



# The Sizewell C Project

## 6.5 Volume 4 Southern Park and Ride Chapter 7 Terrestrial Ecology and Ornithology

---

Revision: 1.0  
Applicable Regulation: Regulation 5(2)(a)  
PINS Reference Number: EN010012

---

May 2020

Planning Act 2008  
Infrastructure Planning (Applications: Prescribed  
Forms and Procedure) Regulations 2009



## Contents

7.	Terrestrial Ecology and Ornithology .....	1
7.1	Introduction.....	1
7.2	Legislation, policy and guidance.....	2
7.3	Methodology .....	9
7.4	Baseline environment .....	27
7.5	Environmental design and mitigation.....	36
7.6	Assessment.....	41
7.7	Mitigation and monitoring.....	51
7.8	Residual effects .....	53
	References .....	57

## Tables

Table 7.1: Requirements of the National Policy Statement for Energy (EN-1).....	4
Table 7.2: Requirements of the National Policy Statement for Nuclear Power Generation (EN-6). .....	6
Table 7.3: Summary of consultation responses that have informed the scope and methodology of the terrestrial ecology and ornithology assessment.....	11
Table 7.4: Specific Zone of Influence, study area and survey areas for ecological features. ....	18
Table 7.5: Environmental Impact Assessment criteria for the assessment of ecological value/sensitivity.....	20
Table 7.6: Assessment of magnitude of impact for terrestrial ecology and ornithology. ....	21
Table 7.7: Criteria for determining the impact on ecological features under Chartered Institute of Ecology and Environmental Management guidelines. ....	22
Table 7.8: Generic effect definitions. ....	23
Table 7.9: Summary and comparison of Environmental Impact Assessment and Chartered Institute of Ecology and Environmental Management based measures of significance of ecological effects. ....	24
Table 7.10: Determination of IEFs to be taken forward for detailed assessment. ....	33
Table 7.11: Summary of the proportion of each bat species' Core Sustenance Zone to be lost as a result of the proposed development. ....	43

Table 7.12: Terrestrial ecology and ornithology summary of effects arising during construction of the proposed development. .... 54

Table 7.13: Terrestrial ecology and ornithology summary of effects arising during operation of the proposed development. .... 55

Table 7.14: Terrestrial ecology and ornithology summary of effects arising during removal and reinstatement of the proposed development..... 56

## Figures

All figures are found within Annex 7A.1 of Appendix 7A: Ecological Baseline for the Southern Park and Ride at Wickham Market

Figure 7.1: Location of Non-statutory Designated Sites within 2km of the southern park and ride at Wickham Market.

Figure 7.2: Phase 1 Habitat Plan.

Figure 7.3: Southern park and ride at Wickham Market Great Crested Newt Surveys.

Figure 7.4: Red and NERC species recorded at southern park and ride at Wickham Market during the breeding bird surveys in April-June 2015.

Figure 7.5: Schedule 1 species recorded at southern park and ride at Wickham Market during Winter bird surveys in November- December 2014–January–March 2015.

Figure 7.6: Red and NERC species recorded at southern park and ride at Wickham Market during the Winter bird surveys in November- December 2014–January–March 2015.

Figure 7.7: Southern park and ride at Wickham Market Bat Tree Assessment Results 2015.

Figure 7.8: Southern park and ride at Wickham Market Activity Transect Routes and SM2 Locations 2014.

Figure 7.9: Location of common pipistrelle passes recorded during the southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014.

Figure 7.10: Location of soprano pipistrelle passes recorded during the southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014.

Figure 7.11: Location of barbastelle passes recorded during the southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014.

Figure 7.12: Location of big bat passes recorded during the southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014.

Figure 7.13: Location of Myotis spp. passes recorded during the southern park and ride at Wickham Market activity transect routes 1 and 2 May to October 2014.

## Plates

**None provided.**

## Appendices

Appendix 7A: Southern park and ride at Wickham Market ecological baseline

## 7. Terrestrial Ecology and Ornithology

### 7.1 Introduction

7.1.1 This chapter of **Volume 4** of the **Environmental Statement (ES)** presents an assessment of the terrestrial ecology and ornithology effects arising from the construction, operation and removal and reinstatement use of the southern park and ride at Wickham Market (referred to throughout this volume as the ‘proposed development’). This includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual effects.

7.1.2 Detailed descriptions of the southern park and ride at Wickham Market site (referred to throughout this volume as the ‘site’), the proposed development and the different phases of development are provided in **Chapters 1 and 2** of this volume of the **ES**. A glossary of terms and list of abbreviations used in this chapter is provided in **Appendix 1A** of **Volume 1** of the **ES**.

7.1.3 This assessment has been informed by data from other assessments as follows:

- **Chapter 10:** Transport, of **Volume 2** of the **ES**.
- **Chapter 4:** Noise and vibration, of this volume.
- **Chapter 5:** Air quality, of this volume.
- **Chapter 6:** Landscape and visual (including lighting), of this volume.
- **Chapter 10:** Soils and agriculture, of this volume.
- **Chapter 12:** Groundwater and surface water, of this volume.

7.1.4 This assessment has been informed by data presented in the following technical appendix:

- **Appendix 7A:** Southern park and ride at Wickham Market ecological baseline.

## 7.2 Legislation, policy and guidance

7.2.1 **Appendix 6J** of **Volume 1** of the **ES** identifies and describes legislation, policy and guidance of relevance to the assessment of the potential terrestrial ecology and ornithology impacts associated with the Sizewell C Project across all **ES** volumes.

7.2.2 This section provides an overview of the specific legislation, policy and guidance of relevance to the southern park and ride at Wickham Market assessment.

### a) International

7.2.3 International legislation and policies relating to the terrestrial ecology and ornithology assessment include:

- Convention on Biological Diversity (Ref. 7.1).
- Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (Ref. 7.2).
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive) (Ref. 7.3).
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) (Ref. 7.4).
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (Ref. 7.5).
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (Ref. 7.6).

7.2.4 The requirements of these, as relevant to the terrestrial ecology and ornithology assessment, are set out in **Appendix 6J** of **Volume 1** of the **ES**.

### b) National

7.2.5 National legislation and policies relating to the terrestrial ecology and ornithology assessment include:

- Wildlife and Countryside Act (Ref. 7.7).
- Conservation of Habitats and Species Regulations (Habitat Regulations) (Ref. 7.8).
- Countryside and Rights of Way Act (Ref. 7.9).

- Natural Environment and Rural Communities (NERC Act) Act (Ref. 7.10).
- Hedgerows Regulation (Ref. 7.11).
- Protection of Badgers Act (Ref. 7.12).
- UK Biodiversity Action Plan BAP (Ref. 7.13) (now superseded by the 'UK Post-2010 Biodiversity Framework' (Ref. 7.14)).
- Planning Practice Guidance (Ref. 7.15).
- Government's 25 Year Environment Plan (Ref. 7.16).
- National Planning Policy Framework (Ref. 7.17).
- National Policy Statements (NPSs) for Energy (Ref. 7.18).

**7.2.6** The requirements of these, as relevant to the terrestrial ecology and ornithology assessment, are set out in **Appendix 6J** of **Volume 1** of the **ES**.

**7.2.7** The NPS 2011 sets out the national policy for energy infrastructure. The overarching NPS for Energy (NPS EN-1) (Ref. 7.18), and NPS for Nuclear Power Generation (NPS EN-6) (Ref. 7.18) provide the primary policy framework within which the development will be considered. A summary of the relevant planning policy, together with consideration of how the advice has been taken into account is provided in **Appendix 6J** of **Volume 1** of the **ES**, with requirements specific to this site set out in **Table 7.1** and **Table 7.2**.

**Table 7.1: Requirements of the National Policy Statement for Energy (EN-1).**

Ref.	NPS Topic Requirement	How the Requirement has been Addressed in Relation to Terrestrial Ecology and Ornithology
EN-1 4.3.	<p><i>“Under the Habitats and Species Regulations consideration must be given to whether the project may have a significant effect on a European site, or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects. In the event that an Appropriate Assessment is required, the applicant must provide information as may reasonably be required to enable the Appropriate Assessment to be conducted. This should include information on any mitigation measures that are proposed to minimise or avoid likely effects.”</i></p>	<p>A Habitat Regulations Assessment (HRA) Screening assessment is included in the <b>Shadow HRA Report</b> for the Sizewell C Project (Doc Ref. 5.10). The <b>Shadow HRA Report</b> considers the possible pathways whereby the proposed development (in this case the the northern park and ride site at Darsham) could have a significant effect on a European site. It concludes that whilst possible pathways do exist, there is no potential for a significant effect.</p>
EN-1 5.2.3.	<p><i>“A particular effect of air emissions from some energy infrastructure may be eutrophication, which is the excessive enrichment of nutrients in the environment. Eutrophication from air pollution results mainly from emissions of NOx and ammonia. The main emissions from energy infrastructure are from generating stations. Eutrophication can affect plant growth and functioning, altering the competitive balance of species, and thereby damaging biodiversity. In aquatic ecosystems it can cause changes to algal composition and lead to algal blooms, which remove oxygen from the water, adversely affecting plants and fish. The effects on ecosystems can be short-term or irreversible, and can have a large impact on ecosystem services such as pollination, aesthetic services and water supply.”</i></p>	<p>Air emissions have not been considered as a significant effect pathway due to the enforcement of the tertiary mitigation which would suitably protect neighbouring habitats, see <b>Chapter 5</b> of this volume for further details.</p>
EN-1 5.2.7.	<p><i>“The ES should describe... any potential eutrophication impacts.”</i></p>	<p>Please see explanation in relation to EN-1 5.2.3.</p>



Ref.	NPS Topic Requirement	How the Requirement has been Addressed in Relation to Terrestrial Ecology and Ornithology
EN-1 5.3.3.	<p><i>“Where the development is subject to Environmental Impact Assessment (EIA) the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity.”</i></p>	<p>There would be no significant effects on internationally designated sites (see EN-1 4.3).</p> <p>The potential impacts of the proposed development on locally designated sites of ecological conservation importance are addressed within <b>section 7.4</b>. These have been scoped out of the assessment in <b>Table 7.10</b> due to the distance from the proposed development, and the implementation of the primary and tertiary mitigation described in <b>section 7.5</b>.</p>
EN-1 5.3.18.	<p><i>“The applicant should include appropriate mitigation measures as an integral part of the proposed development. In particular, the applicant should demonstrate that:</i></p> <ul style="list-style-type: none"> <li><i>• during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;</i></li> <li><i>• during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;</i></li> <li><i>• habitats will, where practicable, be restored after construction works have finished; and</i></li> <li><i>• opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.”</i> </li></ul>	<p>Primary and tertiary mitigation is defined within <b>section 7.5</b>.</p> <p>The site boundary has been restricted to avoid the most sensitive habitats. Habitat would be restored to its original use (agriculture) during removal and reinstatement.</p>

**Table 7.2: Requirements of the National Policy Statement for Nuclear Power Generation (EN-6).**

Ref.	NPS Topic Requirement.	How the Requirement has been Addressed in Relation to Terrestrial Ecology and Ornithology
<p><b>EN-6 1.7.4.</b></p> <p><b>EN-6 Annex A A.7.4.</b></p> <p><b>EN-6 Annex C C.8.54.</b></p>	<p><i>“Possible adverse effects on nature conservation sites of European importance were identified by the Nuclear HRA. Further studies will need to be carried out, as part of the project HRA and EIA processes for individual development consent applications, to determine the significance of the effects and the effectiveness of any mitigation measures.”</i></p> <p><i>“Possible significant adverse effects on nationally important nature conservation sites and designated landscapes were identified by the Nuclear Appraisal of Sustainability. Further studies will need to be carried out, as part of the project EIA process for individual development consent applications, to determine the significance of the effects, and the effectiveness of any mitigation measures.”</i></p> <p><i>“All project level HRA must take account of the potential adverse effects and the proposed avoidance and mitigation measures identified through the strategic level assessment(s).”</i></p> <p><i>“The HRA on-sites of international importance has proposed a suite of avoidance and mitigation measures to be considered as part of the project level HRA. At this stage, it is assessed that the effective implementation of the proposed suite of avoidance and mitigation measures may help to address adverse effects on European Site integrity, but that more detailed project level HRA is required to reach conclusions that are in accordance with the requirements of the Habitats Directive.”</i></p>	<p>A HRA Screening assessment is included in the <b>Shadow HRA Report</b> for the Sizewell C Project (Doc Ref. 5.10).</p> <p>The <b>Shadow HRA Report</b> considers the possible pathways whereby the proposed development (in this case the northern park and ride site at Darsham) could have a significant effect on a European site. It concludes that whilst possible pathways do exist, there is no potential for a significant effect.</p> <p>Within this <b>ES</b>, the methodology to determine the ecological baseline and baseline for terrestrial ecology and ornithology is detailed within <b>section 7.3, section 7.4</b> and <b>Appendix 7A</b> of this volume. <b>Section 7.4</b> also identifies the Important Ecological Features (IEFs), for which the impacts have been assessed within <b>section 7.6</b>.</p>
<p><b>EN-6 Annex C C.8.53</b></p>	<p><i>“A precautionary approach suggests that the assessment at this strategic level cannot rule out the potential for adverse effects on the integrity of nine European Sites (Alde-Ore and Butley Estuaries Special Area of Conservation (SAC), Alde-Ore Estuary Special Protection Area (SPA)/Ramsar, Minsmere to Walberswick Heaths and Marshes SAC,</i></p>	<p>As detailed within <b>section 7.4</b>, an assessment showed there are no statutory designated sites of nature conservation importance within 5 kilometres (km) of the site.</p>

Ref.	NPS Topic Requirement.	How the Requirement has been Addressed in Relation to Terrestrial Ecology and Ornithology
	<p><i>Minsmere to Walberswick SPA/ Ramsar, Orfordness-Shingle Street SAC, Sandlings SPA, Outer Thames Estuary SPA) through potential impacts on water resources and quality, habitat and species loss and fragmentation, and disturbance (noise, light and visual)."</i></p>	

## c) Regional

7.2.8 Regional policies relating to the terrestrial ecology and ornithology assessment include:

- Suffolk Nature Strategy (Ref. 7.19).
- Suffolk Local Biodiversity Action Plan (BAP) (Ref. 7.20).
- Suffolk's Priority Species and Habitats list (Ref. 7.21).

7.2.9 The requirements of these, as relevant to the terrestrial ecology and ornithology assessment, are set out in **Appendix 6J** of **Volume 1** of the **ES**.

## d) Local

7.2.10 Local policies relating to the terrestrial ecology and ornithology assessment include:

- Suffolk Coastal District Council Local Plan Core Strategy and Development Management Policies (Ref. 7.22).
- Suffolk Coastal District Council Final Draft Local Plan (Ref. 7.23).

7.2.11 The requirements of these, as relevant to the terrestrial ecology and ornithology assessment, are set out in **Appendix 6J** of **Volume 1** of the **ES**.

## e) Guidance

7.2.12 This assessment has been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EclA) (Ref. 7.24), in order to provide the determining body with clear and concise information about the likely significant ecological effects associated with the proposed development. In addition, the following guidance documents were considered during the survey and assessment process.

- Handbook for Phase 1 Habitat survey – a technique for environmental audit (Ref. 7.25).
- Bird Monitoring Methods: A Manual of Techniques for Key UK Species (Ref. 7.26).
- UK Birds of Conservation Concern (Ref. 7.27).
- Red Data Book of British Invertebrates (Ref. 7.28).

- Hedgerows Regulations Guidelines.
- Technical Information Note 102 – Reptile Mitigation Guidelines (Ref. 7.29).
- Great crested newt (*Triturus cristatus*) mitigation guidelines (Ref. 7.30).
- Evaluating the suitability of habitat for the great crested newt (Ref. 7.31).
- Natural England. Standing advice for local planning authorities who need to assess the impacts of development on badgers (*Meles meles*) (Ref. 7.32).
- Bat Surveys: Good Practice Guidelines, 2nd edition (Ref. 7.33). Please note all bat surveys were conducted in accordance with, or above, the requirements within the guidance in place at the time of survey. Although this guidance was updated in 2016, the surveys undertaken are suitable for assessment as agreed through ongoing consultation as part of the assessment process.

## 7.3 Methodology

### a) Scope of the assessment

- 7.3.1 The generic EIA methodology is detailed in **Volume 1, Chapter 6** of the **ES**.
- 7.3.2 The full method of assessment for terrestrial ecology and ornithology that has been applied for the Sizewell C Project is included in **Appendix 6J** of **Volume 1** of the **ES**.
- 7.3.3 This section provides specific details of the terrestrial ecology and ornithology methodology applied to the assessment of the proposed development, and a summary of the general approach to provide appropriate context for the assessment that follows. The scope of assessment considers the impacts of the construction, operation, and removal and reinstatement of the proposed development.
- 7.3.4 Under the CIEEM guidelines habitats and species considered sufficiently important (in nature conservation terms) to be a material consideration in the planning decision, as well as legally protected and/or controlled species for which there is a potential for a breach of their respective legislation as a result of the proposed development, are considered to be IEFs. Ecological features can be important for a variety of reasons (e.g. quality and extent of designated sites or habitats, habitat/species rarity).
- 7.3.5 To comply with the CIEEM Guidelines for EclA, **section 7.4** of this chapter identifies the IEFs that are of sufficient importance, and likely to be sufficiently

affected by the proposed development, so as to be a material consideration in the planning decision, and require a more detailed assessment. **Section 7.4** also identifies IEFs that are not likely to be significantly affected, and so do not require further assessment; that is, they can reasonably be scoped out of the EclA.

**7.3.6** The scope of this assessment has been established through a formal EIA scoping process undertaken with the Planning Inspectorate (PINS). A request for an EIA scoping opinion was initially issued to the PINS in 2014, with an updated request issued in 2019, provided in **Appendix 6A** of **Volume 1** of the **ES**.

**7.3.7** Comments raised in the EIA scoping opinion received in 2014 and 2019 have been taken into account in the development of the assessment methodology. These are detailed in **Appendices 6A** to **6C** of **Volume 1** of the **ES**.

**b) Consultation**

**7.3.8** The scope of the assessment has also been informed by ongoing consultation and engagement with statutory consultees throughout the design and assessment process. A summary of the comments raised and SZC Co.'s responses are detailed in **Table 7.3**.

**Table 7.3: Summary of consultation responses that have informed the scope and methodology of the terrestrial ecology and ornithology assessment.**

Consultee	Date	Comment	EDF Energy Response
Royal Society for the Protection of Birds (Letter).	5 February 2013. Stage 1 Consultation.	<i>“Ecological surveys should be undertaken to understand [the] impacts of developing this site. The survey data should then be used to inform opportunities for enhancing the development for wildlife [which] should be sought wherever possible. These should include the use of native species for the screen planting, and could also include the construction of wildlife ponds, wildflower planting and bird box provision. The wildlife value of the sites post-use should be enhanced in order to retain and, wherever possible, improve the aforementioned features.”</i>	Site-specific surveys were conducted for the proposed development that included extended Phase 1 Habitat surveys, amphibian surveys, reptile surveys, bat surveys, and ornithological (breeding and wintering) surveys.  Following the return of the proposed development site to agricultural use, the habitats present could be enhanced through the re-planting and/or reinforcement of boundary hedgerows where found to be gaps, subject to landowner negotiation. Doing so would enhance the quality, and increase the suitability of this habitat for a range of wildlife including bats, breeding birds, and small mammals.
Suffolk Coastal District Council (SCDC) (Letter).	5 February 2013. Stage 1 Consultation.	<i>“The assessments of the environmental impacts of the proposed sites appear to be -based. Local wildlife designations and species records have not been examined.”</i>	Statutory designated sites within 5km, and non-statutory sites within 2km have been identified. In addition, species records have been requested, and included within the baseline and assessment. <b>Appendix 7A</b> of this volume provides the full ecological baseline for the proposed development.
		<i>“The majority of the sites propose the use of extensive lighting. This has the potential to have a significant impact on bats. There is therefore a significant risk that habitats for both feeding and roosting will be unavailable for the period of the construction of Sizewell C.”</i>	Surveys for bats included bat roost assessment, static and activity surveys. Full details of the methodology of this is within <b>Appendix 7A</b> of this volume. While the surrounding woodland blocks were identified as being of high potential for bats, bat activity recorded within the proposed development was very low, and bats are not dependent on the habitats within the site.  Primary mitigation (described in <b>section 7.5</b> ) has been included so that there is a 10 metre (m) buffer between the proposed development, and any external woodland, and a close-boarded fence wherever the proposed development abuts woodland. The operational lighting design has ensured that light levels at the red line boundary do not exceed 0.1lux. Overall, no significant effect on the bat assemblage is expected.

Consultee	Date	Comment	EDF Energy Response
Suffolk County Council (SCC) (Letter, reference EN010012).	22 May 2014 Scoping Opinion.	<i>“Ecological studies should have regard to biodiversity habitats and species. The study area for bats in particular will need to be agreed.”</i>	<b>Appendix 7A</b> of this volume provides the full ecological baseline for the proposed development. This also details the Zone of Influences (ZOIs) for bats, using published Bat Conservation Trust guidelines.
		<i>“Reference is made to potential ecological impacts on the River Deben – this will need to be picked up through the HRA process.”</i>	A HRA Screening Report is included in the <b>Shadow HRA Report</b> (Doc Ref. 5.10) for the Sizewell C Project. Please refer to <b>Book 5</b> .
Suffolk County Council (SCC) (Letter, reference EN010012).	22 May 2014 Scoping Opinion.	<i>“Ecological studies should have regard to biodiversity habitats and species. The study area for bats in particular will need to be agreed.”</i>	<b>Appendix 7A</b> of this volume provides the full ecological baseline for the proposed development. This also details the ZOIs for bats, using published Bat Conservation Trust guidelines.
		<i>“Reference is made to potential ecological impacts on the River Deben – this will need to be picked up through the HRA process.”</i>	A HRA Screening Report is included in the <b>Shadow HRA Report</b> for the Sizewell C Project. Please refer to <b>Book 5</b> .
Natural England (Letter, reference 202551).	2 February 2017 Stage 2 Consultation.	<i>“Full surveys for protected species need to be carried out and suitable mitigation provided for any identified impacts.”</i>	Site-specific surveys were conducted for the proposed development that included extended Phase 1 Habitat surveys, amphibian surveys, reptile surveys, bat surveys and ornithological (breeding and wintering) surveys. <b>Appendix 7A</b> of this volume includes the full methodology and results of these surveys.
SCDC and SCC (Letter).	February 2017 Joint response to Stage 2 Consultation.	<i>“We would expect to see the same ecological mitigation measures for lighting at the southern park and ride site (particularly given Whin Belt is known to support bats) (Table 10.2 pp.235), as EDF Energy has proposed at the northern park and ride site, given the proximity of woodland on both sites, both with records of bats.”</i>	Surveys for bats included bat roost assessment, static and activity surveys. Full details of the methodology of this is within <b>Appendix 7A</b> of this volume. While the surrounding woodland blocks were identified as being of high potential for bats, bat activity recorded within the proposed development was very low, and bats are not dependent on the habitats within the site.  Primary mitigation, referred to in <b>section 7.5</b> , has been included so that there is a 10m buffer between the proposed development, and any external woodland and close-boarded fence wherever the proposed development abuts woodland. The operational lighting design minimises



Consultee		Date	Comment	EDF Energy Response
				light levels, which at the site boundary largely do not exceed 0.1lux, with lighting levels between 1.0 and 0.1lux in a few locations.
Suffolk Wildlife Trust	Wildlife	2 February 2017 Stage 2 Consultation.	<p><i>“Tables 9.2 and 10.2 identify the preliminary environmental information for the southern park and ride area, however as no ecological survey information is provided in the consultation it is not possible to provide detailed comments on these options or the impacts and mitigation measures which have been identified in the tables.</i></p> <p><i>Notwithstanding the above, we note that Table 10.2 identifies that construction and operation noise and lighting at the southern park and ride may have an adverse impact on roosting and foraging bats. However, no reference is made to mitigating these impacts in the mitigation measures section.”</i></p>	A full suite of ecology surveys were undertaken at the site and full assessment of the effects of the proposed development on ecological receptors has been undertaken with appropriate primary and tertiary mitigation detailed in <b>section 7.5</b> .
Natural England.	England.	2 February 2017. Stage 2 Consultation.	<i>“Full surveys for protected species need to be carried out and suitable mitigation provided for any identified impacts.”</i>	Site-specific surveys were conducted for the site. <b>Appendix 7A</b> of this volume includes the full methodology and results of these surveys. <b>section 7.5</b> provides details of primary and tertiary mitigation.
Suffolk County Council and Suffolk Coastal District Council	County and District	2 February 2017. Stage 2 Consultation.	<i>“We would expect to see the same ecological mitigation measures for lighting at the southern Park and Ride site (particularly given Whin Belt is known to support bats) (Table 10.2 pp.235), as EDF Energy has proposed at the northern Park and Ride site, given the proximity of woodland on both sites, both with records of bats.”</i>	<p>The proposed lighting mitigation for the proposed developments follows that proposed for the northern Park and Ride site, detailed in <b>section 7.5</b>:</p> <p>Operational lighting would be designed so that light spill beyond the site boundary would be minimal (largely less than 0.1lux, with lighting levels between 1.0 and 0.1 lux in only several locations), and there would be no substantive light spillage into adjacent habitats and woodland blocks including Whin Belt. The lighting design for the proposed development</p>

Consultee		Date	Comment	EDF Energy Response
				would comply with the lighting strategy and use light fittings chosen to limit stray light.
Suffolk Council Suffolk Coastal Council	County and District	10 April 2019. Stage Consultation.	3 “We would strongly encourage any mitigation tree and / or hedge planting to be sited in such a way that it may remain in place after post-construction site clearance so that there is a permanent enhancement of landscape character.”	Soft landscaping, including grassed areas, tree and shrub planting would be installed and maintained for the operation of the proposed development. There would also be temporary hedgerow planting along the access road, whilst the park and ride is operational, to replace hedgerows lost during construction, and would be re-planted along the original hedgerow line during the removal and reinstatement phase.
Suffolk Council Suffolk Coastal Council	County and District	10 April 2019. Stage Consultation.	3 “A detailed assessment of the impacts of construction and operation of the site on the ecology and how they will be mitigated will be required. This will need to include the use of lighting outside of operational hours. Ponds will need to be assessed for, inter alia, great crested newts, and an appropriate mitigation strategy agreed with Natural England.”	Site-specific surveys were conducted for the site. <b>Appendix 7A</b> of this volume includes the full methodology and results of these surveys. <b>Section 7.5</b> provides details of primary and tertiary mitigation.  No great crested newts were recorded within 500m of the site, and only small numbers of other amphibians (common frog, smooth and palmate newts) were found within ponds within the study area.
Suffolk Council Suffolk Coastal Council	County and District	10 April 2019. Stage Consultation.	3 “Existing ponds have been identified on the site (Vol. 2B paragraph 9.11.4), although it is unclear whether these ponds are proposed to be kept throughout construction and operation. Any alteration in overland flows that may feed these ponds may result in the ecological deterioration of the ponds due to the lack of water supply.”	Pond 59 located within the site, close to the western boundary, would be retained, and so there would be no direct loss of this habitat, and its associated species. This pond would be further protected by a buffer area of a minimum of 10m between the pond, and the proposed perimeter fence, within which no construction or permanent development would be permitted.  There would be no dewatering as part of the proposed development. In addition, the design of the Sustainable Drainage System (SuDS) infrastructure would allow for surface water run-off to be returned to ground at green field rates,

NOT PROTECTIVELY MARKED

Consultee	Date	Comment	EDF Energy Response
Environment Agency	29 March 2019 Stage 3 Consultation	<i>“Any works within close proximity to riverine habitat which supports otter and water vole has the potential to detrimentally impact protected species.”</i>	Although records for otter and water vole were recorded within the ZOI of the proposed development, during surveys, no habitat suitable for otter or water vole was identified, therefore these species were not considered during the assessment and no mitigation for these species has been included for this site.
Natural England	9 April 2019 Stage 3 Consultation	<i>“There is an opportunity to consider the risk of vehicles to wildlife, especially as protected species such as otters have been identified to be present within the vicinity. Although a road network already exists, extending or expanding the roads does not reduce the risk of impact from vehicles.”</i>	Incidental mortality of species during the construction and operational phases of the proposed development due to vehicle collision has been assessed fully within this chapter.  Although records for otter were recorded within the ZOI of the proposed development, during surveys, no habitat suitable for otter was identified,
Natural England	9 April 2019 Stage 3 Consultation	<i>“With regards to the proposed southern park and ride, it is written that Whin Belt will be retained in its entirety (Vol 2B, para 9.3.13, pg. 482). However, on comparing aerial photos available via internet searches with the plan on Figure 14.2 (Vol 1, pg. 352) it appear there will be loss of trees within the development boundary at the south east end of Whin Belt. This is illustrated on the figure as a grassed area surrounded by planting. It is also noted that three trees with potential to support roosting bats are to be removed. Therefore, it is advised that further consideration should be given to the layout in order to minimise the loss of trees on site. Seeing as an active badger sett is located 130 m to the east of the site (Vol 2B, para 9.3.11, pg. 482), it is strongly advised that the proposed bunding is proofed to prevent excavation by badgers. Badger proof fencing constructed of chain link netting (galvanised wire of 2.5 mm gauge) or weld-mesh material, should be secured over the bunding. We are unable to provide further comment until full surveys for protected</i>	Woodland blocks on the perimeter, including Whin Belt, would be retained in their entirety, and so there would therefore be no direct loss of this habitat and its associated species. A buffer distance of 10m between the woodland, and the proposed perimeter fence would be maintained along sections of the boundary, namely along the southern, eastern and, where adjacent to woodland blocks, the western boundaries. There would be no construction or permanent development within this buffer area.  Three trees with the potential to support roosting bats (two high potential and one low potential). From the construction phase assessment undertaken, it is considered that the loss of three trees with roost potential would not impair the ability of the bat assemblage present to roost. To mitigate for the loss of the tree and potential roost resources, bat boxes would be installed on retained trees in suitable locations within the site boundary, prior to felling. A variety of bat boxes would be used to support different species.

Consultee	Date	Comment	EDF Energy Response
		<i>species have been carried out and mitigation/ compensation proposals provided for any identified impacts.”</i>	The landscape bunds would be bounded by badger fencing which would prevent colonisation by this species and so minimise constraints during the removal and reinstatement phase.
Natural England	9 April 2019 Stage Consultation	3 <i>“We advise that these aspects of the proposals presents good opportunities for biodiversity creation through the planting up of landscaped areas with native species. However, we note that the intention here is to restore the site to agricultural use following construction of the power station (Vol 1, para 2.8.3, pg. 32); this should therefore be taken into account when considering these aspects in terms of potential environmental net gain when assessed against the current baseline value of the sites.”</i>	The proposed landscaping of the site following re-instatement allows for the native tree and shrub planting installed as part of the construction and operational phase to remain in situ.
Suffolk Wildlife Trust	8 April 2019 Stage Consultation	3 <i>“Paragraphs 8.3.30 and 9.3.30 identify that full ecological assessment of these sites is still to be completed, however Tables 8.3.1; 8.3.2; 9.3.1 and 9.3.2 set out the summaries of effects for the construction and operation of both sites. These do not identify any significant impacts on ecological receptors due to the inclusion of embedded mitigation measures within the developments. However, in the absence of complete ecological survey and assessment it is not possible to conclude that the embedded mitigation measures proposed are sufficient to ensure that the proposals will not result in significant adverse impacts on the ecological receptors identified.”</i>	A full suite of ecology surveys were undertaken at the site and full assessment of the effects of the proposed development on ecological receptors has been undertaken with appropriate primary and tertiary mitigation detailed in <b>section 7.5</b> .
Suffolk Wildlife Trust	8 April 2019 Stage Consultation	3 <i>“as at Darham, we suggest the significant areas of grassland are managed to maximise nesting opportunities for skylark, to help mitigate the inevitable loss of skylark territories across the site. We also strongly recommend hedge and scrub planting with native species to strengthen corridors and</i>	A full suite of ecology surveys were undertaken at the site and full assessment of the effects of the proposed development on ecological receptors has been undertaken with appropriate primary and tertiary mitigation detailed in <b>section 7.5</b> .

Consultee	Date	Comment	EDF Energy Response
		<p><i>around the perimeter of the site. Verges and other suitable grass areas should be planted with wildflower mixes suitable for the soil type and managed with one late season cut.”</i></p>	<p>Soft landscaping, including grassed areas, tree and shrub planting would be installed and maintained for the operation of the proposed development. There would also be temporary hedgerow planting along the access road, whilst the park and ride is operational, to replace hedgerows lost during construction, and would be re-planted along the original hedgerow line during the removal and reinstatement phase.</p>

c) Study area

- 7.3.9 The study area includes the land within the site, and the ZOI of the proposed development. Due to the variable sensitivity of terrestrial ecology and ornithology receptors, the ZOI (and therefore the study area) differs depending on the receptor considered.
- 7.3.10 The survey area for which baseline data was collected is defined as “*the geographical extent over which a particular field survey activity took place.*” The survey area differed depending on the receptor being surveyed.
- 7.3.11 Ecological features have been considered within the site and its immediate environs, taking into account their legislative protection, their conservation status, and their status/distribution in the vicinity of the site, as well as desk-study information and baseline surveys. **Appendix 7A** of this volume provides the full ecological baseline for the proposed development.
- 7.3.12 Areas and resources that may be affected by the identified activities arising from the proposed development were considered. These areas and resources identify the ZOI. The ZOI is defined as “*the area over which ecological features may be affected by potential biophysical changes caused by a proposed project and associated activities*”.
- 7.3.13 The ZOIs have been developed as species/species assemblage-appropriate distances from the site boundary, taking into account varying mobility. Based on the process set out above, **Table 7.4** defines the ZOI, study area and survey area for the ecological features of relevance to this assessment.

**Table 7.4: Specific Zone of Influence, study area and survey areas for ecological features.**

Ecological Feature.		ZOI	Study Area.	Survey Area.
Designated sites.	Statutory designated.	5km	5km	N/A
	Non-statutory designated.	2km	2km	N/A
Plants and habitats.		2km	2km	Within the site boundary. <sup>1</sup>
Invertebrates		2km	2km	Not surveyed as habitat unsuitable.
Reptile		2km	2km	Not surveyed as habitat largely suboptimal.

<sup>1</sup> Note that ‘within the red line boundary’ includes land directly to the west of the current red line boundary, which was included within the red line boundary defined at the time of survey.

**NOT PROTECTIVELY MARKED**

Ecological Feature.		ZOI	Study Area.	Survey Area.
Amphibians		2km	2km	Within the site boundary <sup>1</sup> and a 500m buffer area. <sup>2</sup>
Birds		2km	2km	Within the site boundary. <sup>1</sup>
Bats	Natterer's bat ( <i>Myotis nattereri</i> ).	4km	4km	Within the site boundary <sup>1</sup> and a 400m area to the north of the scheme to include important adjacent habitats such as woodland and hedgerows.
	Noctule ( <i>Nyctalus noctula</i> ).	4km	4km	
	Leisler's bat ( <i>Nyctalus leisleri</i> ).	3km	3km	
	Common pipistrelle ( <i>Pipistrellus pipistrellus</i> ).	2km	2km	
	Soprano pipistrelle ( <i>Pipistrellus pygmaeus</i> ).	3km	3km	
	Nathusius' pipistrelle ( <i>Pipistrellus nathusii</i> ).	3km	3km	
	Serotine ( <i>Eptesicus serotinus</i> ).	4km	4km	
	Barbastelle ( <i>Barbastella barbastellus</i> ).	10km	10km	
	Brown long-eared bat ( <i>Plecotus auritus</i> ).	3km	3km	
Terrestrial mammals.		2km	2km	Included as part of extended Phase 1 habitat and protected species survey within the site boundary.

7.3.14 Additionally, a **Shadow HRA Report** (Doc Ref. 5.10) assessment has been undertaken which considers the site in the context of possible impacts on European sites, and a project-wide **Water Framework Directive (WFD) compliance assessment** has been undertaken (Doc Ref. 8.14) which also considers a number of the Important Ecological Features in the context of the WFD.

<sup>2</sup> This is in accordance with standing advice from Natural England for assessing the impacts of developments on great crested newts (Natural England, 2015).

d) **Assessment scenarios**

7.3.15 The assessment of effects on terrestrial ecology and ornithology is based on each of the construction, operation and removal and reinstatement phases of the proposed development, rather than specific assessment years.

e) **Assessment criteria**

7.3.16 As described in **Chapter 6** of this volume, the EIA methodology considers whether impacts of the proposed development would have an effect on any resources or receptors. Assessments broadly consider the magnitude of impacts and value/sensitivity of resources/receptors that could be affected in order to classify effects.

7.3.17 A detailed description of the assessment methodology used to assess the potential effects on terrestrial ecology and ornithology arising from the proposed development is provided in **Appendix 6J** of **Volume 1** of the **ES**. A summary of the assessment criteria used in this assessment is presented in the following sub-sections.

f) **Sensitivity**

7.3.18 The definitions of value and sensitivity criteria used in this assessment are set out in **Table 7.5**. Value and sensitivity are assessed separately, as they are to an extent independent of each other.

**Table 7.5: Environmental Impact Assessment criteria for the assessment of ecological value/sensitivity.**

Importance/ Sensitivity.	Guidelines
High	Value: feature/receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site/receptor (for example designated features of international/national importance, such as SACs, SPAs, Ramsar sites and Sites of Special Scientific Interest (SSSIs)). Sensitivity: feature/receptor has a very low capacity to accommodate the proposed form of change.
Medium	Value: feature/receptor possesses key characteristics which contribute significantly to the distinctiveness and character of the site/receptor (for example designated features of regional or county importance such as County Wildlife Sites (CWSs), and local BAP species). Sensitivity: feature/receptor has a low capacity to accommodate the proposed form of change.
Low	Value: feature/receptor only possesses characteristics which are locally significant. Feature/receptor not designated or only designated at a district or local level (for example Local Nature Reserves).



Importance/ Sensitivity.	Guidelines
	Sensitivity: feature/receptor has some tolerance to accommodate the proposed change.
Very low.	Value: feature/receptor characteristics do not make a significant contribution to local character or distinctiveness. Feature/receptor not designated. Sensitivity: feature/receptor is generally tolerant and can accommodate the proposed change.

7.3.19 The sensitivity of individual IEFs within the ZOI of the proposed development is determined within **section 7.6** where the potential impacts on IEFs are described. Different IEFs have different levels of sensitivity, depending upon the type of impact being described as well as the predicted duration, extent and magnitude of the impact. The sensitivity of individual IEFs has been qualified, where sufficient information exists. In the absence of detailed information, then professional judgement has been used to determine the sensitivity of individual IEFs.

7.3.20 In addition, in line with the CIEEM guidelines, the importance of an ecological feature, as determined with reference to legal, policy and/or nature conservation considerations, has been assessed within the following geographical context:

- International and European importance.
- National importance (i.e. UK and England).
- Regional importance (i.e. the East of England).
- County importance (i.e. Suffolk).
- Local importance, including an assessment with a Suffolk Coastal District context, or within the ZOI of the proposed development.

g) **Magnitude**

7.3.21 **Table 7.6** sets out the thresholds that have been used in the definition of the different scales of magnitude of impact to act as a guide for the assessment.

**Table 7.6: Assessment of magnitude of impact for terrestrial ecology and ornithology.**

Magnitude	Guidelines
High	Large-scale, permanent/irreversible changes over a large area; for example, loss of greater than 30% of designated site/habitat used by an ecological receptor or greater than 30% loss of a species population within the development area (where this can be determined).

Magnitude	Guidelines
Medium	Medium-scale, permanent/irreversible changes; for example, loss of between 5 and 30% of designated site/habitat used by an ecological receptor or loss of between 5 and 30% of a species population within the development area (where this can be determined).
Low	Noticeable but small-scale change over a partial area; for example, loss of between 1 and 5% of designated site/habitat used by a receptor or loss of a few individuals of a species population.
Very low.	Noticeable, but very small-scale change; for example, less than 1% of designated site/habitat used by an ecological receptor.

7.3.22 Where possible, magnitude of impact has been quantified taking account of not only the habitat or species resource within the site but also within the wider area, as appropriate. For example, for bats, consideration has been given to the Core Sustenance Zone (CSZ) for each species, but also habitat quality within the CSZ.

7.3.23 In compliance with the CIEEM guidelines impacts on biodiversity are assessed not only by magnitude, but are also characterised and described as positive/negative together with their extent, duration, reversibility, timing and frequency (figures for percentage loss in **Table 7.6** are therefore indicative not absolute). **Table 7.7** provides impact criteria used in line with the CIEEM guidelines.

**Table 7.7: Criteria for determining the impact on ecological features under Chartered Institute of Ecology and Environmental Management guidelines.**

Characteristic	Criteria
Positive or negative.	Positive impact: a change that improves the quality of the environment. Positive impacts may also include halting or slowing an existing decline in the quality of the environment. Negative impact: a change that reduces the quality of the environment.
Extent	The spatial or geographic area over which the impact/effect may occur.
Magnitude	Refers to the size, amount, intensity and volume. It will be quantified if possible and expressed in absolute or relative terms.
Duration	Duration will be defined in relation to ecological characteristics (such as a species' lifecycle), as well as human timeframes. The duration of an activity may differ from the duration of the resulting effect caused by the activity. Effects may be described as short, medium or long-term and permanent or temporary. Where durations of short, medium, long-term and temporary are given in this assessment, they are defined in months/years where possible, and may vary depending on the IEF being assessed.
Frequency	The number of times an activity that will impact biodiversity will occur.

Characteristic	Criteria
Timing	The timing of an activity or change caused by the Sizewell C Project may result in an impact if this coincides with critical life-stages or seasons.
Reversibility	Irreversible: an effect from which recovery is not possible within a reasonable timescale or there is no reasonable change of action being taken to reverse it. Reversible: an effect from which spontaneous recovery is possible or which may be counteracted by mitigation.

7.3.24 Impacts can also be defined as being direct or indirect. A direct impact is defined as an impact resulting in the direct interaction of an activity with an environmental or ecological component. An indirect impact is defined as an impact on the environment which is not a direct result of a project or activity, often produced away from or as a result of a complex impact pathway.

h) Effect definitions

7.3.25 The definitions of effects for terrestrial ecology and ornithology are shown in **Table 7.8**, in line with the EIA methodology set out within **Volume 1, Chapter 6** of the **ES**.

**Table 7.8: Generic effect definitions.**

Effect	Description
Major	Effects, both adverse and beneficial, which are likely to be important considerations at a national to regional level because they contribute to achieving national/regional objectives, or, which are likely to result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Effects that are likely to be important considerations at a regional and county level.
Minor	Effects that could be important considerations at a local level.
Negligible	An effect that is likely to have a negligible or neutral influence, irrespective of other effects.

7.3.26 Following the classification of an effect as presented in **Table 7.8**, a clear statement is made as to whether the effect is ‘significant’ or ‘not significant’.

7.3.27 Under CIEEM guidelines the significance of an effect on the IEF(s) has been determined based on the analysis of the factors that characterise the impact (**Table 7.7**). A significant effect is defined as *“an effect that either supports or undermines biodiversity conservation objectives for the IEFs or for biodiversity in general.”*

7.3.28 Using the CIEEM guidelines and approach, significant effects are identified with regard to an appropriate geographical scale, using the following terms:

- Significant at the international level.

- Significant at the national level.
- Significant at the regional level.
- Significant at the county level.
- Significant at the local level.
- Not significant.

**7.3.29** In order to allow a consistent approach across all disciplines within this **ES**, the standard levels of significance defined in the CIEEM guidelines are set out in **Table 7.9**, alongside the equivalent definitions of effect used elsewhere in this **ES**. Therefore, as a deviation from the standard EIA methodology, minor effects identified within this chapter have been classified as significant at a local level.

**Table 7.9: Summary and comparison of Environmental Impact Assessment and Chartered Institute of Ecology and Environmental Management based measures of significance of ecological effects.**

Significance Following the CIEEM Guidelines.	Equivalent Effect Categories and Significance Definitions Following the Standard EIA Methodology Presented within Volume 1, Chapter 6.
Significant at the international level.	Major (= significant).
Significant at the national level.	Major (= significant).
Significant at the regional level.	Moderate (= significant).
Significant at the county level.	Moderate (= significant).
Significant at the local level.	Minor (= not significant).
Not significant.	Negligible (= not significant).

- f) **Assessment methodology**
  - i. **Establishing the baseline**

**Existing baseline**

**7.3.30** Baseline conditions were determined through a combination of a desk-study and field surveys. Technical data has been assimilated from survey work carried out between 2012 and 2018. A review was also conducted to determine any European and nationally designated sites located within 5km of the site. Through this method, habitat and species of importance were identified and assessed. **Appendix 7A** of this volume contains the detailed methodology and results of this baseline study and is summarised later.

- 7.3.31 The desk-study exercise comprised the following steps:
- Identification of designated sites (statutory and non-statutory) including SPA, SAC, Ramsar sites and SSSI within 5km and National Nature Reserve, Local Nature Reserves and CWSs within 2km.
  - Review of the Ancient Woodland Inventory information held on Multi-Agency Geographic Information for the Countryside website (Ref. 7.34).
  - Review of Suffolk Biodiversity Information Service, and/or the Joint Nature Conservation Committee records.
  - A review of the Suffolk BAP, Suffolk’s Priority Species and Habitats, and section 41 of the NERC Act.
- 7.3.32 A full account of the desk-study conducted for this EclA has been provided in **Appendix 7A** of this volume.
- 7.3.33 A suite of ecological survey work were undertaken within the site and/or its immediate surroundings (i.e. within the ZOI) during the period 2011–2018. The following surveys have been conducted within the ZOI:
- Extended Phase 1 habitat survey and protected species walkover.
  - Amphibian surveys.
  - Ornithological surveys (breeding and wintering).
  - Bat surveys (tree assessments, and activity and static surveys).
- 7.3.34 A review of aerial photographs and a 2018 site visit to check site conditions, confirmed that there have been no material changes to the habitats present within the site of the proposed development since the Extended Phase 1 habitat survey undertaken in 2014. Therefore, the Extended Phase 1 habitat survey was not repeated, and no targeted invertebrate, reptile or other mammal surveys were carried out.
- 7.3.35 **Appendix 7A** of this volume and its associated annexes contains the detailed methodologies and results of these surveys.

#### Future baseline

- 7.3.36 Given the relatively short operational life of the proposed development (9–12 years), the future baseline considers any committed development(s), or forecasted changes (e.g. climate change) that would materially alter the

baseline conditions during the construction, operation, and removal and reinstatement phases of the proposed development.

ii. **Assessment**

7.3.37 The assessment of effects on terrestrial ecology and ornithology is based on each of the construction, operation and removal and reinstatement phases of the proposed development, rather than specific assessment years.

iii. **Inter-relationships**

7.3.38 A number of inter-relationships and their effects have been considered on the different receptors, where relevant. This has included consideration of:

- noise;
- air quality;
- lighting; and
- groundwater and surface water.

g) **Assumptions and limitations**

7.3.39 The assessment is based on the prevailing ecological conditions which are not expected to change in the absence of the proposed development.

7.3.40 An assessment of individual trees within woodland blocks adjacent to the site, including Whin Belt (Target Note 9), the woodland block to the north of Whin Belt (Target Note 5), and the woodland block adjacent to the eastern boundary of the site (Target Note 1), the locations of which are shown on **Figure 7.2** in **Appendix 7A** of this volume, was not undertaken due to the absence of direct impacts from the site on these areas. An assessment was made of the general character of the woodland, and the likely presence of trees with the potential to support roosting bats. Where trees with the potential to support roosts were considered likely to be present, a precautionary baseline has been adopted for the purposes of the assessment, and it has been assumed that bats could be using these woodland blocks.

7.3.41 Access to Wonder Grove, the woodland block approximately 300m to the west of the site, Target Note 10 on **Figure 7.2** in **Appendix 7A** of this volume, was not granted and so was not surveyed. A similar precautionary approach to that discussed previously has been adopted.

## 7.4 Baseline environment

7.4.1 This section presents a description of the baseline environmental characteristics within the site and surrounding area in relation to terrestrial ecology and ornithology.

7.4.2 Further details can be found in **Appendix 7A** of this volume. Where a habitat or species is of conservation concern, this is stated, and the conservation status provided along with the appropriate legislation.

### a) Current baseline

#### i. Designated sites

7.4.3 No statutory designated sites of nature conservation importance were identified within the 5km ZOI of the site.

7.4.4 There are seven non-statutory designated CWSs within 2km of the site. These are: Catt’s Wood (also on the Ancient Woodland Inventory) (approximately 750m west), Great Wood Glevering Hall (also on the Ancient Woodland Inventory) (approximately 1.4km west), Lower Hacheston Meadow (approximately 420m west on the other side of the A12), The Oaks (also on the Ancient Woodland Inventory) (approximately 1.2km south on the other side of the A12), Copperas Wood (approximately 1.8km south-west on the other side of the A12), Ashe Abby Decoy Pond (approximately 1.7km south on the other side of the A12), and River Deben (approximately 1.6km west). CWSs support habitat types listed on section 41 of the NERC Act and are targeted for action in the Suffolk BAP, and Suffolk’s Priority Species and Habitats list, and are therefore of county importance under the CIEEM guidelines, and of medium importance under the EIA-specific methodology.

7.4.5 Full details of the reasons for designation are provided in **Appendix 7A** of this volume. The boundaries of the non-statutory designated sites within 2km are shown on **Figure 7.1** in **Appendix 7A** of this volume.

7.4.6 Due to the distance of the non-statutory designated sites (the closest of which is Lower Hacheston Meadow, approximately 430m west on the other side of the A12) from the site and since there would be no direct land take of these designated sites, and no obvious impact pathways have been identified, designated sites have been scoped out of the EIA, and are not be considered further within this assessment.

#### ii. Plants and habitats

7.4.7 **Figure 7.2** in **Appendix 7A** of this volume provides the Extended Phase 1 habitat map for the site.

- 7.4.8 The site comprises large arable fields growing intensively managed crops, separated by a track and bound by a mixture of fences and hedgerows. The crops are intensively managed and ‘clean’ (the site had, at the time of survey (2014), been treated with herbicide such that no scarce arable weeds or other notable plant species were identified). The 2018 site visit confirmed no substantial material changes to the habitats recorded during the extended Phase 1 habitat survey.
- 7.4.9 Eleven hedgerows have been identified in the study area, of which two (H1 and H5) are species-rich. Of these, one, H5 on **Figure 7.2** in **Annex 7A.1** of **Appendix 7A** of this volume, is ‘important’ when assessed against the Wildlife and Landscape Criteria of the Hedgerows Regulations. Hedgerows are included on Suffolk’s Priority Species and Habitats list, and are a habitat of principal importance under section 41 of the NERC Act. Several scattered trees are also identified around the site boundary.
- 7.4.10 Habitats within the study area consist of six woodland blocks, comprising broad-leaved plantation, broad-leaved semi-nature woodland and lowland mixed deciduous woodland, an improved grassland field, and an area of tall ruderals. A single pond, dry at the time of survey, is present within the site, Target Note 7 on **Figure 7.2** in **Appendix 7A** of this volume. There are five ponds within 500m of the site boundary, two of which are immediately adjacent to the west of the site boundary.
- 7.4.11 Habitats within the site are of no more than local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

### iii. Invertebrates

- 7.4.12 No records of protected or notable invertebrate species were identified within the site from the desk-study data. None of the habitats present within the site are of particular value to invertebrates, due to the intensively managed nature of the arable habitats present. Therefore, the invertebrate assemblage within the ZOI of the proposed development is of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

### iv. Amphibians

- 7.4.13 A single pond, dry at the time of survey, is present within the site, Target Note 7 on **Figure 7.2** in **Appendix 7A** of this volume, and there are a further five ponds, provided in **Figure 7.3** in **Appendix 7A** of this volume, within 500m of the site boundary. **Figure 7.3** in **Appendix 7A** of this volume also shows the location of a further three ponds which are just outside the 500m study area. No great crested newts were recorded during surveys. Low numbers



of smooth newt (*Lissotriton vulgaris*), palmate newt (*Lissotriton helveticus*) and common frog (*Rana temporaria*) were identified, none of which are included on Suffolk’s Priority Species and Habitats list.

7.4.14 Given the absence of great crested newts from the site and the study area, the amphibian assemblage is of local importance under the CIEEM guidelines, and very low importance under the EIA-specific methodology.

v. Reptiles

7.4.15 The closest reptile record is of an adder (*Vipera berus*) 600m to the north of the site. The majority of the site is considered unsuitable habitat for reptiles, and no evidence of reptiles was identified. However, an area of tall ruderals, woodland margins and the disused pit area south of Whin Belt are considered suitable foraging habitat for a small number of reptiles. Woodland adjacent to the site also has potential to provide hibernation sites.

7.4.16 All four common species of reptile (adder, grass snake (*Natrix helvetica helvetica*), common lizard (*Zootoca vivipara*) and slow-worm (*Anguis fragilis*) are included on Suffolk’s Priority Species and Habitats list, and under section 41 of the NERC Act. Given the limited potential for reptiles within the site and largely sub-optimal nature of the habitats present, the reptile assemblage is of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

vi. Ornithology

7.4.17 During breeding bird surveys (undertaken in 2014), ten bird species of nature conservation importance were identified, including: lapwing (*Vanellus vanellus*), linnet (*Carduelis cannabina*), skylark (*Alauda arvensis*), song thrush (*Turdus Philomena*), yellowhammer (*Emberiza citronella*), dunnock (*Prunella modularis*), lesser black-backed gull (*Larus fuscus*), meadow pipit (*Anthus pratensis*), stock dove (*Columba oenas*) and whitethroat (*Sylvia communis*).

7.4.18 During Winter bird surveys (undertaken in 2014–2015), 18 bird species of nature conservation importance were identified, including: fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*), grey partridge (*Perdix perdix*), herring gull (*Larus argentatus*), linnet, mistle thrush (*Turdus viscivorus*), skylark, song thrush, yellowhammer, bullfinch (*Pyrrhula pyrrhula*), dunnock, black-headed gull (*Chroicocephalus ridibundus*), greylag goose (*Anser anser*), kestrel (*Falco tinnunculus*), mallard (*Anas platyrhynchos*), meadow pipit, snipe (*Gallinago gallinago*), and stock dove. Habitats within the site are considered to support an assemblage of birds typical of the intensively managed arable habitats present. Full details of the species identified during the surveys are presented in **Figures 7.4, 7.5 and 7.6** in **Appendix 7A** of this volume.

7.4.19 The breeding and wintering bird assemblage within the ZOI is of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

vii. Bats

7.4.20 At least eight bat species have been recorded historically within the area, these being Natterer's bat, noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine, barbastelle and brown long-eared bat. Habitats within the site primarily consists of open arable land, which is of limited value for bats. However, the boundaries of the site, primarily hedgerows, as well as woodland blocks, are considered to provide suitable foraging, commuting<sup>3</sup> and roosting habitat.

7.4.21 Assessments of trees within the survey area identified 13 trees with bat roost potential (eight high potential, one medium potential, two low potential, and two undetermined), see **Figure 7.7** in **Appendix 7A** of this volume, as well as several adjacent woodland blocks which have the potential to support roosting bats.

7.4.22 Activity and static detector surveys identified at least seven species (*Myotis* spp., noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, barbastelle, and brown long-eared bat). Except for common and soprano pipistrelle activity, low levels of bat flight and foraging activity were recorded. The results of activity transect surveys are illustrated on **Figures 7.8–7.13** in **Appendix 7A** of this volume.

7.4.23 All bat species in the UK are protected under Schedule 5 of the Wildlife and Countryside Act and Schedule 2 of the Conservation of Habitats and Species Regulations. Five species (barbastelle, brown long-eared, lesser horseshoe, noctule and soprano pipistrelle bat) are listed as priority species on the Suffolk's Priority Species and Habitats list; these and two species not normally present in Suffolk (greater horseshoe and Bechstein's bat) are priority species in England under section 41 of the NERC Act. Barbastelle additionally receive protection under Annex II of the Habitats Directive. Given the presence of the species detailed previously, and the largely sub-optimal nature of the habitats present within the site the bat assemblage is of county importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

---

<sup>3</sup> Bats use woodland edges, hedgerows, rivers and other linear features like tree-lined footpaths as corridors to 'commute' from one area of countryside to another.

#### viii. Other mammals

- 7.4.24 Badger, European otter (*Lutra lutra*), water vole (*Arvicola amphibius*), brown hare (*Lepus europaeus*) and Western European hedgehog (*Erinaceus europaeus*) were identified from the desk-study as being present within the ZOI of the site. No records were within the site or immediately adjacent.
- 7.4.25 During surveys, no habitat suitable for otter or water vole was identified. Both are considered absent from the site boundary, and not considered further.
- 7.4.26 A (potential main) badger sett was identified within the vicinity of the site, while a latrine was identified along a hedgerow. No setts were recorded within the site boundary.
- 7.4.27 Hedgehog occur in a wide variety of habitat types including grasslands, forests and suburban areas (Ref. 7.35). However, the majority of the site is arable fields, and so unsuitable for hedgehog, and there were no records of hedgehogs during surveys. Hedgehog is on Suffolk's Priority Species and Habitats list, and listed on section 41 of the NERC Act.
- 7.4.28 Badger and hedgehog are of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.
- 7.4.29 Brown hare was recorded incidentally during other ecological surveys (bird and bat surveys) undertaken within the site, with two to three individuals noted at any one time. East Anglia holds approximately 20% of the national population across the three counties (Cambridgeshire, Suffolk and Norfolk) (Ref. 7.36). The Suffolk BAP for brown hare states that the species is widespread in Suffolk; however, recent reports in the east of England in 2018 suggest brown hare are suffering from a disease epidemic with records of sick or dead animals (Ref. 7.37), and with Rabbit Haemorrhagic Disease Type 2 now confirmed in brown hare from Dorset and Essex (Ref. 7.38). Brown hare within the ZOI is of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

#### b) Future baseline

- 7.4.30 There are no committed development(s) or forecasted changes (e.g. climate change) that would materially alter the baseline conditions during the construction, operation and removal and reinstatement phases of the proposed development.

#### c) Important Ecological Features

- 7.4.31 Following a review of the known baseline information within the ZOI, **Table 7.10** lists the ecological features/receptors and details which have

been carried forward into the detailed assessment. Further justification for these is also found within **Appendix 7A** of this volume. Those carried forward are IEFs of sufficient conservation value (local/Low importance or above) with a potential to be affected by the proposed development, and therefore requiring further consideration within this chapter.

- 7.4.32 There are several ecological features that, while not of significant nature conservation value within the ZOI, do require some consideration because of the legislative protection afforded to them. While not taken forward for detailed assessment, these have been considered further within **section 7.5** where appropriate mitigation to ensure legislative compliance for their protection has been described.

**Table 7.10: Determination of IEFs to be taken forward for detailed assessment.**

Feature/ Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
Non-statutory designated sites within 2km of the red line boundary.	County/Medium.	CWSs support a range of habitats types that are listed on Section 41 of the NERC Act, and which are targeted for action in the Suffolk BAP. Given the distance of these designated sites from the site (the closest of which is approximately 430m away), and the implementation of the primary and tertiary mitigation measures detailed in <b>section 7.5</b> , no direct or indirect impacts are anticipated on the non-statutory designated sites.  All seven CWSs (Catt’s Wood, Great Wood Glevering Hall, Lower Hacheston Meadow, The Oaks, Copperas Wood, Ashe Abby Decoy Pond, and River Deben) have therefore been scoped out of the detailed assessment.	Scoped out.
Hedgerows	Local/Very low.	Hedgerows are a habitat listed on Suffolk’s Priority Species and Habitats list. A short section of hedgerow (approximately 40m), qualifying as ‘important’ under the Hedgerows Regulations would be lost during the construction of the proposed development. Remaining hedgerows would be retained as part of the primary mitigation measures as detailed in <b>section 7.5</b> .  Hedgerows are widespread in Suffolk, and it is not considered that the loss of a small section of hedgerow qualifying as ‘important’ at this location would result in a significant effect. In addition, landscape planting described under primary mitigation in <b>section 7.5</b> would offset the loss of hedgerow.	Scoped out.
Pond	Local/Very low.	Ponds are a habitat listed on Suffolk’s Priority Species and Habitats list.  Pond 59 located within the site is to be retained, and a buffer of over 10m maintained between the pond, the construction works, and the proposed perimeter fence as part of the primary mitigation measures detailed in <b>section 7.5</b> . This pond was found to be dry at the time of the surveys, and therefore not likely to support great crested newt. Therefore, with the inclusion of the primary and tertiary mitigation measures detailed in <b>section 7.5</b> , it is considered that there would not be any significant effects on this receptor as a result of the proposed development.  Ponds are therefore scoped out of the detailed assessment.	Scoped out.
Arable fields.	Local/Very low.	Arable habitat is widespread in Suffolk, and generally of limited ecological value. In addition, no botanically rich margins were identified during surveys. This habitat type has therefore been scoped out of the detailed assessment.	Scoped out.

**NOT PROTECTIVELY MARKED**

Feature/ Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
Broadleaved woodland.	Local/Very low.	All identified woodland blocks are external to the site boundary and would be retained in their entirety. A buffer of 10m between any woodland, and the proposed perimeter fence would be maintained as part of the primary mitigation measures detailed in <b>section 7.5</b> . Therefore, it is considered that there would not be any significant effects on this receptor as a result of the proposed development. Broadleaved woodland has therefore been scoped out of the detailed assessment.	Scoped out.
Amphibians	Local/Very low.	No great crested newts were recorded within 500m of the site, and only small numbers of other amphibians (common frog, smooth and palmate newts) were found within ponds within the study area. These species are not included on Suffolk's Priority Species and Habitats list. Amphibians have therefore been scoped out of the detailed assessment.	Scoped out.
Reptile assemblage.	Local/Very low.	All four common, native reptile species (adder, common lizard, grass snake and slow-worm) are protected under Schedule 5 of the Wildlife and Countryside Act, and are on section 41 of the NERC Act, and included on Suffolk's Priority Species and Habitats list. While a limited amount of habitat with the potential to support reptiles would be lost, habitats within the site were largely sub-optimal for reptiles, and therefore it is not considered that any significant effects would occur on this receptor as a result of the proposed development. Tertiary mitigation measures have described in <b>section 7.5</b> in order to adequately protect this ecological receptor. The reptile assemblage is therefore scoped out of the detailed assessment.	Scoped out.
Breeding and wintering bird assemblage.	Local/Low.	The potential breeding and wintering bird assemblage identified within the site is representative of the habitats present, and the populations observed on-site are likely comparable to the populations within the wider area. The intensively managed arable habitat, and the breeding and wintering bird assemblage it supports, is widespread in Suffolk, and the arable habitat is not being managed specifically to benefit birds. It is therefore not considered that any significant effects would occur on this receptor as a result of the proposed development. Breeding and wintering birds are therefore scoped out of the detailed assessment. However, breeding birds are protected under the Wildlife and Countryside Act. As such, there may be the potential for impacts on breeding birds, should works be undertaken during the breeding bird period (end of February to end of August inclusive). Tertiary mitigation measures are described in <b>section 7.5</b> to protect this ecological receptor.	Scoped out.

**NOT PROTECTIVELY MARKED**

Feature/ Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
Bat assemblage.	County/Low.	<p>At least eight bat species have been recorded within the site or the relevant ZOI during the desk-study and surveys. Activity levels were largely low, with the exception of common and soprano pipistrelle, but included the presence of the nationally rare barbastelle, a species with a restricted distribution and receiving additional protection under Annex II of the Habitats Directive.</p> <p>While the habitats present are largely sub-optimal, a number of trees along the site boundary and within woodland blocks immediately adjacent, were identified as having the potential to support roosting bats.</p> <p>The degree of sensitivity bats display varies between species; however, it is recognised that all bat species can be negatively impacted by human disturbance. All bat species in the UK are protected under Annex IV of the Habitats Directive, transposed to English law under the Conservation of Habitats and Species Regulations. Additional relevant legislation includes the Wildlife and Countryside Act, and the NERC Act.</p> <p>The bat assemblage is therefore scoped in to the detailed assessment.</p>	IEF Scoped in.
Badger	Local/Very low.	<p>Badgers are protected under Schedule 6 of the Wildlife and Countryside Act and by the Protection of Badgers Act.</p> <p>No evidence of badgers was identified within the site; due to the distance of the nearest 'potential main' sett from the proposed works, it is not anticipated that there would be any significant effects on this receptor; however, tertiary mitigation measures to ensure no impacts occur are described in <b>section 7.5</b>.</p>	Scoped out.
Brown hares.	Local/Low.	<p>A population of two or three individuals were recorded on-site during surveys. While a limited number of brown hares are likely to be found within or adjacent to the site, there is sufficient adjacent habitat to support this species. The number of individuals within the site boundary of this highly mobile species is unlikely to be significant for the wider population, and have therefore been scoped out of the detailed assessment.</p> <p>The brown hare is listed on Suffolk's Priority Species and Habitats list and section 41 of the NERC Act. Details of tertiary mitigation measures that would be employed to safeguard brown hare are detailed in <b>section 7.5</b>.</p>	Scoped out.
Hedgehog	Local/Very low.	<p>The habitats within the site boundary are generally unsuitable for hedgehogs, and there were no records of hedgehogs during surveys. Hedgehog has therefore been scoped out of the detailed assessment. However, hedgehog is listed on Suffolk's Priority Species and Habitats list and listed on section 41 of the NERC Act. Details of tertiary mitigation measures that would be employed to safeguard hedgehogs are detailed in <b>section 7.5</b>.</p>	Scoped out.

7.4.33 In summary, the only IEFs taken forward for a detailed assessment within **section 7.6** is:

- IEF: Bat assemblage.

## 7.5 Environmental design and mitigation

7.5.1 As detailed in **Volume 1, Chapter 6** of the **ES**, a number of primary mitigation measures have been identified through the iterative EIA process, and have been incorporated into the design and construction planning of the proposed development. Tertiary mitigation measures are legal requirements, or are standard practices that will be implemented as part of the proposed development.

7.5.2 The assessment of likely significant effects of the proposed development assumes that primary and tertiary mitigation measures are in place. For terrestrial ecology and ornithology, these measures are identified later, with a summary provided on how the measures contribute to the mitigation and management of potentially significant environmental effects.

### a) Primary mitigation

7.5.3 Primary mitigation is often referred to as ‘embedded mitigation’ and includes modifications to the location or design to mitigate impacts, these measures become an inherent part of the proposed development.

7.5.4 A summary of the primary mitigation that has been incorporated into the design of the proposed development that would protect the existing habitats and species is provided:

- The operational park and ride facilities on-site would be bounded by a 1.8m high perimeter security fence. This security fence would prevent personnel using the proposed development from accessing the surrounding habitats. This would have the added benefit of reducing disturbance, habitat damage, and littering within the neighbouring woodland blocks such as Whin Belt and Wonder Grove.
- Landscape bunds 3m high would be located within the north-west, north-east, east and south-east boundaries of the site, to aid in the screening of the proposed development from the adjacent landscape and habitats features. This would also provide acoustic screening, as outlined in **Chapter 4** of this volume. The landscape bunds would be bounded by badger fencing which would prevent colonisation by this species and so minimise constraints during the removal and reinstatement phase.



**NOT PROTECTIVELY MARKED**

- There would be no dewatering as part of the proposed development. In addition, the design of the Sustainable Drainage System (SuDS) infrastructure would allow for surface water run-off to be returned to ground at green field rates, and so there would be no changes to the local hydrology regimes.
- Operational lighting would be designed so that light spill beyond the site boundary would be minimal (lighting levels would be less than between 1.0 lux), and there would be no substantive light spillage into adjacent habitats and woodland blocks including Whin Belt. The lighting design for the proposed development would use light fittings chosen to limit stray light. Guidance within the latest Institution of Lighting Professionals Guidance Note (Ref. 7.39) would be followed as far as possible. These measures would minimise impacts on nocturnal species such as bats that may use the nearby tree lines or habitats for roosts or foraging.
- Broadleaved woodland habitat:
  - Woodland blocks on the perimeter, including Whin Belt, would be retained in their entirety, and so there would therefore be no direct loss of this habitat and its associated species.
  - A buffer distance of 10m between the woodland, and the proposed perimeter fence would be maintained along sections of the boundary, namely along the southern, eastern and, where adjacent to woodland blocks, the western boundaries. With the exception of fencing, no above ground buildings or structures will be within this buffer zone. The **Outline Drainage Strategy**, provided in **Appendix 2A** of **Volume 2** of the **ES**, for the site includes the provision of SuDS infrastructure which would be implemented to minimise surface water run-off, and prevent diffuse pollution from sediment and other pollutants arising. This buffer would assist in minimising any indirect impacts (e.g. from noise, lighting and human disturbance) on those species using habitats adjacent to the site.
  - In addition to the measures previously, close-boarded fencing would be erected where the site boundary abuts woodland blocks to provide protection from vehicle headlights and noise. The close-boarded fencing would be maintained during operation and until reinstatement is complete to act as a screen for lighting and noise impacts.

- Hedgerow habitat:
  - All boundary hedgerows would be retained other than a short section of hedgerow, approximately 40m in length, which would be lost at the location of the access road.
  - Soft landscaping, including grassed areas, tree and shrub planting would be installed and maintained for the operation of the proposed development. There would also be temporary hedgerow planting along the access road, whilst the park and ride is operational, to replace hedgerows lost during construction, and would be replanted along the original hedgerow line during the removal and reinstatement phase. It is considered that landscape planting would offset the loss of hedgerow qualifying as ‘important’ under the Hedgerows Regulations required to accommodate the access road.
  - Permanent supplementary hedgerows would be planted along the southern and eastern boundaries of the site.
- Pond 59 located within the site, close to the western boundary, would be retained, and so there would be no direct loss of this habitat, and its associated species. This pond would be further protected by a buffer area of a minimum of 10m between the pond, where with the exception of fencing, no above ground buildings or structures will be within this buffer zone.

7.5.5 Further details of the primary mitigation measures taken into account within the design of the proposed development to minimise noise, dust pollution and air quality changes and to protect water quality are outlined in **Chapters 4, 5 and 12** of this volume respectively.

#### b) Tertiary mitigation

7.5.6 Tertiary mitigation would be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral best practices.

7.5.7 Tertiary mitigation relevant to terrestrial ecology and ornithology would be detailed in the **Construction Code of Practice (CoCP)** (Doc Ref. 8.11). The **CoCP** would be informed by relevant environmental legislative requirements as well as general requirements and compliance with current standards, construction and operational experience. The **CoCP** would establish the framework of arrangements required to manage environmental and ecological impacts, mitigate nuisance to the public and safeguard the environment during the enabling works, preliminary works, the main construction phase and site restoration phases.

7.5.8 Mitigation measures relevant to terrestrial ecology and ornithology that would be included in the **CoCP** (Doc Ref. 8.11) would comprise:

- Construction work would take place during Monday to Saturday 07:00–19:00 hours, and some lighting in winter may be required dependent upon what construction activities are taking place. Outside of these hours, lighting may be required at night for safety or security. Temporary construction lighting would be controlled to minimise light spill on surrounding habitats. This would minimise impacts on nocturnal species such as bats that may use the nearby tree lines, or habitats for commuting, roosts or foraging. The lighting design would use light fittings chosen to limit stray light, and minimise impacts on sensitive species. The lighting would also be designed to minimise the visibility from sensitive receptors off-site.

7.5.9 The proposed development includes the removal of several trees including three trees identified as having the potential to support roosting bats. Therefore, tree inspections to determine evidence of use as roosts would be undertaken sufficiently in advance of tree-felling to enable licence application(s) to be submitted to Natural England and develop an appropriate mitigation strategy, if required. Management measures would likely include:

- A final inspection of these trees would be undertaken as close to the timing of felling as possible to take into account the regular roost-switching behaviour displaced by tree-roosting bat species. Should bats (or evidence of use by bats) be identified, the mitigation strategies laid out in the licence application(s) would be implemented (for example, the fitting of exclusion devices).
- Felling of trees would generally be undertaken in September or October, to avoid both the maternity and hibernation periods during which bats are more vulnerable to disturbance (this timing also avoids the breeding bird season).
- To mitigate for the loss of the tree and potential roost resources, bat boxes would be installed on retained trees in suitable locations within the site boundary, prior to felling. One bat box would be installed per tree with medium or high bat roost potential that is due to be lost, whether or not a roost has been identified. A variety of bat boxes would be used to support different species.

7.5.10 A small proportion of habitat within the site, primarily around the field margins, was identified as having some limited potential to support a small population of reptiles. All reptile species are protected from killing or injury under the Wildlife and Countryside Act. Therefore the following measures would be undertaken prior to the commencement of construction:

**NOT PROTECTIVELY MARKED**

- An inspection would be undertaken by a suitably experienced ecologist of any potential reptile refugia, after which the reptiles would be removed.
- A phased vegetation clearance process would be undertaken to displace any reptiles from the site, under the supervision of a suitably experienced ecologist. Removal of vegetation and of places of shelter/hibernation features would be undertaken outside of the reptile hibernating period (October to February inclusive), during periods of warm, dry weather (with due consideration of the seasonal constraints of clearance works during breeding bird season). If this is not possible, vegetation would be cut to the ground (to remove potential bird nesting habitat), but the roots would remain intact until hibernation is complete. The root system of vegetation would then be removed once the reptile hibernation season is over. Clearing of vegetation would be undertaken under the supervision of the suitably experienced Ecological Clerk of Works (ECoW).

**7.5.11** Construction activities have the potential to risk killing or injuring breeding birds, and damage or destroy nests, including those of ground-nesting species, should works be undertaken during the breeding bird season (late February to August inclusive). Birds and their nests are protected under the Wildlife and Countryside Act, therefore removal of scrub and trees and ground clearance works would generally be undertaken outside of the breeding bird season. Measures could also be put in place to deter birds from nesting in any hedgerow to be removed (for example, cutting back vegetation and making the area less suitable); however, the ground would need to remain undisturbed during the reptile hibernation period. Where it is not possible to undertake these works outside of the breeding bird season, an inspection for nests would be undertaken by a suitably experienced ECoW prior to the removal of vegetation. If breeding birds are identified during this process, works in the vicinity of the nest (estimated to be a 10m standoff) would need to cease until the young have fledged.

**7.5.12** There is the potential for badgers entering the proposed development site during construction, and so the following measures would be undertaken during construction:

- Prior to construction works commencing, a pre-construction walkover of the site would be conducted to identify any newly established setts that may be impacted by the works. Should any new setts be identified that would be disturbed by the construction works, or would require closure, then a licence from Natural England would be obtained. All licensable works would be undertaken between July to November (inclusive).

- Any excavations made during construction activities would be closed at the end of the day to prevent access by badgers. Should it not be possible for excavations to be closed at night, a means of egress (i.e. a wooden plank or soil ramp) would be provided to ensure that any badgers that may access these excavations have a means of escape.
- 7.5.13 The phased approach to site clearance and topsoil stripping (as described previously to safeguard reptiles) would discourage brown hare and hedgehogs away from the site of activity and into the surrounding suitable habitat.
- 7.5.14 Further details of tertiary mitigation measures taken into account within the design of the proposed development to minimise noise and vibration impacts, dust pollution and air quality changes, and to protect water quality are outlined in **Chapters 4, 5 and 12** of this volume respectively.
- 7.5.15 Mitigation applied to the construction phase would be applied during the removal and reinstatement phase as effects are likely to be similar.
- 7.6 **Assessment**
- a) **Introduction**
- 7.6.1 This section presents the findings of the terrestrial ecology and ornithology assessment for the construction, operation and removal and reinstatement of the proposed development. It brings together the information presented in the preceding sections to consider the specific impacts likely to be experienced by the IEFs within the ZOI of the proposed development. Using the criteria set out within the CIEEM guidelines, the sensitivity of the IEFs, and all of the potential impacts related to each IEF have been characterised.
- 7.6.2 This section identifies any likely significant effects that are predicted to occur, and **section 7.7** then highlights any secondary mitigation, and monitoring measures that are proposed to minimise any adverse significant effects (if required).
- b) **Construction**
- i. **Important Ecological Feature: Bat assemblage**
- 7.6.3 During the construction phase of works, the main impact pathways to the bat assemblage would be associated with:
- land take (habitat loss);
  - incidental mortality of individuals; and

- disturbance effects (comprising light, noise and visual effects).

7.6.4 Of the construction impact pathways listed previously, incidental mortality of bats has been scoped out of this assessment. This is because although construction works would entail the movement of plant, and other vehicles around the site, traffic would be travelling at low speeds, and the likelihood of incidental mortality would be low. In addition, although some activities may require 24-hour working, the majority of construction would take place Monday to Saturday 07:00–19:00 hours. This means night-time works would be avoided when bats are most active.

7.6.5 Of the impact pathways taken forward within the assessment, the specific impact pathways that could be experienced by the IEF have been identified and detailed within the subsequent sections. In order to assess each impact pathway, the first four elements of the CIEEM assessment process are addressed here, namely:

- Proposed activity, duration of activity, biophysical change and relevance to IEF in terms of ecosystem structure and function.
- Characterisation of unmitigated impact on the feature (taking into consideration the embedded primary and tertiary mitigation, as detailed in **section 7.5**).
- Rationale for prediction of effect on integrity (of a site or ecosystem) or conservation status (of a habitat or population).
- Effect without further (i.e. secondary) mitigation.

7.6.6 The remaining elements of the CIEEM assessment process; mitigation and significance of effects of residual impacts after mitigation, are discussed in **sections 7.7** and **7.8** respectively.

#### Habitat loss

7.6.7 The design of the proposed development has sought to minimise the extent of habitat loss through the retention of the woodland blocks, and the retention of most of the hedgerows along the site boundary. Tertiary mitigation measures also ensure that ecological constraints, such as those that may be associated with the removal of trees with the potential to support roosting bats, are taken into consideration during the construction process.

7.6.8 The construction of the proposed development would result in the loss of arable land, a short section of hedgerow (approximately 40m), and three trees with the potential to support roosting bats (two high potential and one low potential). The loss of habitat would cause a reduction in foraging habitat

available to bats, and the loss of features suitable for bats to roost in. The loss of the hedgerow section would remove part of a linear feature suitable for use by commuting bats.

**7.6.9** The arable habitat to be temporarily lost would be approximately 18 hectares (ha) in area. This habitat, while sub-optimal, is used to a limited extent by foraging bats. The proportion of foraging habitat lost that the site represents is dependent on the home range used by a bat. This home range varies between species, and is dependent on a range of criteria, including the quality of habitats available. The concept of CSZ, as developed following an extensive literature review by the Bat Conservation Trust (Ref. 7.40), has been used to make this assessment, as detailed in **Table 7.11**.

**Table 7.11: Summary of the proportion of each bat species’ Core Sustainance Zone to be lost as a result of the proposed development.**

Species	CSZ (km).	Percentage Of CSZ To Be Lost Due To Proposed Development.
Common pipistrelle.	2km	1.43%
Soprano pipistrelle. Brown long-eared bat. Nathusius’ pipistrelle.	3km	0.64%
Noctule <i>Myotis</i> spp.	4km	0.36%
Barbastelle	10km	0.06%

**7.6.10** **Table 7.11** demonstrates that only a small proportion of each bat species’ CSZ would be affected due to this habitat loss (even in the absence of any consideration of quality), resulting in a very low or low magnitude of impact (species dependent). This is further supported because the habitats to be lost are not of significant value, and are unlikely to be an important component of any of the species’ CSZs.

**7.6.11** The habitats present within the site are largely sub-optimal for bats, being intensively managed for arable farming and primarily open in nature. The sub-optimal arable land has fewer invertebrates for foraging bats. During activity and static detector surveys, activity indicative of both foraging and commuting bats was recorded; however, activity levels, except for common and soprano pipistrelle, were consistently low over the open arable habitat, and records indicate that this activity is most likely to have been generated by a small number of individuals making multiple passes. Activity levels were marginally higher within and adjacent to the woodland, and the bat assemblage within the ZOI is therefore not considered to be reliant on arable habitats for foraging.

- 7.6.12 Survey work has not confirmed bat roosts in the vicinity of the site. The habitat surrounding the site, while dominated by arable habitat, contains several small to medium-sized woodland blocks, which are likely to provide multiple, alternative roost locations. The loss of three trees with roost potential would not impair the ability of the bat assemblage present to roost. Whilst individual bat species are considered to have a high sensitivity to the loss of roost sites, the three trees to be permanently lost were not found to have signs of current occupation by bats at the time of the assessment. However, tree-roosting bat species are known to switch roost on a regular basis (Ref. 7.41), and therefore the absence of signs of current occupation at the time of the assessment does not exclude the potential for these trees to be occupied in the future, at the time of felling.
- 7.6.13 The requirement of bats for linear features to forage or commute along varies between species, with the majority of species (noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and serotine) recorded within the proposed development site, and/or ZOI, being less reliant on linear features for commuting. Additionally, evidence for barbastelle reliance on linear features is mixed, with, for example, radio tracking surveys undertaken across the EDF Energy Estate<sup>4</sup> at Sizewell (Ref. 7.42) indicating the ability of barbastelle to commute, and forage in the absence of linear features. The short section of hedgerow to be lost is at a location that does not lend itself to be a commuting route, terminating at the busy and noisy A12, and with limited connecting linear features to the south. Bat activity recorded adjacent to this hedgerow during surveys was primarily located to the north of the proposed access road, adjacent to Whin Belt and consisted primarily of common and soprano pipistrelle foraging passes.
- 7.6.14 The degree of sensitivity bats display with regards to habitat loss varies between species; however, the surrounding landscape is dominated by similar arable habitat. It is therefore considered that any bats affected by the loss of this habitat would be able to use the large areas of similar arable habitat present within the ZOI. The bat assemblage within the ZOI would therefore have a low sensitivity to this impact.
- 7.6.15 The loss of land used for arable land, and hedgerow would be temporary (long-term) and reversible, with the site returned to arable use once the need for the facility has ceased, reinstating the land as a sub-optimal foraging resource for the bat assemblage.
- 7.6.16 Overall, the impact of habitat loss on the bat assemblage would be of low magnitude and would have a minor adverse effect which is **not significant**.

---

<sup>4</sup> Land owned by EDF Energy in the Sizewell area.



### Disturbance from noise

- 7.6.17 The construction of the proposed development may result in an increase in noise within the site and adjacent habitats. Noise disturbance may arise through construction activities (such as noise from machinery), increased vehicle movements and increased human presence on-site during construction (between 12–18 months). The number of vehicle movements during construction is described in **Chapter 2** of this volume.
- 7.6.18 Primary mitigation measures (detailed in **section 7.5**) include the presence of a 10m buffer between the woodlands, and the proposed perimeter fence, the presence of landscape bunds, security fencing and installation of close-boarded fencing where the proposed development abuts woodland. These measures would facilitate attenuation of noise to habitats associated with foraging, commuting and roosting bats.
- 7.6.19 Construction working hours would generally not overlap with periods when bats are active, so foraging and commuting bats would not be affected by construction noise. However, noise from construction activity could disturb roosting bats in adjacent areas of woodland (including Whin Belt and the broadleaved plantation to the north of Whin Belt) resulting in delayed emergence or roost abandonment.
- 7.6.20 Anecdotal evidence, such as the use of Wolvercote Railway Tunnel by roosting bats (Ref. 7.43) despite the presence of a live railway, suggests that in certain circumstances bats can become habituated to noise, although the degree to which this may occur is likely to be species-specific. However, the occupation of a site with increased noise levels does not indicate an absence of impact, as increased noise levels can result in a delay in roost emergence time (Ref. 7.44), which may result in the period of peak invertebrate activity (at or soon after dusk; Ref. 7.45) being missed, reducing the level of foraging a bat can undertake.
- 7.6.21 Noise associated with human activity during construction may be more detrimental than mechanical and vehicle noise, as such noise is more likely to be assessed by bats as potential predation (Ref. 7.46). This is also likely to be species-dependent with pipistrelle and long-eared bat species often found roosting, and foraging in close proximity to human activity (relative to other species) while, other species including barbastelle appear to avoid areas with intense human activity.
- 7.6.22 Should bats be displaced by construction activities (in addition to displacement through habitat loss), there are (as for habitat loss) other areas of woodland in the wider countryside that would provide suitable, alternative roosting and foraging habitat, and activity levels demonstrate that bat species

are not wholly reliant on the habitats within the site, and its ZOI. It is therefore considered that bats would be able to use the large areas of more suitable habitat present within the wider ZOI.

7.6.23 In addition, only a relatively small number of bats have been recorded within the site on any one occasion, with a high of 20 passes<sup>5</sup>, and a maximum of five species recorded during any single transect survey. The bat assemblage, of low sensitivity, within the ZOI is therefore not considered to be reliant on this on-site habitat, and would also be using a range of additional habitats in the ZOI.

7.6.24 The extent of noise from the construction of the proposed development is likely to be restricted to the footprint of the facility, and habitats on the immediate boundary, resulting in a low magnitude of impact which would be temporary, medium-term (relating to the 12–18 month construction period) and reversible. This would result in a minor adverse effect which is **not significant**.

#### Disturbance from light

7.6.25 Construction lighting would increase light levels and could cause light intrusion into nearby habitats. As described in **section 7.5** under tertiary mitigation, the site would be lit for safety purposes, or for specific works/operations. The lighting design would minimise light spill (levels would largely not exceed 0.1lux at the site boundary, with lighting levels between 1.0 and 0.1lux in only several locations), and the potential for light disturbance on adjacent land. Primary mitigation also includes buffers between the proposed perimeter fence and adjacent areas of woodland, and the installation of close-boarded fencing where the site abuts woodland.

7.6.26 Bat species are known to be sensitive to the effects of light, but this does vary with the type of lighting and species of bat being considered. An increase in light levels and light spillage could cause:

- Disturbance to roosting bats in adjacent areas of woodland including delayed emergence, or roost abandonment (Ref. 7.47).
- Impacts to foraging and commuting bats, due to aversion to lit areas or effects on prey behaviour and availability.

7.6.27 The type of lighting has also been shown to impact the degree to which bats are affected by artificial lighting (Ref. 7.39, Ref. 7.48). Invertebrate species are highly attracted to Ultra-Violet, green and blue light (light with short

<sup>5</sup> Note that this is likely to indicate fewer than 20 individuals as the number of passes does not equate to a specific number of individuals.

wavelengths and high frequencies) which can result in increased insect numbers around artificial light sources. Some bat species (including noctule, serotine and pipistrelle species) have been shown to capitalise on this, foraging around artificial light sources. However, several bat species, including barbastelle, *Myotis* spp. and long-eared bats, recorded within the site, generally avoid lit areas, and are therefore more sensitive to an increase in light levels. Artificial light is further thought to attract insects into lit areas from further afield, with the potential for this to reduce the levels of insect prey available within adjacent habitats.

**7.6.28** While it is clear that lighting can impact bats, only a relatively small number of bats have been recorded within the site on any one occasion. In addition, for the reason cited in previously, the bat assemblage in this location is likely to have a low sensitivity to increases in light levels. The area over which an increase in lighting is likely to occur would be limited to the site. Given the primary and tertiary mitigation measures in place, there would be no substantive light spillage into adjacent woodland blocks including Whin Belt. This would result in a low magnitude of impact, and would be medium-term, relating to specific requirements for lighting during the 12–18 month construction period. This would result in a minor adverse effect which is **not significant**.

#### ii. Inter-relationship effects

**7.6.29** The potential construction impacts of noise, lighting, air, water on IEFs are inherently considered within the assessment, and therefore no inter-relationship with other topics are considered further.

**7.6.30** This section provides a description of the identified inter-relationship effects that are anticipated to occur on terrestrial ecology and ornithology receptors between the individual environmental effects arising from construction of the proposed development.

**7.6.31** The potential impacts on the bat assemblage have been assessed as being minor adverse and **not significant**, and in combination would not be expected to have a significant effect.

#### c) Operation

##### i. Important Ecological Feature: Bat assemblage

**7.6.32** During the operational phase, the main impact pathways on the bat assemblage would be associated with:

- disturbance from noise; and

- disturbance from light.

7.6.33 Incidental mortality of bats has been scoped out of this assessment. This is because although operational of the proposed development would entail the movement of vehicles around the site, traffic would be travelling at reduced speeds and the likelihood of incidental mortality would be low. It is therefore considered that this would not have a significant effect on the bat assemblage.

7.6.34 The characterisation of the impacts of the above activities have been described in detail in the subsequent sections.

#### Disturbance from noise

7.6.35 The operation of the proposed development would lead to an increase in noise levels from both traffic and people compared to the baseline. The proposed development would be operational seven days a week with arrivals, and departures planned to accommodate the shift patterns adopted during the construction phase of the Sizewell C main development site. During shift changeovers, a frequent service would be run, with a reduced, skeleton, service operational outside of these periods. It is not anticipated that arrivals or departures would occur between the hours of 01:00 and 05:00. For most of the bats' active season (April to October), these hours represent the period when bats are less active. However, activity levels during this period would increase during the height of Summer when the overall length of night-time hours is reduced.

7.6.36 It is anticipated that operational noise levels would be mostly lower than those associated with construction, see **Chapter 4** of this volume. As outlined in **section 7.5**, primary mitigation measures (including landscape bunds, security and close-boarded fencing) would reduce the effect of noise levels on adjacent habitats and their associated species as far as practicable.

7.6.37 As noted previously in the construction assessment, although bats can be impacted by noise, the level of bat activity recorded within the site was low, and the habitats present largely sub-optimal. The bat assemblage, of low sensitivity, within the ZOI is therefore not reliant on this habitat for foraging.

7.6.38 The extent of noise from the operation of the proposed development is likely to be restricted to the site and habitats on the immediate boundary, resulting in a very low magnitude of impact. The impact would be temporary but long-term (as operation is expected to last between 9–12 years), and reversible over time, once the operational phase is complete. This would result in minor adverse effect which is **not significant**.

### Disturbance from light

- 7.6.39 The operation of the proposed development would result in an increase in light intrusion due to the operational lighting required. Lighting would be provided in accordance with the indicative lighting plan for the site. The lighting along the access point from the slip road would be designed in accordance with highway standards and along the access road. Light fixtures would be mounted at 6m height within the parking area and access road and 10m along the slip road, and consist largely of LED lights. Primary embedded mitigation (for example, use of light fittings chosen to limit stray light, see **section 7.5**) would reduce the spillage of light from the operational lighting within the park and ride facility into adjacent areas of habitat as far as possible. However, there could potentially also be impacts of light spillage into neighbouring woodland from the headlights of vehicles using the proposed development.
- 7.6.40 The operational lighting would be in place for the operational period of the proposed development, approximately a 9–12 year period. During operation, lighting would be provided which would be operational at night when bats are active. The area over which an increase in fixed lighting would occur would be limited to the site. Given the primary and tertiary mitigation measures in place, the light spill beyond the site boundary would be minimal (levels would largely not exceed 0.1 lux at the site boundary, with lighting levels between 1.0 and 0.1lux in only several locations), and there would be no light spillage from fixed lighting into adjacent woodland blocks including Whin Belt. However, these calculations do not consider the headlights of vehicles using the proposed development.
- 7.6.41 Lighting can affect bats in number of ways, and some bat species are regarded as highly sensitive to light disturbance. The increase in lighting compared to pre-construction light levels, would be restricted to the proposed development and adjacent habitats.
- 7.6.42 While lighting can act as a deterrent to bats, only a relatively small number of bats have been recorded within the site. Bats using the site are clearly not dependent on the habitat present within the site, and would also be using a range of additional habitats in the ZOI. The bat assemblage, of low sensitivity, within the ZOI is therefore not considered to be reliant on this on-site habitat for foraging.
- 7.6.43 Overall, fixed lighting would have a very low magnitude of impact on the bat assemblage, resulting in a negligible adverse effect which is **not significant**. Vehicle lights would have a low magnitude of impact on the bat assemblage, resulting in a minor adverse effect which is **not significant** at the local level. These effects would be temporary, but long-term (operation is expected to

last 9–12 years) and reversible over time, once the operational phase is complete and the site is restored to its existing use.

ii. **Inter-relationship effects**

7.6.44 The potential operation impacts of noise, lighting, air, water on IEFs are inherently considered within the assessment, and therefore no inter-relationship with other topics are considered further.

7.6.45 This section provides a description of the identified inter-relationship effects that are anticipated to occur on terrestrial ecology and ornithology IEFs between the individual environmental effects arising from operation of the proposed development.

7.6.46 The potential impacts on the bat assemblage have been assessed previously as being negligible, or minor adverse, and **not significant**, and in combination, these impacts would not be expected to have a significant effect.

d) **Removal and reinstatement**

7.6.47 During removal and reinstatement, the potential impacts experienced by IEFs would be similar to those of construction. With the exception of habitat loss, the potential impact pathways scoped in are the same as those considered in the assessment of construction effects.

7.6.48 The specific impact pathways that could be experienced by each IEF have been identified and detailed within the subsequent sections.

i. **Important Ecological Feature: Bat assemblage**

7.6.49 During the removal and reinstatement phase, the area would be returned to agricultural use. Temporary planting within the site would be removed and hedgerows would be reinstated along the original hedgerow lines where practicable (i.e. to baseline conditions).

7.6.50 The main impacts on the bat assemblage would be the same type, magnitude and significance as those described for construction, with the exception of habitat loss, and would result in minor adverse effects, which are considered to be **not significant**.

7.6.51 As the site would be returned to agricultural use, and all hardstanding removed, this would have a permanent, neutral effect which is **not significant**.

## ii. Inter-relationship effect

7.6.52 The potential impacts from the removal and reinstatement phase of noise, lighting, air, water on IEFs are inherently considered within the assessment and therefore no inter-relationships with other topics are considered further.

7.6.53 This section provides a description of the identified inter-relationship effects that are anticipated to occur on terrestrial ecology and ornithology IEFs between the individual environmental effects arising from removal and reinstatement of the proposed development.

7.6.54 The potential impacts on the bat assemblage have been assessed previously as being negligible or minor adverse, and **not significant** (as during construction), and in combination, these impacts would not be expected to have a significant effect.

## 7.7 Mitigation and monitoring

### a) Introduction

7.7.1 Primary and tertiary mitigation measures which have been incorporated within the design of the proposed development and considered during the assessment are summarised in **section 7.5**. As the assessment concluded no significant effects when considering the primary and tertiary mitigation measures, no further mitigation measures for the terrestrial ecology and ornithology assessment are required to reduce or avoid a significant effect.

### b) Monitoring

7.7.2 This section describes any monitoring required of specific receptors/resources or for the effectiveness of a mitigation measure. The requirements, scope, frequency and duration of a given monitoring regime are set out, as far as possible.

## i. Construction

7.7.3 All vegetation clearance would be conducted under the supervision of a suitably experienced ECoW, who would monitor for breeding bird, reptile, and small mammal constraints. The ECoW would also oversee all ground-breaking activities and inspect all excavations daily.

7.7.4 During construction, there would be regular checks of the security fence, badger fence and close-boarded fence to check these remain intact, and that there is no encroachment of construction activities beyond the site boundary or within the buffer areas. This would also include checks that badgers remain excluded from the site, and the landscape bunds. Should badgers

gain access to and create setts within the site, a licence from Natural England would be obtained to close these setts.

- 7.7.5 There would be regular checks of construction lighting to monitor and correct for any extraneous light spill into surrounding habitats.

ii. **Operation**

- 7.7.6 Bat boxes would be monitored post-construction to confirm the presence/absence of bats and use of the bat boxes. If bat boxes have not been occupied by year 5 following installation, consideration would be given to moving them to alternative sites nearby, to be determined by a licensed bat ecologist.

- 7.7.7 There would also be regular checks of operational lighting to monitor and correct for any extraneous light spill into surrounding habitats.

- 7.7.8 Throughout the operational phase, regular monitoring of the security fence, ecological fence and close-boarded fence would be conducted to ensure that this remains intact. This would also include checks that badgers remain excluded from the site and the landscape bunds. Should badgers gain access to and create setts within the site, a licence from Natural England would be obtained to close these setts.

iii. **Removal and reinstatement**

- 7.7.9 Monitoring during removal and reinstatement would be similar to that described for construction.



## 7.8 Residual effects

7.8.1 The following tables (**Table 7.12**, **Table 7.13** and **Table 7.14**) present a summary of the terrestrial ecology and ornithology assessment. They identify the receptor/s likely to be impacted, the level of effect and, where the effect is deemed to be significant, the tables include the mitigation proposed and the resulting residual effect.

7.8.2 Overall, no significant residual effects have been identified.

**Table 7.12: Terrestrial ecology and ornithology summary of effects arising during construction of the proposed development.**

Receptor	Impact	Primary Or Tertiary Mitigation.	Classification Of Effect.	Additional Mitigation.	Residual Effect.
Bat assemblage.	Loss of arable habitat. Loss of three potential roost trees and short section of hedgerow.	<ul style="list-style-type: none"> <li>Perimeter woodland retained.</li> <li>Majority of on-site hedgerows retained.</li> <li>Removal of trees with bat roost potential under licence from Natural England (if roosting bats confirmed during pre-construction checks).</li> <li>Bat boxes to mitigate for the loss of the trees and potential tree resource.</li> </ul>	Minor adverse.	No additional mitigation required. Regular checks of close-board fencing and construction lighting.	Minor adverse ( <b>not significant</b> ).
	Disturbance from noise.	<ul style="list-style-type: none"> <li>10m buffer between woodland and construction activity.</li> <li>3m high landscape bund on boundaries.</li> <li>Close-boarded fencing where the proposed development site abuts areas of woodland.</li> </ul>	Minor adverse.		Minor adverse ( <b>not significant</b> ).
	Disturbance from light.	<ul style="list-style-type: none"> <li>10m buffer between woodland and construction activity.</li> <li>3m high landscape bund.</li> <li>Control of temporary lighting to minimise light spill.</li> <li>Close-boarded fencing where the proposed development site abuts areas of woodland.</li> </ul>	Minor adverse.		Minor adverse ( <b>not significant</b> ).

**Table 7.13: Terrestrial ecology and ornithology summary of effects arising during operation of the proposed development.**

Receptor	Impact	Primary Or Tertiary Mitigation.	Classification Of Effect.	Additional Mitigation.	Residual Effect.
Bat assemblage.	Disturbance from noise.	<ul style="list-style-type: none"> <li>• 10m buffer between woodland and the operational facility.</li> <li>• 3m high landscape bund.</li> <li>• Close-boarded fencing where the proposed development site abuts areas of woodland.</li> </ul>	Minor adverse.	No additional mitigation required. Regular checks of close-board fencing and operational lighting.	Minor adverse ( <b>not significant</b> ).
	Disturbance from light.	<ul style="list-style-type: none"> <li>• 10m buffer between woodland and the operational facility.</li> <li>• 3m high landscape bund.</li> <li>• Close-boarded fencing where the proposed development site abuts areas of woodland.</li> <li>• Operational lighting levels would result in light levels beyond red line boundary not exceeding 0.1 lux with no light spill into Whin Belt (excluding vehicle headlights).</li> </ul>	Negligible, adverse – fixed lighting. Minor adverse – vehicles.	Monitoring of any installed bat boxes (if required).	Negligible, adverse ( <b>not significant</b> ) – fixed lighting. Minor adverse ( <b>not significant</b> ) – vehicles.

**Table 7.14: Terrestrial ecology and ornithology summary of effects arising during removal and reinstatement of the proposed development.**

Receptor	Impact	Primary Or Tertiary Mitigation.	Classification Of Effect.	Additional Mitigation.	Residual Effect.
Bat assemblage.	Habitat loss.	All hard standing would be removed, and the land returned to agricultural use.	Neutral.	No additional mitigation required. Monitoring inline construction.	Neutral ( <b>not significant</b> ).
	Disturbance from noise.	<ul style="list-style-type: none"> <li>• 10m buffer between woodland and construction.</li> <li>• 3m high landscape bund on boundaries.</li> <li>• Close-boarded fencing where the proposed development site abuts areas of woodland.</li> </ul>	Minor adverse.		Minor adverse ( <b>not significant</b> ).
	Disturbance from light.	<ul style="list-style-type: none"> <li>• 10m buffer between woodland and construction.</li> <li>• 3m high landscape bund on boundaries.</li> <li>• Control of temporary lighting to minimise light spill.</li> <li>• Close-boarded fencing where the proposed development site abuts areas of woodland.</li> </ul>	Minor adverse.		Minor adverse ( <b>not significant</b> ).

## References

- 7.1 United Nations. 1992. Convention of Biological Diversity.
- 7.2 UNESCO. 1971. The Convention on Wetlands of International Importance (Ramsar Convention).
- 7.3 European Parliament and of the Council. Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Bird Directive). Official Journal of the European Union. 2009.
- 7.4 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive). Official Journal of the European Communities. 1992.
- 7.5 European Council. 1979. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).
- 7.6 United Nations Environment Programme. 1979. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).
- 7.7 Wildlife and Countryside Act, as amended. 1981. (Online) Available from <http://www.legislation.gov.uk/ukpga/1981/69> (Accessed 1 March 2019).
- 7.8 Statutory Instruments 2017 No. 1012. The Conservation of Habitats and Species Regulations 2017.
- 7.9 Countryside and Rights of Way Act. 2000. (Online) Available from <http://www.legislation.gov.uk/ukpga/2000/37/contents> (Accessed 1 March 2019).
- 7.10 Natural Environment and Rural Communities Act. 2006. (Online). Available from: <http://www.legislation.gov.uk/ukpga/2006/16/contents> (Accessed 1 March 2019).
- 7.11 The Hedgerows Regulations. 1997. (Online) Available from: <http://www.legislation.gov.uk/uksi/1997/1160/contents/made> (Accessed 18 February 2019).
- 7.12 Protection of Badgers Act. 1992. (Online) Available from: <http://www.legislation.gov.uk/ukpga/1992/51/contents> (Accessed 1 March 2019).
- 7.13 UK Biodiversity Action Plan. 1994.
- 7.14 JNCC and Defra. 2012. UK Post-2010 Biodiversity Framework.
- 7.15 Ministry of Housing, Communities & Local Government. Planning Practice Guidance. The National Planning Policy Framework and relevant planning guidance. 22 October 2018. (Online). Available from:

- <https://www.gov.uk/government/collections/planning-practice-guidance>  
(Accessed 7 February 2019).
- 7.16 HM Government. A Green Future: Our 25 Year Plan to Improvement the Environment. 2018.
- 7.17 Department for Communities and Local Government. 2018. National Planning Policy Framework. February 2019.
- 7.18 National Policy Statements for energy infrastructure: National Policy Statement for Energy (EN-1) and National Policy Statement for Nuclear Power Generation (EN-6). July 2011. Available from: <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure> (Accessed 7 February 2019).
- 7.19 Suffolk County Council. 2015. Suffolk's Nature Strategy.
- 7.20 Suffolk Biodiversity Partnership. Suffolk Local Biodiversity Action Plan. May 2012. (Online). Available from: [https://www.suffolkbis.org.uk/sites/default/files/biodiversity/priorityspecieshabitats/actionplans/Planning\\_BAP\\_Final%2018%20May%202012.pdf](https://www.suffolkbis.org.uk/sites/default/files/biodiversity/priorityspecieshabitats/actionplans/Planning_BAP_Final%2018%20May%202012.pdf) (Accessed 7 February 2019).
- 7.21 Suffolk Biodiversity Information Service. Priority Species and Habitats. 2015 (Online) Available from: <https://www.suffolkbis.org.uk/biodiversity/speciesandhabitats> (Accessed 1 February 2019).
- 7.22 Suffolk Coastal District. 2013. Suffolk Coastal District Local Plan. Core Strategy and Development Management Policies.
- 7.23 East Suffolk. Suffolk Coastal and Waveney Councils. Suffolk Coastal Local Plan (in Draft). January 2019. (Online). Available from: <https://www.eastsuffolk.gov.uk/planning/local-plans/suffolk-coastal-local-plan/local-plan-review/final-draft-local-plan/> (Accessed 7 February 2019).
- 7.24 Chartered Institute of Ecology and Environmental Management. 2018. Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. Terrestrial, Freshwater, Coastal and Marine. Winchester: CIEEM.
- 7.25 JNCC. 2010. Handbook for Phase 1 habitat survey: a technique for environmental audit. JNCC.
- 7.26 G. Gilbert, D.W. Gibbons, & J. Evans. 1998. Bird Monitoring Methods. RSPB: Sandy.
- 7.27 M. A. Eaton, et al. 2015. Birds of Conservation Concern 4: Population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds, 2015, 94:452-504.

**NOT PROTECTIVELY MARKED**

- 7.28 Bratton, J.H. 1991. British red data books: part 3: invertebrates other than insects. Peterborough: JNCC.
- 7.29 Natural England. 2011. Natural England Technical Information Note TIN102: Reptile Mitigation Guidelines. Natural England.
- 7.30 English Nature. 2001. Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.
- 7.31 R.S. Oldham, J. Keeble, M.J.S. Swan & M. Jeffcote. 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal, 10(4), 143–155.
- 7.32 Natural England. 2015. Standing advice for local planning authorities who need to assess the impacts of development on badgers. Natural England, (Online) Available from: <https://www.gov.uk/guidance/badgers-surveys-and-mitigation-for-development-projects> (Accessed 7 February 2019).
- 7.33 L. Hundt. 2012. Bat Surveys: Good Practice Guidelines, 2nd edition. Bat Conservation Trust.
- 7.34 Natural England. Ancient Woodlands (England) Inventory. MAGIC, 2019. (Online) Available from: <https://data.gov.uk/dataset/9461f463-c363-4309-ae77-fdcd7e9df7d3/ancient-woodlands-england>.
- 7.35 P. Morris. European Hedgehog. In: UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. Editors: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trehwella, W.J., Wells, D. & Wray, S. Mammal Society, Southampton, 2012.
- 7.36 P. Wheeler, S. Wray & D. Yalden. 2012. Brown Hare and Mountain Hare. In: UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. Editors: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trehwella, W.J., Wells, D. & Wray, S. Mammal Society, Southampton.
- 7.37 Norfolk Wildlife Trust. Wildlife Trusts join with University of East Anglia to identify cause of hare deaths. Article dated 11 October 2018. (Online) Available from: <https://www.norfolkwildlifetrust.org.uk/news-and-articles/news/all-news/2018-10-11-wildlife-trusts-join-with-univ> (Accessed 23 February 2019).
- 7.38 The Guardian. Deadly rabbit virus threatens UK brown hare population. (Online) Available from: <https://www.theguardian.com/environment/2019/jan/25/deadly-rabbit-virus-threatens-uk-brown-hare-population> (Accessed 26 February 2019).
- 7.39 Institution of Lighting Professionals. 2018. Bats and artificial lighting in the UK. Guidance Note 08/2018. ILP/BCT.

- 7.40 J. Collins (ed.). 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. London: The Bat Conservation Trust.
- 7.41 D. Russo. L. Cistrone. G.Jones and S. Mazzoleni. Roost selection by barbastelle bats (*Barbastella barbastellus*) in beech woodlands of central Italy: Consequences for conservation. Biological Conservation, 2004, 117. 73–81.
- 7.42 Corylus Ecology. Sizewell Radio-tracking. 2016. Unpublished report to EDF on behalf of Arcadis.
- 7.43 Greena Ecological Consultancy. Wolvercote Railway Tunnel. Date Unknown. (Online) Available from: [http://www.bats.org.uk/data/files/Wolvercote\\_Tunnel\\_Geoff\\_Billington.pdf](http://www.bats.org.uk/data/files/Wolvercote_Tunnel_Geoff_Billington.pdf) (Accessed 19 September 2016).
- 7.44 M. D. F.Shirley, V. L. Armitage, T.L. Barden, M. Gough, P.W.W. Lurz, D.E. Oatway, A.B. South, & S. P. Rushton. 2001. Assessing the impact of a music festival on the emergence behaviour of a breeding colony of Daubenton's bats *Myotis daubentonii*. Journal of Zoology (London), 2001, 254(3): 367-373.
- 7.45 Bat Conservation Trust. 2008. Bat and Lighting in the UK. Bats and the Built Environment Series. Bat Conservation Trust.
- 7.46 J.R. Barber, K.R. Crooks, & K.M. Fristrup K.M. 2009. The costs of chronic noise exposure for terrestrial organisms. Trends Ecol Evol., 2009, 25:180–189.
- 7.47 E.L., Stone, G. Jones & S. Harris. 2009. Street Lighting Disturbs Commuting Bats, Current Biology, doi:10.1016/j.cub.2009.05.058 Available from: <http://www.sciencedirect.com/science/article/pii/S0960982209011932>.
- 7.48 Bat Conservation Trust. 2014. Artificial Lighting and Wildlife Interim Guidance: Recommendations to help minimise the impact of artificial lighting.