitigate for the potential effects including (but not limited to) GG22, GG31.	**residual effect** on birds that are wintering or on passage.
Bats (Foraging and Commuting)	Medium/County and Regional to High/National	The Project would impact bat foraging and commuting routes, leading to temporary severance/fragmentation of these routes. For sections with overhead line, where the haul road passes through all hedgerows the construction corridor would be reduced from 21 m to 12 m in width. For sections with underground cables (open cut) at hedgerow crossings the working area would typically be reduced from 120 m to 70 m in width. This would be reduced further, where practicable, to the footprint of the cable swathe and haul roads. These reductions in the width of the working area are achieved through the avoidance of creating soil	Habitat severance/fragmentation - affecting foraging and commuting routes used by *Pipistrellus* spp., brown long-eared bat, noctule bat and Leisler's bat. Given the widespread distribution, increasing/stable populations and available suitable habitat for *Pipistrellus* spp. and brown long-eared bat, the habitat effects derived from the Project would not significantly affect the favourable conservation status of these species. While noctule bat and Leisler's bat are not as common as *Pipistrellus* spp. and brown long-eared bat they are widespread across England and have increasing/stable populations and available suitable habitat. Noctule bat and Leisler's bat typically fly high over open space away from vegetation, often commuting over open habitats. As such vegetation clearance caused by the Project would not have a significant negative effect on *Pipistrellus* spp., brown long-eared bat, noctule bat and Leisler's bat.	As part of the embedded mitigation for the Project on completion of works, irrespective of bat usage, replacement planting of all bat foraging and commuting corridors would be undertaken. As a minimum native hedgerow and scrub planting would restore linear features that provide bat foraging and commuting routes. Temporary impacts to habitats such as gaps in hedgerows to allow for construction access would be reinstated in line with the habitat reinstatement principles set out in Section 9 of the Outline LEMP (document reference 7.4). No additional mitigation specifically relating to habitat effects on the activity of *Pipistrellus* spp., brown long-eared bat, noctule bat and Leisler's bat is required. The implementation of the embedded mitigation measures outlined above relating to habitat reinstatement would ensure no long-term negative effects on barbastelle, serotine and *Myotis* spp., because of the Project.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on foraging or commuting bats.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		storage mounds close to hedgerows and storing soils elsewhere along the route. Some additional tree or shrub pruning would be required to facilitate visibility splays at bell mouths.	Habitat severance/fragmentation - affecting foraging and commuting routes used by barbastelle, serotine and *Myotis* spp. There is the potential for significant effects to arise as a result of fragmentation of foraging and commuting routes used by these species at the following static detector survey locations: 2, 3, 5, 8, 14, 16, 21, 24, 25, 28, 30, 32, 35, 41, 42, 50, 51, 52, 54, 56, 58, 60 and 62 (as shown on Figure A8.10.1: Bat Static Deployment 2023 - 2025 in Appendix 8.10: Bat Activity Report (document reference 6.8.A10)). A breakdown of bat activity (passes per hours) at each location is set out in Table A8.10.17 of Appendix 8.10: Bat Activity Report (document reference 6.8.A10). Significant effects have also been assumed at a further at 11 (statics 61,61 and 65-73) locations (as a worst-case scenario) which have not been reported on in the ES (Volume 6 of the DCO application) but surveyed post March 2025 (to be provided as further environmental information). The locations are the following: • 61 and 64 (as shown on Figure A8.10.1: Bat Static Deployment 2023 - 2025 in Appendix 8.10: Bat Activity Report (document reference 6.8.A10)). • TM 15543 95150 (65) • TM 10242 77012 (66) • TM 10290 76402 (67) • TM 03175 34106 (68) • TM 02633 33915 (69) • TM 02205 33327 (70) • TM 02431 33034 (71) • TL 86238 20973 (72) • TL 72586 14957 (73). The lowest effects derive from 12 m swathe of vegetation removal (including hedgerows), allowing for 8 m wide haul road and 2 m either side for two-way vehicle movements and drainage. Other effects include vegetation removal for overhead lines and the largest effects deriving from 120 m swathe of vegetation removal for underground cabling.	During construction, to avoid significant effects to barbastelle, serotine and *Myotis* spp., temporary artificial bat flyways would be installed each night during the bat active season from May to September inclusive to maintain habitat connectivity. Each temporary bat flyway would be erected prior to the removal of habitat and would comprise standard Heras fencing panels (approximately 2 m in height) covered on both sides by reed screening (or similar such as willow or camouflage netting). As far as practicable, the screening would cover the entire height and width of each panel to create a fence which is at least 2 m high, without gaps, covering the section of habitat to be removed. Where applicable to haul roads associated with the overhead line, flyways would be installed either side of the road, to ensure the gap in vegetation is no bigger than 6 m. On completion of the construction phase, the habitat would be reinstated, and the temporary flyway removed. These mitigation measures have been set out in the Outline LEMP (document reference 7.4). As a precautionary measure, the above mitigation will also be applied at 9 additional locations surveyed post March 2025 and to be reported on as further environmental information, as detailed in Table 8.4.	

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			Effects were grouped into two groups (≤15 m or >15 m).[11] Where activity was high and effects are >15 m there is the potential for significant negative effects on barbastelle/*Myotis*, that would last for the duration that the habitat remains fragmented. Serotine are known to fly in more open habitats and so significant negative effects would arise where they were recorded in high numbers and effects >15 m. In the absence of mitigation, there is the potential for medium negative effect on the barbastelle/*Myotis*/serotine populations a result of habitat fragmentation and this effect would last for as long as the habitats remain fragmented. Assuming some natural regeneration would take place, this would be reversable in the medium to long- term. The effect would be considered significant.		
		If construction works take place at the time when bats are active there is the potential for disturbance to bats through construction noise, vibration, lighting and vehicle movement.	Mortality - as bats usually emerge when it is dark they are unlikely to encounter construction works for most of the year as works would be restricted to daylight hours, with more limited works proposed to take place at night. Bats can be active during the core working day in the spring and autumn when daylight is still limited. In the absence of mitigation there is potential for medium negative effects on bats because of noise and visual disturbance or due to collision. These effects would last for the duration of construction works (medium-term) in the vicinity of commuting routes and foraging corridors. The effect would be considered significant.	Standard mitigation measures have been included within Table 6.1 of the Outline CoCP (document reference 7.2) to mitigate for the potential effects including (but not limited to) GG22, GG31 and B06. For most of the Project, construction work at night would typically only occur on rare occasions and would be likely to last for a short duration at any one location. Construction lighting would be limited to contained sites, such as the temporary construction compounds and specific sites along the alignment. The speed of plant would be restricted, and work areas would be lit if used after dark for safety reasons.	
Bats (Roosting)	Low/Local to Medium/County	Tree removal would be required to facilitate construction. Trees within 87.5% of the land within the Order Limits were surveyed for their suitability to support bats. A total of 1,290 trees within the surveyed area were identified	Direct loss of tree roost - leading to the loss of suitable habitat to support bats or the injury/mortality of bats. Disturbance through construction noise, vibration, lighting and movement (affecting all bat species). This disturbance may result in temporary localised exclusion of bats from roosting habitat, particularly during the spring	Prior to removal updated ground-based bat tree assessments of all impacted trees would be undertaken pre-construction, once detailed design has confirmed which trees would require removal or significant tree management works. Following the ground-based assessment update, aerial inspections/emergence	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on roosting bats.

[11] The 15 m assessment was used following review of existing projects, which found that bat species in the UK will continue to commute along linear habitat, despite a gap of 15 m. Hinkley C Connections project was considered a sufficient case study given the presence of horseshoe bats and the nearby North Somerset and Mendip Bats SAC and Mendip Limestone Grasslands SAC. Horseshoe bats (which are not present in East Anglia) are far more sensitive to the severance / fragmentation of linear habitat.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		that have the potential to support roosting bats (comprising 116 PFR-M, 278 PRF-I, and 896 FAR). A further 12.5% of the land within the Order Limits is to be surveyed in 2025 and based on the completed survey data it has been assumed that a further 184 trees would be removed and that these would include 40 trees that are PRF-I and 17 trees that are PRF-M. There is also the potential that retained trees that support bats would be at risk of disturbance from construction activities. A total of 35 trees with PRF-I and 17 with PRF-M that would be retained, are within the 20 m ZoI for disturbance.	and autumn when daylight is still limited during the core working day, and bats may be active. In the absence of mitigation, the direct loss of roost features and disturbance to roosting bats would have a permanent medium negative effect (large negative in the event of a loss of a maternity roost – mortality) that would be irreversible (in the event of mortality) or reversible in the medium-term if bats are not present at the time of removal. Bats are known to frequently change roost locations and may seek alternative, retained roosting resources within the Order Limits. Effects would be considered significant.	surveys where PRF-M features have been identified would be undertaken. These surveys would be undertaken in advance of construction works within proximity to a tree with a PRF to identify bat roost species, size and type. Surveys would be undertaken in line within May-October as stated in the guidelines (Collins, 2023). Any direct loss of a known bat tree roost would be carried out under a Natural England licence. A 20 m exclusion buffer would be demarcated at any known bat roosts when works are occurring nearby, to ensure no accidental encroachment of construction activities that may cause a disturbance impact. Where trees containing bat roosts require felling, a programme of exclusion to ensure that no bats remain within the roost prior to felling would be implemented. This would be undertaken in accordance with the methods detailed within the Natural England licence. A programme of installation of replacement bat roosting habitat (e.g. bat boxes) on nearby retained trees would be undertaken in line with requirements set out in the Natural England licence. This is likely to be a two replacement artificial bat boxes for every one roost lost. Standard mitigation measures have been included within Outline CoCP (document reference 7.2) to mitigate for the potential effects including (but not limited to) GG22, GG31 and B06, as previously listed in Section 8.6. For most of the Project construction work at night would typically only occur on rare occasions and would be likely to last for a short duration at any one location. Construction lighting would be limited to contained sites, such as the temporary construction compounds and specific sites along the route.	The remaining approximately 12.5% of the Order Limits to be surveyed is assumed to support tree roosts of low to medium value / local to county value as a precaution. They will be surveyed and supplied as further environmental information as detailed in Table 8.4. The mitigation would take the same approach and the results are not anticipated to change the residual effect.
Hazel Dormouse	Medium/County	As shown on Figure A8.12.1: Dormouse Desk Study Records, Survey Areas and Positive Results in Appendix	Habitat fragmentation and mortality - removal of habitat known to support hazel dormouse has the potential to cause mortality and could create gaps that hazel dormouse need to cross	The embedded mitigation sought to avoid woodland habitat as much as practicable to minimise effects on species like hazel dormouse.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		8.12: Hazel Dormouse Report (document reference 6.8.A12), eight sites were identified where removal of habitat suitable for hazel dormouse would take place and the presence of hazel dormouse was confirmed through survey. At Dormouse Site 1 (Section B), 70 m of scrub/woodland would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance. The haul road would follow a different route where there are no trees or shrubs. At Dormouse Site 2 (Section B), 70 m of woodland and two hedgerows would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance. The haul road would not affect dormouse habitat. At Dormouse Site 25 (Section B), 80 m of woodland would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance. The haul road does not affect dormouse habitat. An existing UKPN line (PKF) passes through woodland and this woodland would be affected if the underground cable follows the same route, in which case the works would affect habitat that is already affected by woodland management works. At Dormouse Site 18 (Section F), a 30 m-wide belt of trees and two hedgerows would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance.	at ground level putting them at increased risk of predation. This could lead to the local extinction of a resident hazel dormouse population. The habitat loss would be temporary lasting for the duration of the construction period as habitats would be reinstated on completion of the works. The larger areas of vegetation removal would involve cutting back vegetation to facilitate installation of the overhead line that would not require the complete removal of the vegetation. Where clearance to ground level is required to install the temporary haul roads the effects to hedgerows and woodland would be minimised with the road reduced to 12 m in width. In the absence of mitigation, the vegetation manipulation required to install the overhead line, and the temporary installation of the haul roads would have a small negative effect on the hazel dormouse population that would be reversable in the medium-long term once habitat re-establishes. This effect would be felt by the hazel dormouse population for as long as the habitat remained unsuitable for use by hazel dormouse; vegetation that has been cut back would be suitable for hazel dormouse within five years. There would be no permanent removal of habitat proven to be used by hazel dormouse. The effect would be considered significant.	As set out in Section 6 of the Outline LEMP (document reference 7.4), removal and manipulation of habitat known to support hazel dormouse would take place under licence to Natural England (the current licensing body), with details to be approved by Natural England. Vegetation removal would be overseen by the licensed ecologists with removal staged to enable vegetation to be searched for dormouse before it is cut to ground level, with further searches to confirm the absence of hazel dormouse before stumps are moved and the area identified as '*free*' of constraints. Nest boxes would be installed in areas of retained vegetation to mitigate for the loss of natural nest sites. As set out in Section 6 of the Outline LEMP (document reference 7.4), where the presence of hazel dormouse has not been confirmed, but there are historical records to linked habitat and large areas of habitat suitable for hazel dormouse need to be removed i.e., more than 1.5 ha of woodland or more than 300 m of hedgerow, a two-stage approach to vegetation removal would be undertaken. Vegetation would be cut to ground level in the winter months and stump extraction, if required, would occur in the period April to October. These works would be overseen by an ECoW. As set out in Section 6 of the Outline LEMP (document reference 7.4), where the presence of hazel dormouse has not been confirmed, but there are historical records to linked habitat and small areas of suitable habitat need to be moved i.e., less than 1.5 ha of woodland or less than 300 m of hedgerow, then the ECoW would undertake hand searches for hazel dormouse and their nests. A two-stage approach to vegetation clearance would be undertaken to facilitate the search. Where confirmatory signs of hazel dormouse are found, clearance works would cease in the locality until a licence is obtained and then works would proceed in accordance with the licence. Where no signs are recorded and the ECoW identified the area as free	impact with **no significant residual effect** on hazel dormouse.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		The haul road would use an existing gap in the vegetation and would not affect hazel dormouse habitat. At Dormouse Site 19 (Section F), a 15 m-wide belt of trees and two hedgerows would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance. The haul road would also cross the belt of trees. At Dormouse Site 20 (Section F), a hedgerow would be over sailed by the overhead line, the vegetation along this route would need to be cut back for electrical clearance, although the hedgerow is low and so the requirement for vegetation management appears to be limited. The haul road would pass through an existing gap within the hedgerow. At Dormouse Site 21 (Section G), one hedgerow tree may be affected by scaffolding installed to protect installation of the overhead line across a road. A separate hedgerow would be over sailed by the overhead line, the vegetation adjacent to this route would need to be cut back for electrical clearance. Whilst Dormouse Site 22 (Section G) would not be directly affected by the Project, as it is outside the Order Limits, it is linked to woodland habitat within the Order Limits that would be affected by works to an existing BT line that if it were to be undergrounded on the same route would affect this woodland habitat. The footprint of a BT cable is minimal, but temporary		of constraints then clearance to ground level would proceed and stump extraction, if necessary, would occur.	

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		vegetation removal may be required.			
Otter	Medium/County	11 features were identified as confirmed or potential otter holts/resting sites. Vegetation clearance associated with the overhead line would affect features identified as confirmed or potential otter holts/resting sites The haul roads, open cut crossings for underground cable, trenchless techniques and the overhead line would cross dry and wet ditches, watercourses and other linear corridors that otter would use when travelling about their range. Otter is expected to be present throughout the Order Limits.	Embedded mitigation has ensured that five of these features are sufficiently distant from the Project to not be directly or indirectly affected (labelled O3, O5, O6, O7 and O8 on Figure A8.13.2: Otter Field Survey Results within Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13)). Hydrological - soil stripping and the subsequent stockpiling and storage of soil could cause deterioration of surface water quality through generation of silted or polluted runoff. With reference to the crossing of the River Stour, while trenchless crossings would avoid physical disturbance to the flow regime and form of channel and riparian corridors, the technique is not without risk of pollution, associated with inadvertent releases of drilling fluids/muds. Open cut crossings of watercourses would cause disturbance of bed sediments. Any negative effects on water quality would affect the prey items that support otter. Potential for hydrological effects associated with otter in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Effects would last for the duration poor quality water reached the site but would start to dissipate as soon as water quality was restored. The vegetation would be expected to recover within the year once water quality was restored. Disturbance - cutting back vegetation to facilitate the installation of the overhead line could affect vegetation that provides cover for otter travelling about their range particularly if it occurs in the vicinity of an otter holt or resting site. Otter is legally protected from disturbance. Disturbance impacts are anticipated at O1, O2, O4, O9, O10 and O11 (Figure A8.13.2: Otter Field Survey Results in Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13). Potential for disturbance of otter in the absence of mitigation is considered to be a small negative effect and reversable in the medium term. Disturbance would last for the duration of the construction period where otter would likely	Mitigation measures to protect water quality (commitment reference W01 to W16) are identified in Table 6.1 of the Outline CoCP (document reference 7.2) and Section 8.6 of this chapter. The implementation of these mitigation measures would ensure that water quality is protected and avoid negative effects to otters and their prey. As set out in Section 6 of the Outline LEMP (document reference 7.4), pre-construction surveys would be undertaken to inspect resting sites to confirm their status with respect to use by otter. No works would take place within 150 m of an active natal holt. For all other holts/resting places a 30 m disturbance buffer has been agreed with Natural England. Works that require the removal of a holt and/or works that have the potential to cause disturbance to otter would take place under licence to Natural England. Mitigation measures put in place to ensure that badgers have safe passage across the Order Limits would also ensure that otter has safe passage. This would include mitigation measures to ensure that site fencing is permeable to otter and mitigation measures to prevent mammals from being trapped in excavations would be suitable for otter. Care would be taken to ensure that storage areas that pose a hazard to wildlife such as otter are appropriately fenced and/or secured to ensure no harm. Speed limits would be in place along the haul road, which would minimise the risk of collision with machinery within the Order Limits.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on otter.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			avoid the area on a temporary basis, returning post-construction. Disturbance to natal holts would have a large negative effect on otter and could affect their breeding success. Given the scale of the Project this could affect the population of county importance and medium value that would be felt by the otter population for the duration that works take place (medium term) in the vicinity of the natal holt/holts. This could affect breeding success in the season that the disturbance occurs but would not be expected to affect breeding success in the longer-term. Installing culverts within wet and dry ditches and within watercourses would temporarily affect commuting / foraging activity along these features which may cause a medium negative effect whilst works take place (medium-term), but otter would use these culverts once they are installed so the effect would be reversable. Habitat loss and fragmentation – fencing on site and open cut trenches have the potential to create barriers to otter movement when travelling across their range. This would have a medium negative effect on the local otter population in the medium-term which would be reversible once the construction works end and habitat is reinstated. Impacts are anticipated at O1, O2, O9, O10 and O11 (Figure A8.13.2: Otter Field Survey Results in Appendix 8.13: Otter and Water Vole Report (document reference 6.8.A13). It is likely that the otter resting sites (O10 and O11) will effectively be removed to facilitate construction. A further 72 watercourses are to be surveyed in 2025 (not included within this ES (Volume 6 of the DCO application)) but will be provided as further environmental information. To ensure a full assessment can be completed it is reasonable to assume that one additional resting site may need to be removed to facilitate construction based on the reasonable worst case scenario baseline findings. Mortality – collision risk, although otter is not a nocturnal species in East Anglia, it is more likely to be active when there are fewer people around typically at dawn and dusk. Most of the construction works would take place during daylight hours and so the risk of collision is		

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			low. Otter tends to follow ditches and watercourses in this landscape further reducing the likelihood that it would meet construction vehicles. Due to the low risk of mortality there is the potential for a small negative effect that would not impact the local population in the medium-term (duration of the Project construction phase). The above effects would be considered significant.		
Water Vole	Medium/County	As identified previously the Project has sought to avoid direct effects on watercourses wherever practicable through embedded mitigation. Nevertheless, the haul roads and underground cables would cross watercourses at 31 locations where signs of water vole were confirmed, or potential signs of water vole were recorded. Drainage outfall pipes from sustainable drainage features would temporarily be installed in two watercourses where signs of water vole were confirmed, or potential signs of water vole were recorded. These works would lead to the temporary removal of bankside habitat that is suitable to support both water vole burrows and may be used by foraging water vole. There would be no permanent loss of habitat suitable for use by water vole.	Habitat loss/modification – resulting in the direct loss of habitat that supports water vole and disturbance to water vole. The loss of 12 - 50 m sections of bank side habitat beneath the footprint of the haul roads / underground cable crossings have the potential to have a medium negative effect on the foraging habitat available to water vole as a breeding female typically holds a territory of 30 m to 150 m. These works would take place at 28 locations with confirmed or potential presence of water vole. These 28 locations are at: • Watercourse ID 182 (Section A) • Watercourse ID 201 (Section A) • Watercourse ID 1 (Section A) • Watercourse ID 9 (Section A) • Watercourse ID 10 (Section A) • Watercourse ID 16 (Section A) • Watercourse ID 126 (Section A) • Watercourse ID 125 (Section A and B) • Watercourse ID 25 (Section B) • Watercourse ID 30 (Section B) • Watercourse ID 31 (Section B) • Watercourse ID 32 (Section B) • Watercourse ID 37 (Section B) • Watercourse ID 128a and 128b (Section B) • Watercourse ID 133 (Section B) • Watercourse ID 134 (Section B) • Watercourse ID 135 (Section B) • Watercourse ID 41b (Section C) • Watercourse ID 52 (Section D) • Watercourse ID 54 (Section D)	Water vole is a highly mobile species with populations rising and falling in response to time of year with more water voles present during the breeding season, habitat conditions such as water levels and shading, and in response to predation from American mink. As set out in Section 6 of the Outline LEMP (document reference 7.4), pre-construction surveys would be undertaken to ensure that the presence of water vole is recorded and where practicable haul roads and works affecting watercourse banks would be micro-sited to avoid effects to water vole burrows. Where avoidance is not practicable then water vole would be displaced into adjacent habitats, at appropriate times of year under licence, to avoid direct effects to occupied burrows. On completion of the works the banks of the impacted watercourses would be restored and water vole would be able to recolonise the habitat from the adjacent areas into which they were displaced.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on water vole.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			• Watercourse ID 60 (Section D) • Watercourse ID 62 (Section E) • Watercourse ID 71 (Section E) • Watercourse ID 72 (Section E/F) • Watercourse ID 73 (Section F) • Watercourse ID 79 (Section F) • Watercourse ID 95 (Section G) • Watercourse ID 100 (Section G) • As a precautionary reasonable worst case scenario it assumed that there will be direct impacts on 72 additional watercourses where water vole presence has been assumed. Works would be reversible in the medium-term once vegetation re-establishes. Given the limited extent of vegetation clearance, it is anticipated that the water vole population would quickly recover and there would be no significant long-term effect on the water vole population of county importance and of medium value. Mitigation is required for legal compliance. The installation of three additional drainage outfalls at watercourse ID 41a (Section C), watercourse ID 42 (Section C), and watercourse ID 150 (Section C) are proposed for watercourses where there is potential for water vole to be present. This would lead to the temporary loss of approximately 5 m from one length of bankside habitat suitable for water vole. Whilst the footprint would be smaller than required for the haul road, these works have to potential to have a small negative effect on water voles in the medium term which would be reversable post-construction when habitat would naturally regenerate. The above effects would be considered significant.		
Badger	Negligible/Site	Badger setts have been recorded within the Order Limits; however, it would be possible to avoid direct effects to, and undertaking works likely to cause disturbance to, most of the potential and confirmed main badger setts that are within the Order Limits. The	Habitat loss/modification – resulting in the loss or damage to setts and potentially the killing/injuring of badgers. Habitat loss/modification - would have a temporary effect on the availability of foraging habitat for badger, the areas lost to permanent infrastructure would not have a significant	The Project has been designed to avoid direct and indirect effects to most main badger setts within the Order Limits. Within the Order Limits, there are five main setts where it would not be practicable to avoid direct effects and works close to these setts would be undertaken under licence that would enable partial closure of these	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on badgers.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		Project would directly and indirectly affect smaller setts such as outlier badger setts, either through the removal of vegetation above the setts that would cause disturbance to badger or through the removal of setts. Ground-breaking works would take place within 30 m of five main setts (locations are presented within a confidential appendix). For most of its length the haul roads would not be used at night, when badgers are active, and it would not represent a barrier to the movement of badgers. Where works would progress through the night, vehicle movements would be subject to speed limits that would reduce mortality to badgers. Open cut trenching works would create a barrier to the movement of badgers across their territory.	effect on the foraging resources available to badgers. Habitat fragmentation affecting commuting routes and foraging corridors. Whilst badger is not a species of biodiversity concern and so effects to badgers would not be significant in these terms, badgers are legally protected and so mitigation measures would be adopted to avoid harm and negative effects on this species.	setts so that works could proceed without causing harm to badger. As identified in the Outline CoCP (document reference 7.2), pre-construction walkover surveys would be undertaken to confirm protected species constraints. As identified in Section 6 of the Outline LEMP (document reference 7.4), this would include a search for active badger setts. The survey would identify setts that would require closure under licence and/or setts that would require monitoring. Sett closures and monitoring would take place in accordance with a licence. As set out in Section 6 of the Outline LEMP (document reference 7.4), where signs of badger activity are recorded, to avoid harm to badger when foraging and commuting, mitigation measures would be put in place to either prevent animals from becoming trapped in excavations and trenches or a means of escape provided. Fencing that would be installed to delineate working areas on site would be permeable to badgers to ensure continued access to foraging habitat in the wider landscape. The removal of habitat within working areas that is used by foraging badger would be temporary. Habitats would be reinstated in line with the habitat reinstatement principles within Section 9 of the Outline LEMP (document reference 7.4).	
Species of Principal Importance – common toad, brown hare, harvest mouse, hedgehog and polecat.	Low/Local	Whilst there are waterbodies including ponds, water supply reservoirs and reservoirs used for agricultural purposes within and adjacent to the Order Limits there would be no direct effects to these waterbodies. Therefore, habitat suitable for breeding common toad would not be affected by the Project. Habitat suitable for common toad in its terrestrial phase would also be suitable for brown hare, harvest mouse,	Habitat loss – there would be a temporary loss of habitat suitable to support these species across the Order Limits. In the absence of mitigation, the extent of temporary habitat loss associated with this Project would not be expected to have a significant effect with impacts considered to be of negligible magnitude on these species at a population level. Individuals would be displaced but given the extent of other suitable habitat close to the Order Limits and the limited footprint of most of the works within the Order Limits no significant effects would arise because of habitat loss.	As identified in the Outline CoCP (document reference 7.2), under B01 pre-construction walkover surveys would be undertaken to confirm protected species constraints. This would identify where there is the potential for protected species to be present and where mitigation measures would need to be implemented to avoid mortality to species. Under B03 speed limits would be enforced to ensure collision risk to fauna minimised. As set out in Section 6 of the Outline LEMP (document reference 7.4), pre-construction checks would be undertaken	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on common toad, brown hare, harvest mouse, hedgehog and polecat.

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		hedgehog and polecat. These species could be present in suitable habitat across the Order Limits. These species are habitat generalists and found in cropped farmland, grassland fields, woodland, wetland, hedgerows and in tall vegetation on the edge of these habitats.	Habitat fragmentation – these species would reside in hedgerows, field margins, the banks of watercourses and ditches with the larger more mobile species such as common toad, hedgehog and polecat using these to travel across their range. Fragmentation of these features would both affect habitat that supports these species and habitat that allows them to travel across the landscape. In the absence of mitigation, habitat fragmentation would not have a significant effect with effects considered to be of negligible magnitude on these species at a population level. These species would be able to cross the Order Limits via the belts of retained vegetation associated with the hedgerow, ditch and watercourse network. Habitat disturbance – these species are likely to be present in habitat that is retained adjacent to the working areas and therefore there is the potential for disturbance to individuals and these species when they are breeding. There would be a small negative effect that would be reversable in the medium term with species likely to be displaced into adjacent suitable habitat for the duration of the works. Hydrological – if polluted runoff laden with silt or other pollutants were to enter waterbodies that support breeding common toad this would negatively affect the common toad population. If polluted water were to enter wetland habitats this could affect all five of these SPI species as they would all forage within these habitats. There would be a medium negative effect which would be reversable in the medium-term post construction. Mortality – there is the potential that individuals would be killed during vegetation clearance. Dependent on the time of year this could also affect the animals when they are breeding and so affect the future survival of these species at the site level. Several of these species are more active at night and so there is the potential for collision with site traffic, the risk of encountering traffic at night is reduced as most works would be restricted to daylight hours with more limited works taking place on a 24-hour basis. In the absence of mitigation, mortality to individuals during vegetation clearance could	by the ECoW to ensure no harm to these species during vegetation clearance and that mitigation measures would be in place to safeguard populations.	

Receptor (and Project Section)	Value / Importance	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			have a medium negative effect on these species at the population level. Lighting – it is not anticipated that lighting during construction would negatively affect these species which would have a negligible effect and be non-significant.		
Great Crested Newt	N/A	As identified in the IACPC, 18 ponds would be functionally lost because of the Project.	The functional loss of ponds would affect the great crested newt population.	As identified in the IACPC, 44 ponds would be provided by the DLL to mitigate for the functional loss of ponds.	Following the application of mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on great crested newt.

Operation (and Maintenance)

8.7.6 This section identifies the anticipated effects of the Project following the implementation of embedded, standard and additional mitigation measures for operation (and maintenance).

8.7.7 To ensure that the appropriate level of mitigation has been applied, the potential pathways to effect during operation (and maintenance) have been set out for each biodiversity receptor in Table 8.24.

8.7.8 The following impact pathways have been identified during the operation (and maintenance) phase which, along with the ZoI, have been set out below.

- Disturbance of fauna that are protected species/species of conservation concern from noise, vibration or visual stimuli during operation (and maintenance), up to 500 m dependent on species
- Habitat fragmentation or severance during operation (and maintenance), up to 500 m dependent on species
- Killing or injury of protected species/species of conservation concern, within the Order Limits.

8.7.9 Due to the low predicted number of vehicle movements in operation (an maintenance), it was agreed through the EIA Scoping Opinion (document refence 6.20) that vehicle emissions during operation (and maintenance) are unlikely to result in significant effects on biodiversity receptors; this matter has been scoped out of the ES (Volume 6 of the DCO application).

Table 8.24 Impact assessment including residual effects on ecology and biodiversity receptors during operation (and maintenance)

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
International (Statutory) Sites Designated for Biodiversity					
Stour and Orwell Estuaries Ramsar Site, SPA and SSSI (Section C)	Very High/ International	As identified previously the Project would not directly affect the designated site, which at its closest point is 4 km from the Project. The underground cable would be located within farmland that has been identified as FLL. No permanent above ground infrastructure is to be installed in the FLL, and the land above the underground cable would be returned to agricultural use.	Disturbance – if maintenance works take place in the winter months, then there is the potential for disturbance to birds using the FLL. In the absence of mitigation, birds would likely move temporarily to areas of suitable habitat in the wider area which would be a negligible effect in the short term on qualifying features.	Not required.	None.
Thames Estuary and Marshes Ramsar Site and SPA (Section H)	Very High/ International	At its closest point the Project would be located 2 km to the west of this SSSI. The Project is not located in FLL and the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access routes and would not affect designated habitat or species.	There would be no direct or indirect effects on the designated habitats or features associated with the site, with the Project located 2 km to the west. No pathways to effect that have the potential to give rise to significant effects have been identified.	Not required.	None.
National (Statutory) Sites Designated for Biodiversity					
Cattawade Marshes SSSI (component of the Stour and Orwell Estuaries Ramsar Site and SPA) (Section C)	High/National	At its closest point the Project would be located 3.16 km from the SSSI. Although the Project is located in FLL, the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access routes and would not affect designated habitat or species.	None.	Not required.	None.
Stour Estuary SSSI (component of the Stour and Orwell Estuaries Ramsar Site and SPA) (Section C)	High/National	At its closest point the Project would be located 3.64 km from the SSSI. Although the Project is located in FLL, the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access routes and would not affect designated habitat or species.	None.	Not required.	None.
Orwell Estuary SSSI (component of the Stour and Orwell Estuaries Ramsar Site and SPA) (Section C)	High/National	At its closest point the Project would be located 4.36 km from the SSSI. Although the Project is located in FLL, the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access	None.	Not required.	None.

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
		routes and would not affect designated habitat or species.			
Mucking Flats and Marshes SSSI (Section H)	High/National	At its closest point the Project would be located 2 km to the west of this SSSI. The Project is not located in FLL and the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access routes and would not affect designated habitat or species.	None.	Not required.	None.
South Thames Estuary and Marshes SSSI (Section H)	High/National	At its closest point the Project would be located 3.64 km to the north of this SSSI, separated from the Project by the River Thames. The Project is not located in FLL and the baseline surveys have not identified significant numbers of birds flying at collision risk height. Works required for the operation (and maintenance) of the Project would be limited to the footprint of the Project and its permanent access routes and would not affect designated habitat or species.	None.	Not required.	None.
Habitat					
All habitat	Low-High	There would be the need to maintain the Project which would require the management of existing habitat or habitat that has established post construction. This may be trees or vegetation underneath the overhead lines or at the base of pylons.	Given the temporary nature of habitat management to facilitate works, in the absence of mitigation there is the potential for a small negative effect that would be reversable in the short to medium term through improper working practices. The effects would be significant.	Standard operating procedures would be followed when undertaking vegetation removal. Habitat would be assessed on a case-by-case basis by an ecologist to determine the level of mitigation required.	Following the application of the standard mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on habitat.
GWDTE Four SSSIs, five LNRs, 26 CWSs and 26 LWSs within 2 km are hydrologically linked to the Project[12]	Medium /County	No works during the operation (and maintenance) phase would be associated directly or indirectly with these sites.	None.	Not required.	None.

[12] The four SSSIs comprise: Aslacton Parish Land SSSI (Section A), Forncett Meadows SSSI (Section A), Flordon Common SSSI (Section A), Shelfanger Meadows SSSI (Section A)

The five LNRs comprise: Roydon Fen LNR and CWS (Section A), Bramford Meadows LNR and CWS (Section B), Needham Lake LNR (Section B), Brockwell Meadows LNR (Section E) and Chelmer Valley Riverside LNR (Section F)

The 26 CWSs comprise: Bressingham Fen CWS (Section A), Brick Kiln Lane, Bunwell Hill CWS (Section A), Brock's Watering CWS (Section A), Bunwell Fen CWS (Section A), Carlton Rode Fen CWS (Section A), Dunston Common CWS (Section A), Flordon Meadow (East) CWS (Section A), Flordon Meadow (West) CWS (Section A), Hapton Common CWS (Section A), Horseford Meadow CWS (Section A), Muir Lane Meadow CWS (Section A), Tas Pond CWS (Section A), Tas Valley CWS (Section A), The Carr CWS (Section A), The Grange, Wreningham CWS (Section A), Wreningham Marsh CWS (Section A), Horse Fen CWS (Section A), Hall Farm Meadow CWS (Section B), River Gipping (Sections) CWS (Section B), River Waveney (Sections) CWS (Section B), Thrandeston Marsh CWS (Section B), Topcroft Farm Meadows CWS (Section B), Higham Meadow CWS (Section C), River Brett (Sections) CWS (Section C), Springhill Meadows CWS (Section C) and Wasses Marshes CWS (Section C)

The 26 LWSs: comprise Ardleigh Reservoir Grassland Local Wildlife Site (LWS) (Section C), Black Brook LWS (Section C), Bridges Farm LWS (Section C), Langham Water Works LWS (Section C), The Coombs LWS (Section C), Wall's Wood LWS (Section C), Fordham Bridge Meadow LWS (Section D), Marks Tey Brick Pit LWS (Section D), West Bergholt Alderwoods LWS (Section D), Blackwater Plantation LWS (Section E), Buckler's Farm Wood LWS (Section E), Coggeshall Hall Farm LWS

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
Invasive Non-Native Species (INNS) - Plants					
INNS	Not applicable.	There would be the need to maintain the Project which would require the management of existing habitat or habitat that has established post construction. This may support INNS.	Given the temporary nature of habitat management to facilitate works, in the absence of mitigation there is the potential for a medium negative effect that would be irreversible in the short to medium term through improper working practices that may cause the spread of INNS. The effects would be significant.	Standard operating procedures would be followed when undertaking vegetation removal ensuring proper biosecurity on site to limit the spread of INNS. Habitat would be assessed on a case-by-case basis by an ecologist to determine the level of mitigation required.	Following the application of the standard mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on the aquatic or terrestrial environment from invasive non-native plants.
Protected Species / Species of Conservation Concern (Fauna)					
Birds (Wintering/ Passage Birds)	Low/Local to Medium/ County	The overhead lines have the potential to fragment movement corridors that are used by birds when moving between foraging habitat on the estuaries and coast and roosting and foraging habitat inland. The precautionary mitigation measures that have been incorporated into the design are orange spacers and bird diverters applied to the earth wire at the River Waveney between pylons RG87 and RG88 and Ardleigh Reservoir between pylons TB15 and TB16.	Mortality – The only effect that the Project would have on birds is collision risk. The survey data has not highlighted any areas of particular concern with regard to collision that would have an impact of local level or above. In addition, no qualifying bird species of the Stour and Orwell Estuaries SPA and Ramsar Site were recorded in flight at Ardleigh Reservoir. Cormorant is a species which makes up part of a waterbird assemblage on the SPA designation and was recorded in flight; the times were insignificant and as such collision risk impact has been screened out of HRA for this site. Natural England agrees with this conclusion. Collision risk and potential mortality in the absence of mitigation is considered to be a negligible effect in the medium term which is not significant. **Future Baseline along the River Waveney:** The current condition of the habitats at the Waveney crossing are sub-optimal for waterbirds. The river course is narrow, scrub/tree lined with woodland in the vicinity and intensely grazed sheep fields or arable land in the vicinity. The WaLOR project is proposed for this area in which a restoration and enhancement program for the river catchment areas would be delivered. In the future the habitats are likely to become more suitable for waterbirds and Mitigation	Not required.	None.

(Section E), Feering Marsh LWS (Section E), Hoo Hall Meadows LWS (Section E), Tilkey Road Coggeshall LWS (Section E), Witham Marsh LWS (Section E), Border Wood Lake LWS (Section F), Broomfield – Little Waltham Chelmer LWS (Section F), Langleys Deer Park LWS (Section F), Little Waltham Village Meadows LWS (Section F), Lowley's Farm LWS (Section F), Writtle Bridge Meadow LWS (Section F), Hutton Country Park LWS and LNR (Section G), Little Burstead Wood LWS (Section G), Stock Brook Meadow LWS (Section G) and The Wilderness LWS (Section G)

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			measures have been incorporated into the design on a precautionary basis. **Ardleigh Reservoir:** Despite the conclusions above, the highest number of target bird species (those thought to be of particular risk of collision) was recorded at Ardleigh Reservoir. In addition, numerous desk study records exist for Ardleigh Reservoir and the large waterbody provides habitat for a range of waterbirds. Mitigation measures have been incorporated into the design on a precautionary basis. No other pathways to effect have been identified and no significant effects on wintering and passage birds are predicted because of operation (and maintenance) of the Project.		
Bats (Foraging and Commuting)	Medium/County and Regional to High/National	It is not possible to plant trees within the overhead line clearances or over the underground cables. It would be practicable to plant shrubs in these areas and all hedgerows and woodlands affected by the Project would be reinstated on completion of the construction works. Most of the operation (and maintenance) activities would take place during daylight hours. Operational facilities would only be illuminated for emergency works. New external lighting would be required at Bramford Substation, the new EACN Substation and the new Tilbury North Substation. External operational lighting would not be required at the CSE compounds at Dedham Vale, Horkesley East, Horkesley West, Fairstead, Tilbury 1 and Tilbury 2.	Habitat fragmentation – the replacement planting would ensure that bat foraging and commuting routes would not be fragmented once the Project is operational. Maintenance works would require trees to be cut back, but the presence of the overhead line and underground cable would not restrict the growth of hedgerows such that they would not be suitable for commuting and foraging bats. Any lighting that would be required to carry out operation (and maintenance) activities would be of relatively short duration so the risk that this would affect foraging routes and commuting corridors is low. The lighting at the substations would have a negative effect on bat foraging and commuting routes if present in the locality. There are wooded corridors and hedgerows in proximity to Bramford Substation, the new EACN Substation and the new Tilbury North Substation. Only pipistrelle bats were recorded in high numbers around the location of the proposed EACN Substation but these are not considered to be a light sensitive species. Lighting in the other locations has the potential to affect light sensitive bat species. The most sensitive location is near Bramford Substation where barbastelle bats and serotine were recorded. In the absence of mitigation permanent lighting associated with the substations and	Standard operating procedures would be followed to ensure bat friendly lighting is designed and implemented in line with guidance from the Institute of Lighting Professionals and BCT (BCT, 2023). These mitigation measures would be used where lighting is in proximity to the retained wooded corridors and hedgerows to ensure that dark corridors suitable for bats are retained at Bramford Substation, the new EACN Substation and the new Tilbury North Substation. If this is not practicable, additional screening may be required at detailed design.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on foraging and commuting bats.

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			temporary lighting associated with operation (and maintenance) activities would have as small negative effect on foraging and commuting bats that would be irreversible in the long-term. The effect would be significant.		
Bats (Roosting)	Medium/County and Regional to High/National	Tree works would be required to maintain clearance zones beneath the overhead line, to provide access to underground cables and to provide access to the new substations and CSE compounds.	Disturbance and loss of roost features – tree works would directly or indirectly lead to the temporary or permanent loss of features used by individual bats and/or features used by several bats such as a maternity or hibernation roost. In the absence of mitigation disturbance to and the loss of features used by roosting bats would have a small negative effect on the bats using these features which could be of local to national importance as roosts of low to high value dependent on the nature of the roost and the species present. The effect would be significant.	Standard operating procedures would be followed to ensure that where trees are to be removed their suitability to support bats is assessed with appropriate mitigation measures put in place for legal compliance. Such mitigation measures include, but are not restricted to, field surveys to assess the trees, confirm the presence/absence of bats, and for works to proceed under licence if necessary.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on roosting bats.
Species of Principal Importance – invertebrates, fish, common toad, reptiles, hazel dormouse, water vole, otter, brown hare, harvest mouse, hedgehog and polecat. Plus legally protected nesting birds and badger.	Low/Local	Vegetation management would be required to facilitate access to the infrastructure during operation (and maintenance). It would also be required to maintain the clearances required under the overhead line.	Disturbance and loss of sites used for resting, nesting and where applicable hibernation – vegetation management has the potential to occur at any time of year particularly when associated with emergency works. Vegetation management has the potential to impact most of these species at all life stages. In the absence of mitigation this has the potential to negatively affect these populations of local importance and low value. This habitat loss would be localised. Dependent on the time of year and life stage that the animals are in when they are disturbed, they may be displaced into areas of retained habitat or more negatively affected. It is anticipated that the affected areas would be recolonised from populations in adjacent retained habitats once the vegetation recovers. The impact would therefore last for the time that it takes for vegetation to recover.	Standard operating procedures would be followed to ensure that where vegetation is to be removed its suitability to support Species of Principal Importance is assessed via a desk study. An ecological walkover survey would be undertaken where potential ecological effects were identified to ensure legal and policy compliance. The need for mitigation measures and works to proceed under ecological supervision or a licence in accordance with site specific method statements would be informed by the result of the desk study and walkover survey.	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual effect** on Species of Principal Importance including invertebrates, fish, common toad, reptiles, hazel dormouse, water vole, otter, brown hare, harvest mouse, hedgehog and polecat. Plus legally protected nesting birds and badger.
Great Crested Newt	-	Ground breaking works within 250 m of a waterbody suitable for use by breeding great crested newt would need to be reviewed for their potential to affect great crested newt.	Disturbance and loss of sites used for resting, nesting and where applicable hibernation – vegetation management has the potential to occur at any time of year particularly when associated with emergency works. Vegetation management has the potential to impact great crested newt at all life stages.	Standard operating procedures would be followed to ensure that where vegetation is to be removed its suitability to support great crested newt is assessed via a desk study. An ecological walkover survey would be undertaken where potential ecological effects were	Following the application of the outlined mitigation, it is concluded that there would be an overall **negligible** magnitude of impact with **no significant residual**

Receptor (Project Section)	Value	Description of Works	Pathway to Effect and Significance of Effect	Mitigation Applied	Residual Effect
			In the absence of mitigation this has the potential to negatively affect populations of local importance and low value. This habitat loss would be localised. Dependent on the time of year and life stage that the animals are in when they are disturbed, they may be displaced into areas of retained habitat or more negatively affected. It is anticipated that the affected areas would be recolonised from populations in adjacent retained habitats once the vegetation recovers. The impact would therefore last for the time that it takes for vegetation to recover.	identified to ensure legal and policy compliance. The need for mitigation measures and works to proceed under ecological supervision and/or a licence in accordance with site specific method statements would be informed by the result of the desk study and walkover survey.	**effect** on great crested newt.

8.8 Monitoring

8.8.1 No significant residual effects have been identified that would need to be monitored.

8.9 Sensitivity Testing

8.9.1 Sensitivity testing has been undertaken as described in Chapter 5: EIA Approach and Method (document reference 6.5) to determine if delays or an extension to the construction programme, changes to the design within the LoD or if any of the design scenarios presented in Table 4.4 in Chapter 4: Project Description (document reference 6.4) would affect the assessment.

Flexibility in Construction Programme

8.9.2 The assessment is based on a four-year vegetation clearance and construction programme, as identified within Chapter 4: Project Description (document reference 6.4) that would commence in 2027.

8.9.3 If the construction works were delayed or extended this would not affect the assessment of effects on ecology and biodiversity receptors or introduce any new significant effects. The commitments in the Outline CoCP (document reference 7.2) and Outline LEMP (document reference 7.4) ensure adherence to the mitigation hierarchy and identify the measures required to ensure no significant residual effects on ecology and biodiversity receptors would arise because of the Project.

Flexibility in Design

Flexibility within the Limits of Deviation

8.9.4 The assessment presented within Section 8.7 has been undertaken on the design shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1) and Figure 4.2: Proposed Project Design – Permanent Features (document reference 6.4.F2). It should be noted that as described in Chapter 4: Project Description (document reference 6.4), the Project's design is not fixed and could be subject to change within the defined LoD within the parameters shown on the Works Plans (document reference 2.3) unless commitments have been made otherwise.

8.9.5 The assessment assumes that there is some flexibility in design where elements of the Project may be installed within the LoD allowed for within the Order Limits taking account of the Project commitments set out in the Outline CoCP (document reference 7.2). These commitments include a 15 m buffer between the Project and ancient woodland. Where works are required to existing infrastructure that is already located within ancient woodland, this buffer cannot be maintained. However, the removal of infrastructure is expected to be of benefit to the woodland habitat in the longer-term.

8.9.6 The application of the LoD for various elements would enable micro-siting that would reduce effects to ecology and biodiversity receptors, for example the loss of individual mature trees for the drainage channels that would discharge into the Black Brook LWS and cross Higham Meadow CWS, and the loss of features that support protected species such as water vole burrows, badger setts and trees with bat roosts.

8.9.7 Adherence to the commitments in the Outline CoCP (document reference 7.2) and Outline LEMP (document reference 7.4) would ensure that the application of the LoD would not alter the assessment of effects on ecology and biodiversity receptors, and ensure no significant residual effects on ecology and biodiversity receptors would arise because of the Project.

Flexibility within the Order Limits

8.9.8 There are 19 locations where design scenarios have been identified within Chapter 4: Project Description (document reference 6.4). The effects of the design scenarios on ecology and biodiversity receptors in comparison with the Project have been assessed below. Those that would result in different effects from those reported in this chapter are noted.

Norwich Main Substation (Section A)

8.9.9 The Norwich Main Substation design scenario would have similar effects to the Project alignment assessed in Section 8.7. The main difference would be that a belt of woodland that is the HPI lowland mixed deciduous woodland would be affected instead of the belt of other woodland. Whilst the HPI woodland is intrinsically more valuable to biodiversity than the other woodland, this temporary loss of woodland habitat would not significantly alter the findings of the assessment and replacement habitat would be provided. Overall, the design scenario would **not result in any different or additional significant effects.**

River Stour Crossing west of Stratford St Mary (Section C)

8.9.10 The River Stour crossing design scenario provides for a single underground crossing at either the western or eastern crossings rather than two crossings of the River Stour. If 999either single crossing were taken forwards following detailed ground investigations it would affect the same habitats and species as the assessed Project but there would be a reduction in the amount of habitat that would be temporarily removed and reinstated. This would not significantly alter the mitigation measures identified in this location or the findings of the impact assessment. Therefore the design scenario would **not result in any different or additional significant effects.**

The Walthams and Standard Heights to the south of the River Chelmer (Section F)

8.9.11 The assessment of effects in this chapter is based on a design that uses low height pylons between TB140 to TB142. In the Walthams and standard heights scenario the design would use standard lattice pylons between TB140 to TB143 and one pylon would be removed. The design would remain the same in all other respects. The only ecological receptor that could be affected by this design change is birds that may be at risk of collision. Wintering bird surveys were undertaken close to TB140 to assess the risk of collision for target bird species that may be using the River Chelmer as a wildlife corridor. The survey revealed no collision risk. This design scenario would **not result in any different or additional significant effects.**

Southfields Development south of the A1013 (Section H)

8.9.12 The Southfields Development design scenario would affect the alignment of the overhead line between TB255 and TB259. The design scenario would result in these pylons being realigned/relocated within arable farmland (cropland) avoiding effects to Buckingham Hill LWS and an adjacent revegetated sand quarry that supports a

moderately diverse flora. This design scenario would avoid effects to a biodiversity receptor of county importance and medium value (Buckingham Hill LWS) and avoid the need for mitigation planting for this habitat loss. Overall, this design scenario would not alter the impact assessment. However, the design scenario would **not result in any different or additional significant effects.**

Thurrock Airfield and Low Heights west of Langdon Hills Golf and Country Club (Section H)

8.9.13 The Thurrock Airfield design scenario would adopt standard lattice pylons between TB238 and TB243 rather than low height pylons. This would not affect the residual effects reported in this chapter as vegetation loss would be slightly smaller for the footprint of the standard lattice pylons (when compared to the low height pylons) and no potential wildlife corridors suitable for large flocks of bird species which are at risk of collision have been identified in this area. Therefore, this design scenario would **not result in any different or additional significant effects.**

South of the proposed new Tilbury North Substation (Section H)

8.9.14 The south of the proposed new Tilbury North Substation design scenario allows for a wider LoD should the Project need to respond to third party developments. The Order Limits are not altered by the design scenario. No new ecological receptors would be affected by this design scenario. The design scenario would **not result in any different or additional significant effects.**

Other Design Scenarios

8.9.15 The remaining design scenarios identified within Table 4.4 of Chapter 4: Project Description (document reference 6.4) would affect the same habitats and species as the Project and would **not result in any different or additional significant effects.**

Abbreviations

Abbreviation	Full Reference
ArbCoW	Arboricultural Clerk of Works
ALBST	Advanced Licence Bat Survey Techniques
AONB	Area of Outstanding Natural Beauty
BCT	Bat Conservation Trust
BNG	Biodiversity Net Gain
BS	British Standard
CEZ	Construction Exclusion Zones
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information
CoCP	Code of Construction Practice
CSE	Cable Sealing End (compound)
CWS	County Wildlife Site
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department of Energy Security and Net Zero
DLL	District Level Licensing
EACN	East Anglia Connection Node
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
eDNA	Environmental deoxyribonucleic acid
EIA	Environmental Impact Assessment
ES	Environmental Statement
FAR	Further Assessment Required
FLL	Functionally Linked Land
GLTA	Ground Level Tree Assessment
GWDTE	Groundwater Dependent Terrestrial Ecosystems
ha	Hectares
HGBI	Herpetofauna Groups of Britain and Ireland

Abbreviation	Full Reference
HPI	Habitat of Principal Importance
HRA	Habitats Regulations Assessment
IACPC	Impact Assessment and Conservation Payment Certificate
IEF	Important Ecological Feature
IEMA	Institute for Environmental Management and Assessment
IHP	Invertebrate Habitat Potential
INNS	Invasive Non-Native Species
ISA	Invertebrate Survey Area
IUCN	International Union for Conservation of Nature
IRZ	Impact Risk Zones
JNCC	Joint Nature Conservation Committee
KRS	Key Reptile Sites
kV	Kilovolt
LEMP	Landscape and Ecological Management Plan
LLFA	Lead Local Flood Authorities
LoD	Limits of Deviation
LONI	Letter of No Impediment
LNR	Local Nature Reserve
LNRS	Local Nature Recovery Strategy
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for the Countryside
NERC	Natural Environment and Rural Communities Act 2006
NNR	National Nature Reserve
NSN	National Site Network
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
PPE	Personal Protective Equipment
PRF	Potential Roost Features
PRF-M	Potential Roost Feature – Multiple
RNR	Roadside Nature Reserve

Abbreviation	Full Reference
RPA	Root Protection Area
SAC	Special Area of Conservation
SFCC	Scottish Fisheries Co-ordination Centre
SoCG	Statement of Common Ground
SPA	Special Protection Area
SPI	Species of Principal Importance
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage
PEIR	Preliminary Environmental Information Report
UKPN	UK Power Networks
VP	Vantage Point
WaLOR	Waveney and Little Ouse Recovery
WCA	Wildlife and Countryside Act 1981
WFD	Water Framework Directive

Glossary

Term	Description
Ancient woodland	Land that has been continually wooded since at least 1600 in England. Regarded as '*irreplaceable habitat*' in national planning policy and guidance. Ancient woodland greater than 2 ha is recorded on the Natural England Ancient Woodland Inventory.
Ancient Woodland Inventory	A dataset managed by Natural England to identify and record information about ancient woodland sites in England.
Biodiversity	The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.
Cable	An insulated conductor designed for underground installation.
Cable Sealing End	Structures used to transfer transmission circuits between underground cables and overhead lines.
Cable Sealing End compound	Electrical infrastructure used as the transition point between overhead lines and underground cables. A compound on the ground acts as the principal transition point.
Cable Sealing End Platform	Electrical infrastructure used as the transition point between overhead lines and underground cables. A platform on the pylon acts as the principal transition point.
County Wildlife Site	Non-designated areas of land important for their wildlife and nature conservation value.
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
Fauna	All the animals in a given area.
Flora	The plants within a particular habitat or region.
Groundwater	Water that is in the ground. This is usually referring to water in the saturated zone below the water table.
Groundwater Dependent Terrestrial Ecosystems	Wetlands which critically rely on groundwater flows and/or chemistries.
Habitat	The natural home or environment of an animal, plant, or other organism.
Habitat of Principal Importance	A habitat which has been deemed to be of principal importance for the purpose of conserving biodiversity, currently adopted under s41 of the Natural Environment and Rural Communities Act 2006, formerly listed in the UK Biodiversity Action Plan.

Term	Description
Habitats Regulations Assessment	The process by which plans and projects are assessed as to whether they are likely to have a significant effect on a European site either alone or in combination with other plans or projects, under the Conservation of Habitats and Species Regulations 2017, as amended in 2019.
Haul Road	Another term used for the temporary access route, which is a temporary route built to carry construction vehicles within the Order Limits.
Horizontal directional drilling	Trenchless method for the installation of pipes, in a shallow arc using a surface-launched drilling rig. It applies to large-scale crossings in which a fluid filled pilot bore is drilled without rotating the drill string, and this is then enlarged by a washover pipe and back reamer to the size required for the product pipe.
Invasive Non-Native Species (INNS)	An Invasive Non-Native Species is any non-native animal or plant that can spread, causing damage to the environment, the economy, health, and way of life.
Local Nature Reserve	Sites dedicated by the Local Planning Authority under Section 21 of the National Parks and Access to the Countryside Act 1949 for nature conservation which have wildlife or geological features that are of special interest locally.
Local Planning Authority	The public authority whose duty it is to carry out specific planning functions for a particular area.
Local Wildlife Site	Non-designated areas of land important for their wildlife and nature conservation value.
Mitigation	The action of reducing the severity and magnitude of change (impact) to the environment. Measures to avoid, reduce, remedy or compensate for significant adverse effects.
Notable species	Species of conservation concern as listed under s41 of the Natural Environment and Rural Communities Act 2006.
Notable bird species	Birds listed under s41 of the Natural Environment and Rural Communities Act 2006, under Schedule 1 of the Wildlife and Countryside Act 1981, as amended and those listed as red or amber in the Birds of Conservation Concern 5 (Stanbury *et al*., 2021).
National Vegetation Classification	A system of classifying natural habitat types in Great Britain according to their vegetation types.
Order Limits	The maximum extent of land within which the authorised development may take place.
Overhead line	Conductor (wire) carrying electric current, strung from pylon to pylon.
Priority species	Species identified as of principal importance in England, in accordance with requirements of the Natural Environment and Rural Communities

Term	Description
	Act 2006. These are based on the UK Biodiversity Action Plan Priority Species.
Schedule 1 species	Birds listed under Schedule 1 of the Wildlife and Countryside Act 1981, as amended.
Site of Special Scientific Interest (SSSI)	SSSIs are protected by law under the Wildlife and Countryside Act 1981. They are important because they support rare or endangered fauna and flora, and they represent the United Kingdom's best wildlife and geological sites.
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
Substation	Substations are used to control the flow of power through the electricity system. They are also used to change (or transform) the voltage from a higher to lower voltage to allow it to be transmitted to local homes and businesses.
Trenchless crossing	A crossing installation method that has limited above ground disturbance which is used to avoid a sensitive feature such as an environmental feature.
UK Power Networks (UKPN)	UK Power Networks (Operations) Limited (registered company number 03870728) and/or its affiliate Eastern Power Networks plc (registered company number 02366906) as applicable.
Underground cable	An insulated conductor carrying electric current designed for underground installation. Underground cables link together two Cable Sealing End compounds.
Zone of Influence	The defined geographic area within which the Project's environmental receptors are located.

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