



The Sizewell C Project

6.4 Volume 3 Northern 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.....	1
7.3	Methodology.....	9
7.4	Baseline environment.....	25
7.5	Environmental design and mitigation.....	39
7.6	Assessment.....	45
7.7	Mitigation and monitoring.....	62
7.8	Residual effects.....	63
	References	68

Tables

Table 7.1:	Requirements of the National Policy for Energy.	4
Table 7.2:	Requirements of the National Policy Statement for Nuclear Power Generation. ..	5
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 zones of influence, study areas and survey areas for ecological features.....	17
Table 7.5:	Environmental Impact Assessment criteria for the assessment of ecological value/sensitivity.....	19
Table 7.6:	Assessment of magnitude of impact for terrestrial ecology and ornithology.	20
Table 7.7:	Criteria for determining the impact on ecological features under Chartered Institute of Ecology and Environmental Management guidelines (Ref. 7.25).....	21
Table 7.8:	Generic effect definitions.	22
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.	23
Table 7.10:	Determination of Important Ecological Features to be taken forward for detailed assessment.	34
Table 7.11:	Approximate area of great crested newt habitat that would be lost.....	49
Table 7.12:	Summary of the proportion of each bat species' Core Sustenance Zone to be lost as a result of the proposed development.	52

Table 7.13: Terrestrial ecology and ornithology summary of effects arising during construction of the proposed development.....	64
Table 7.14: Terrestrial ecology and ornithology summary of effects arising during operation of the proposed development.....	66
Table 7.15: Terrestrial ecology and ornithology summary of effects arising during removal and reinstatement of the proposed development.	66

Figures

All figures are found within **Annex 7A.1 of Appendix 7A: Ecological Baseline for the Northern Park and Ride at Darsham.**

Figure 7.1: Location of statutory designated sites within 5km of the northern park and ride at Darsham

Figure 7.2: Location of non-statutory designated sites within 2km of the northern park and ride at Darsham

Figure 7.3: Phase 1 habitat of the northern park and ride at Darsham

Figure 7.4: Northern park and ride at Darsham great crested newt surveys

Figure 7.5: Red list and NERC species recorded at northern park and ride at Darsham during breeding bird surveys in April-June 2015

Figure 7.6: Schedule 1 species recorded at northern park and ride at Darsham during winter bird surveys in November 2015 to January 2016

Figure 7.7: Red list and NERC species recorded at northern park and ride at Darsham during winter bird surveys from November 2014 to March 2015

Figure 7.8: Northern park and ride at Darsham Bat Tree Assessment Results 2015

Figure 7.9: Northern park and ride at Darsham Bat Surveyor Positions and SM2 Locations

Plates

None provided.

Appendices

Appendix 7A: Northern Park and Ride at Darsham Ecological Baseline

7. Terrestrial Ecology and Ornithology

7.1 Introduction

7.1.1 This chapter of **Volume 3** of the **Environmental Statement (ES)** presents an assessment of the terrestrial ecology and ornithology effects arising from the construction, operation and removal and reinstatement of the northern park and ride at Darsham (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 northern park and ride at Darsham site (referred to throughout this volume as the 'site'), the proposed development and the different phases of the proposed 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 **Volume 1, Appendix 1A** 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; and
- **Chapter 12:** Ground water and surface water, of this volume.

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

- **Appendix 7A:** Ecological baseline for the northern park and ride at Darsham.

7.2 Legislation, policy and guidance

7.2.1 **Volume 1, Appendix 6J** (Doc Ref. 6.2) 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 assessment of the proposed development.

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); and
- 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 **Volume 1, Appendix 6J**.

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 Regulations Guidelines (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 (NPPF) (Ref. 7.17); and
- Overarching National Policy Statement (NPS) for Energy (NPS EN-1) and (NPS EN-6) (Ref. 7.18).

7.2.6 The requirements of these, as relevant to the Terrestrial Ecology and Ornithology Assessment, are set out in **Volume 1, Appendix 6J**.

7.2.7 The NPS EN-1 and the NPS for Nuclear Power Generation (NPS EN-6) 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 **Volume 1, Appendix 6J**, with requirements specific to this site set out in **Table 7.1** and **Table 7.2**.

Table 7.1: Requirements of the National Policy 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 Shadow HRA Report for the Sizewell C Project (Doc Ref. 5.10).</p> <p>The Shadow HRA Report considers the possible pathways whereby the proposed development 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 application of the tertiary mitigation measures which would suitably protect neighbouring habitats. See Chapter 5 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>
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 section 7.4 of this chapter. These have been scoped out of the assessment in Table 7.10 due to the distance from the proposed development, and the implementation of the primary and tertiary mitigation described in section</p>

Ref.	NPS Topic Requirement.	How The Requirement Has Been Addressed In Relation To Terrestrial Ecology And Ornithology.
		7.5 of this chapter.
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"> <i>• during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;</i> <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; and</i> <i>• habitats will, where practicable, be restored after construction works have finished; and opportunities will be taken to enhance existing habitats, and where practicable, to create new habitats of value within the site landscaping proposals.”</i> 	<p>Primary and tertiary mitigation is defined within section 7.5 of this chapter.</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.
EN-6 1.7.4.	<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 (AoS). 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>A HRA Screening Assessment is included in the Shadow HRA Report for the Sizewell C Project (Doc Ref. 5.10).</p> <p>The Shadow HRA Report 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 ES, the methodology to determine the ecological baseline and baseline for terrestrial ecology and ornithology is detailed within sections 7.3 and 7.4 of this chapter and Appendix 7A of this volume. Section 7.4</p>

Ref.	NPS Topic Requirement.	How The Requirement Has Been Addressed In Relation To Terrestrial Ecology And Ornithology.
EN-6 Annex A A.7.4.	<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>	of this chapter also identifies the Important Ecological Features (IEFs), for which the impacts have been assessed within section 7.6 of this chapter.
EN-6 Annex C C.8.54.	<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>	
EN-6 Annex C C.8.53.	<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, 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>	An assessment of statutory designated sites within 5 kilometres (km) of the site is provided in section 7.4 of this chapter. This included Minsmere to Walberswick Heaths and Marshes SAC, SPA, Ramsar site and Site of Special Scientific Interest (SSSI), Sizewell Marshes SSSI and Leiston-Aldeburgh SSSI. No direct or indirect impact pathways have been identified, therefore there would be no significant effects on these designated sites.
EN-6 Annex C C.8.60.	<i>“Some responses focused on designated sites including Sizewell Marshes Site of Special Scientific Interest (SSSI), and Leiston-Aldeburgh SSSI, and potential effects on Minsmere-Walberswick Heaths and Marshes SSSI, from which the site boundary includes some land take. Some responses questioned how direct land take could be mitigated”</i>	All designated sites have been scoped out due to their distance from the site boundary and the lack of direct and indirect impact pathways. This has been described within Table 7.10 .
EN-6 Annex C C.8.61.	<i>“The AoS identified the potential for adverse effects on sites, and species considered to be of national nature conservation importance means that significant strategic effects on biodiversity cannot be ruled out at this stage of the appraisal. The AoS identifies that there could be potential significant effects at the following SSSIs which are within 5km of the site: Sizewell Marshes SSSI;</i>	

Ref.	NPS Topic Requirement.	How The Requirement Has Been Addressed In Relation To Terrestrial Ecology And Ornithology.
	<i>Minsmere-Walberswick Heaths and Marshes SSSI; Leiston-Aldeburgh SSSI; Alde-Ore Estuary SSSI."</i>	

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 **Volume 1, Appendix 6J** of the **ES**.

d) Local

7.2.10 Local policies relating to the Terrestrial Ecology and Ornithology Assessment include:

- Suffolk Coastal District Council (SCDC) Local Plan Core Strategy and Development Management Policies (Ref. 7.22); and
- SCDC 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 **Volume 1, Appendix 6J** 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); and
- Bat Surveys: Good Practice Guidelines, 2nd edition (Ref. 7.33). Please note all bat surveys were conducted in accordance with 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 **Volume 1, Appendix 6J** 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 those 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 **Volume 1, Appendix 6A** 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 **Volume 1, Appendices 6A to 6C** 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	SZC Co. Response.
Royal Society for the Protection of Birds (RSPB) (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 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. Enhancement measures for great crested newts (<i>Triturus cristatus</i>) include planting of hedgerows that would have additional benefits for other species, and would improve wildlife corridors. 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 there are 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.
RSPB (Letter).	5 February 2013. Stage 1 Consultation.	<i>“These sites [including the proposed development] may overlap with areas that support, or have the potential to support, bird species that have suffered serious declines. These included a range of farmland bird species, notably turtle dove, but also include species such as stone-curlew. If it is demonstrated that development would be acceptable, understanding the species that could be potentially affected should guide the restoration plan if sites will only be temporary. The NPPF gives a clear steer that national development projects must seek net gains in biodiversity. Options to maximise their biodiversity benefits should be sought, and not just assume that restoration to farmland will be acceptable. Restoration</i>	Please see previous response. The proposed development includes restoration of the site to agricultural use, but there may be opportunities within that restoration, to enhance biodiversity opportunity, particularly along the site boundaries, and subject to landowner agreement.

NOT PROTECTIVELY MARKED

Consultee	Date	Comment	SZC Co. Response.
		<i>plans should be agreed with NE, RSPB, and Suffolk Wildlife Trust as part of the project design stage, and be submitted for consideration with the Development Consent Order application”.</i>	
RSPB (Letter).	5 February 2013. Stage 1 Consultation.	<i>“The park and ride option at Darsham would be close to the Minsmere River. There are already water quality issues in this area and this development could exacerbate the situation. Given the presence of other options the RSPB considers that this option should not be developed further, unless a SuDS can be designed that prevents poor quality water entering the Minsmere River”.</i>	Sustainable Drainage Systems (SuDS) have been included within the water management design, and have been detailed within Chapter 2 of this volume and section 7.4 of this chapter. This system would include a management system whereby the water would pass through an infiltration basin, and a bypass separator, removing sediments and contaminants, before discharging in the swale thereby maintaining water quality in the Minsmere River.
SCDC (Letter).	5 February 2013. Stage 1 Consultation.	<i>“The assessments of the environmental impacts of the proposed sites appear to be desk-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. Appendix 7A of this volume provides the full ecological baseline for the study area.
		<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 is within Appendix 7A of this volume. While Little Nursery Wood was confirmed to be of value to roosting bats, bat activity recorded within the site was very low, and bats are not dependent on the habitats within the site. Primary mitigation, described in section 7.5 of this chapter, has been included such that there is a 20m buffer between the site and Little Nursery Wood. The operational lighting design has ensured that light levels along the eastern edge of Little Nursery Wood do not exceed 0.1 lux. Close-boarded fence would be installed to prevent light-spill into adjacent

Consultee	Date	Comment	SZC Co. Response.
			Little Nursery Wood.
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>	Appendix 7A of this volume provides the full ecological baseline for the site. This also includes details of the Zones of Influence (Zol) for bats, using published Bat Conservation Trust guidelines.
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 site that included extended Phase 1 Habitat surveys, amphibian surveys, reptile surveys, bat surveys and ornithological (breeding and wintering) surveys. Appendix 7A of this volume includes the full methodology and results of these surveys. Section 7.5 of this chapter provides details of primary and tertiary mitigation.
SCC	17 July 2019 Stakeholder Consultation Workshop.	SCC stressed that Suffolk priority habitats are to be included in the assessment.	Suffolk priority habitats have been detailed and valued within the baseline section (section 7.4). Table 7.10 provides details of the scoping in and out of habitat features.
Suffolk Wildlife Trust	2 February 2017 Stage 2 Consultation	<i>“Tables 9.2 and 10.2 identify the preliminary environmental information for the northern 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>	A full suite of ecology surveys have been undertaken at the site and full assessment of the effects of the proposed development on ecological receptors has been undertaken.
Suffolk Council and Suffolk	10 April 2019 Stage 3 Consultation	<i>“We 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 there is a</i>	The proposed landscaping of the site following reinstatement allows for the native tree and shrub planting installed as part of the construction and operational phase to

Consultee	Date	Comment	SZC Co. Response.
Coastal Council District		<i>permanent enhancement of landscape character.”</i>	remain <i>in situ</i> .
Suffolk Council and Coastal Council District	10 April 2019 Stage 3 Consultation	<i>“We await evidence that there will be no impacts on otters, bats and Great Crested Newts (GCN), the site having records for the latter. A detailed assessment of the impacts of construction and operation of the site on these species and the wider ecology and how they will be mitigated will be required.”</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 section 7.5 of this chapter.
Environment Agency	29 March 2019 Stage 3 Consultation	<i>“Impacts to protected species have not been assessed.”</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 section 7.5 of this chapter.
Natural England	9 April 2019 Stage 3 Consultation	<i>“With regards to the proposed northern park and ride, the retention of three trees with potential to support roosting bats and of the pond with potential to supporting GCN is welcome, as is the replanting of lost hedgerows and trees (Vol 2B, paras 8.3.13 and 8.3.14, pp.430-431). It is noted that operational lighting would be designed to prevent spill and exposure on to Little Nursery Wood; lighting should also be directed away from hedgerows and retained trees on site. Any Temporary Amphibian Fencing erected on site should be regularly inspected and maintained until the end of the restoration works. Furthermore, should further surveys determine that badgers are using the nearby area the bunding should be proofed to prevent excavation by badgers.”</i>	Operational lighting for the proposed development would be designed to prevent light spill to Little Nursery Wood and other habitats, and light levels would not exceed 0.1lux along the eastern side of this wood. The lighting design for the proposed development would use light fittings chosen to limit stray light as detailed in section 7.5 of this chapter. Amphibian fencing would be installed at the start of the first phase of construction, maintained throughout operation, and would remain in place until the end of the site restoration works as detailed in section 7.5 of this chapter. Badger fencing would be installed around the landscape bunds to prevent the establishment of any badger setts in these landscape bunds during operation as part of primary

NOT PROTECTIVELY MARKED

Consultee		Date	Comment	SZC Co. Response.
				mitigation for the development as detailed in section 7.5 .
Suffolk Trust	Wildlife	8 April 2019 Stage 3 Consultation	<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 section 7.5 of this chapter.
Suffolk Trust	Wildlife	23 September 2019 Stage 4 Consultation	<i>“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 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. There are ponds nearby which may contain great-crested newts and so require surveys. It is important no car park runoff is directed into these ponds. It is also likely that the ability of great-crested newt to migrate between the ponds will be impacted. The suggested hedge planting will go some way to mitigate these impacts, however, we would also strongly recommend further pond creation wherever possible. It is likely that</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 section 7.5 of this chapter.</p> <p>On-site hedgerows would be retained where appropriate and supplemented with further planting to permanently infill existing gaps. Replacement habitat planting of a permanent hedgerow along the southern side of Willow Marsh Lane would occur during construction.</p> <p>The proposed landscaping of the site following reinstatement allows for the native tree and shrub planting installed as part of the construction and operational phase to</p>

NOT PROTECTIVELY MARKED

Consultee	Date	Comment	SZC Co. Response.
		<p><i>Little Nursery Wood contains bat roots and so a buffer and embedded mitigation will be required. We assume lighting will be 24 hours and so it is important that low glare, directional lighting is used throughout, to avoid light spill where possible.”</i></p>	<p>remain <i>in situ</i> as well as proposed new planting undertaken as part of re-instatement works.</p> <p>There would be no dewatering during construction as part of the proposed development. In addition, the design of the SuDS infrastructure would allow for surface water run-off to be returned to ground at green field rates.</p> <p>Little Nursery wood would be retained in its entirety, with a buffer distance of up to 20m between the woodland, and the proposed security fence development.</p> <p>Operational lighting for the proposed development would be designed to prevent light spill to Little Nursery Wood and other habitats, and light levels would not exceed 0.1lux along the eastern side of this wood. The lighting design for the proposed development would use light fittings chosen to limit stray light as detailed in section 7.5 of this chapter.</p>

c) Study area

- 7.3.9 The study area includes the land within the site and the Zol of the proposed development. Due to the variable sensitivity of terrestrial ecology and ornithology receptors, the Zol (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 previous survey work. **Appendix 7A** of this volume provides the full ecological baseline for the site.
- 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 Zol. The Zol is defined as “*the area over which ecological features may be affected by potential biophysical changes caused by a proposed project and associated activities*” (Ref. 7.24).
- 7.3.13 The Zols 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 Zol, study area and survey area for the ecological features of relevance to this assessment.

Table 7.4: Specific zones of influence, study areas and survey areas for ecological features.

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

Ecological Feature.		Zol	Study Area.	Survey Area.
Amphibians		2km	2km	Within the site boundary and a 500m buffer area. ¹
Birds		2km	2km	Within the site boundary.
Bats	Natterer's bat (<i>Myotis nattereri</i>).	4km	4km	Within the site boundary as well as Little Nursery Wood immediately adjacent to the site boundary.
	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 IEFs in the context of the WFD.

¹ 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 **Volume 1, Chapter 6** of the **ES**, 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 **Volume 1, Appendix 6J** 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 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). Sensitivity: Feature/receptor has some tolerance to accommodate the proposed

Importance/ Sensitivity.	Guidelines
	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 Zol of the proposed development is determined within **section 7.6** of this chapter where the potential impacts on IEFs are described. Different IEFs may 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, 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); and
- local importance, including an assessment with a Suffolk Coastal District context, or within the Zol 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 often depend on the IEF being assessed.
Frequency	The number of times an activity that will impact biodiversity will occur.
Timing	The timing of an activity or change caused by the proposed development 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

Characteristic	Criteria
	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 or 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’. Under CIEEM guidelines, the significance of 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”*.

7.3.27 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; and
- not significant.

7.3.28 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 of the ES.
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).

i) **Assessment methodology**

i. **Establishing the baseline**

Existing baseline

7.3.29 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 2007 and 2019. 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 in the following sections.

7.3.30 The desk-study exercise comprised the following steps:

- identification of designated sites (statutory and non-statutory) including SPAs, SACs, Ramsar sites, SSSIs and National Nature

Reserves within 5km, and 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 the Joint Nature Conservation Committee records; and
- a review of the Suffolk BAP, Suffolk's Priority Species and Habitats list, and section 41 of the NERC Act.

7.3.31 A detailed suite of ecological survey work was undertaken within the site, and/or its immediate surrounds (i.e. within the Zol) between 2007 and 2019. The following surveys have been conducted within the Zol:

- extended Phase 1 habitat surveys;
- amphibian surveys;
- ornithological surveys (breeding and wintering); and
- bat surveys.

7.3.32 A review of aerial photographs, site visits in association with other protected species surveys in 2014 and 2019, and a 2018 site visit to check site conditions, showed that there have been no material changes to the habitats present within the site since the Extended Phase 1 habitat survey undertaken in 2011. Therefore, the Extended Phase 1 habitat survey was not repeated, and no targeted invertebrate, reptile or other mammal surveys were carried out.

7.3.33 **Appendix 7A** of this volume and its associated annexes contain the detailed methodologies and results of these surveys.

Future baseline

7.3.34 Due to the relatively short operational life of the proposed development (9–12 years), the future baseline considered 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

7.3.35 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

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

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

j) Assumptions and limitations

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

7.3.38 Access was obtained to the majority of the land within the study area. However, it was not possible to obtain access to survey all ponds within a 500 metres (m) radius of the site boundary to conduct great crested newt surveys. Where data is limited, a precautionary baseline has been adopted, based on the presence of great crested newts in the pond within the site boundary. For the purposes of the assessment, it has been assumed that great crested newts may also be present in the remaining off-site ponds that could not be accessed. This constitutes a 'reasonable worst case' for the assessment and development of mitigation.

7.4 Baseline environment

7.4.1 This section presents a description of the baseline environmental characteristics within the site, and in the 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 There are three statutory designated sites of nature conservation importance within 5km of the site. These are: Dew's Ponds SAC and SSSI

(approximately 1.7km north-west), Minsmere to Walberswick Heaths and Marshes SAC, SPA, Ramsar site, and SSSI (this includes Westleton Heath National Nature Reserve) (approximately 3.2km east, at its closest point), and Potton Hall Fields SSSI (approximately 4.1km east).

7.4.4 The SAC, SPA and Ramsar sites support habitat and/or species of European importance listed under Annex I of the EC Birds Directive and Annex I of the European Convention Habitats Directive. These designated sites are therefore considered to be of international importance under the CIEEM guidelines, and of high importance under the EIA-specific methodology. The SSSIs support habitats and species of national importance and are therefore considered to be of national importance under the CIEEM guidelines, and of high importance under the EIA-specific methodology.

7.4.5 There are six non-statutory designated CWSs within 2km of the site. These are: Sillet’s Wood (also on the Ancient Woodland Inventory) (approximately 300m north), Yoxford Wood (also on the Ancient Woodland Inventory) (approximately 900m west), Willowmarsh Wood (also on the Ancient Woodland Inventory) (approximately 1.2km west), Minsmere Valley (approximately 1km south-east), Darsham Marshes (approximately 1.5km south-east), and Big, Common, and Haw Woods (also on the Ancient Woodland Inventory) (approximately 1.3km north-east). 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. These CWS are therefore considered to be of county importance under the CIEEM guidelines, and of medium importance under the EIA-specific methodology.

7.4.6 Full details of the reasons for designation are provided in **Appendix 7A** of this volume. The boundaries of statutory designated sites within 5km of the site boundary, and non-statutory designated sites within 2km are shown on **Figures 7.1** and **7.2** respectively, provided in **Appendix 7A** of this volume.

7.4.7 Due to the distance of the designated sites from the site (the closest of which is Sillet’s Wood CWS, approximately 300m north), the fact that there would be no land take from the designated sites, and the fact that no impact pathways between the designated sites and the site have been identified, designated sites have been scoped out from this assessment.

ii. **Plants and habitats**

7.4.8 **Figure 7.3** in **Appendix 7A** of this volume shows the extended Phase 1 Habitat map for the site.

7.4.9 The site comprises arable farmland with a block of broadleaved woodland (Little Nursery Wood) located adjacent to the site on its western boundary.

A small area of field margin of semi-improved, species-poor grassland is present within the site alongside the east side of Little Nursery Wood as well as an area of tall ruderals in the southern corner of the site. Arable margins are on Suffolk's Priority Species and Habitats list, but no scarce or notable arable plant species were identified within the site. The arable field and arable field margins within the site are of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology

- 7.4.10 Little Nursery Wood is a semi-natural broadleaved woodland 2.8 hectares (ha) in extent that is outside, but bordering, the western site boundary. Little Nursery Wood is not included within the Suffolk Ancient Woodland Inventory, and is therefore unlikely to constitute ancient semi-natural woodland. Little Nursery Wood is of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.
- 7.4.11 Species-poor hedgerows are present along the western, eastern and northern site boundaries; however, none are considered to be 'Important' when assessed against the Wildlife and Landscape Criteria of the Hedgerows Regulations. Hedgerows are a habitat on Suffolk's Priority Species and Habitats list. The hedgerows on-site are of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.
- 7.4.12 One pond is present within the site boundary, and a number of small ponds are located within the study area. Some of these are located in gardens of residential properties on the eastern boundary of the site. A dry pond was also recorded within Little Nursery Wood. Ponds are on Suffolk's Priority Species and Habitats list. This habitat is considered to be of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

iii. Invertebrates

- 7.4.13 The desk-study identified a number of notable, and/or legally protected invertebrate species within the ZOI, most notably a stag beetle (*Lucanus cervus*)² (recorded south-west of the site boundary near Darsham at Yoxford) and a median wasp (*Dolichovespula media*)². Both species could be present within the site boundary; however, there are no recent records in close proximity to the site.

² Please see **Appendix 7A** for details on this species' protection status.

7.4.14 Overall, the habitats within the site consist of intensively managed arable fields that are unlikely to be of importance to invertebrate species. The adjacent Little Nursery Wood contains dead wood, and other features of value to invertebrates but the habitat assemblage of the site, and the wider area, is likely to be of limited value. Therefore, the invertebrate assemblage within the ZOI is considered to be of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

iv. Amphibians

7.4.15 There are 21 ponds within 500m of the site. Eight ponds are located to the east of the A12, which is considered to be a substantial barrier to the dispersal of great crested newts. See **Figure 7.4** in **Appendix 7A** of this volume for the location of these ponds and reference numbers. Of the 13 ponds to the west of the A12, four (Ponds 78, 100, 101 and 102) have been surveyed as part of the current assessment. Access was not granted to the remaining nine ponds.

7.4.16 Pond 100 was subsequently scoped out as it was found to be dry at the time of survey. Great crested newts were recorded in Pond 78, which supports a 'small' population of great crested newts (Ref. 7.31). Other amphibians recorded included smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*). Surveys undertaken in 2019 confirmed the presence of great crested newt DNA in Pond 101; however, great crested newts were found to be absent from Pond 102.

7.4.17 No access was granted for Ponds 79, 80, 81 and 82 for presence/absence surveys, but the Habitat Suitability Index³ assessment scores for Pond 79 and 80 were 'excellent', while Pond 81 was 'good'. Access was not granted to undertake a Habitat Suitability Index assessment at Pond 82. There is good habitat connectivity between Pond 78 and Ponds 79, 80, 81 and 82 through field margins, Little Nursery Wood, and gardens to residential properties on the west side of the A12 (all suitable for newt foraging and hibernation). It is therefore assumed that great crested newts are present within Ponds 79, 80, 81 and 82 on a precautionary basis. The population within Pond 78, 79, 80, 81, 82 and 101 would represent a meta-population⁴.

³ The Habitat Suitability Index assess the potential for ponds to be suitable to support a breeding population of great crested newts. A high score indicates a pond is more suitable than a pond with a lower score.

⁴ Great crested newts often exist in meta-populations, a group of associated populations which breed in and live around clusters of ponds (Ref. 7.41).

- 7.4.18 Great crested newts are included on Suffolk's Priority Species and Habitats list, and section 41 of the NERC Act, as well as under Schedule 5 of the Wildlife and Countryside Act, and Schedule 2 of the Conservation of Habitats and Species Regulations. The great crested newt population within the ZOI is considered to be of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

v. Reptiles

- 7.4.19 There is a historic record of a grass snake (*Natrix helvetica helvetica*) 700m from the site boundary. Within the site boundary, there is some potential for the grass margin of the arable field to provide sheltering and foraging habitat for all four common reptile species (i.e. grass snake, adder (*Vipera berus*), common lizard (*Zootoca vivipara*), and slow-worm (*Anguis fragilis*)), but the arable field itself is considered sub-optimal habitat. There is also some potential for hibernation sites within Little Nursery Wood, and in brick and rubble identified adjacent to White House Farm, as well as some breeding and foraging opportunities for grass snake within the habitat surrounding the dry pond within Little Nursery Wood. However, the available habitat to support reptile species is limited, of little value, and poorly connected to other suitable habitat, with the surrounding area primarily comprising arable farmland.

- 7.4.20 All four common species of reptile are included on Suffolk's Priority Species and Habitats list and Section 41 of the NERC Act. However, given the limited potential for reptiles within the site, the reptile assemblage is considered to be of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

vi. Birds

- 7.4.21 During breeding bird surveys (undertaken in 2014), a total of 14 bird species of nature conservation importance were identified, including: herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), linnet (*Carduelis cannabina*), marsh tit (*Poecile palustris*), nightingale (*Luscinia megarhynchos*), skylark (*Alauda arvensis*), yellowhammer (*Emberiza citrinella*), mistle thrush (*Turdus viscivorus*), song thrush (*Turdus Philomena*), dunnoek (*Prunella modularis*), bullfinch (*Pyrrhula pyrrhula*), meadow pipit (*Anthus pratensis*), stock dove (*Columba oenas*), and swift (*Apus apus*).

- 7.4.22 During Winter bird surveys (undertaken in 2014 and 2015), 16 bird species of conservation importance were identified, including: fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*), herring gull, house sparrow, linnet, marsh tit, skylark, song thrush, starling (*Sturnus vulgaris*), woodcock (*Scolopax rusticola*), mistle thrush, yellowhammer, dunnoek, bullfinch, black-headed

gull (*Chroicocephalus ridibundus*), and stock dove. Full details of the species identified during the surveys are presented in **Appendix 7A** of this volume.

- 7.4.23 Of the species recorded during surveys, linnet, skylark and yellowhammer are predominantly associated with arable farmland habitat that is abundant in Suffolk. House sparrow, dunnock and starling are often associated with human habitation and hedgerows. Herring gull forage widely over large areas, and require a cliff or large flat-roofed building to nest, so will not be breeding within the site boundary. Marsh tit, nightingale, song thrush, mistle thrush, woodcock, and bullfinch are more associated with woodland, such as Little Nursery Wood.
- 7.4.24 The breeding and wintering bird assemblage within the Zol is considered to be of local importance under the CIEEM guidelines and of low importance under the EIA-specific methodology.

vii. Bats

- 7.4.25 Seven bat species have been recorded historically within the study area, these being: Natterer's bat, noctule, soprano pipistrelle, Nathusius' pipistrelle, serotine, barbastelle and brown long-eared bat. Habitats within the site primarily consist of open arable land, which is of limited value for bats. However, the edges of the site, primarily hedgerows, as well as the adjacent Little Nursery Wood, are considered to provide suitable foraging, commuting⁵ and roosting habitat.
- 7.4.26 Assessment of trees with bat roost potential identified three trees (one high potential, one medium potential, and one undetermined potential) within the site with the potential to support roosting bats. These three trees would be retained as part of the proposed development. A greater roost resource is present within Little Nursery Wood adjacent to the site where 41 trees with the potential to support roosting bats, including a confirmed brown long-eared bat roost, were identified (please refer to **Figure 7.8** in **Appendix 7A** of this volume).
- 7.4.27 Activity surveys recorded predominantly common pipistrelle and soprano pipistrelle activity, with low levels of activity for all other species. The results from the survey suggested the potential use of Little Nursery Wood by roosting barbastelle, common pipistrelle, noctule and soprano pipistrelle, in addition to the confirmed brown long-eared bat roost. Substantial activity

⁵ 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.

was also recorded throughout the night within this woodland block, and both common and soprano pipistrelle were recorded entering the woodland during activity surveys. Little Nursery Wood is therefore considered likely to support roosts (including the brown long-eared bat roost noted), and be used as a foraging resource by several species. Historic surveys undertaken in 2011, provided in **Appendix 7A** of this volume, suggest the potential presence of roosting barbastelle within Little Nursery Wood, and static detector surveys in 2015 provided some supporting evidence to this. A small number of barbastelle were observed using the eastern edge of Little Nursery Wood although the number of passes did not suggest this linear feature was a regular or frequently used commuting route. No barbastelles were observed emerging from Little Nursery Wood during the activity surveys in 2015. See **Appendix 7A** of this volume for the full baseline results.

7.4.28 Bats using the site are likely not dependent on the sub-optimal habitats present, and would also be using a range of other habitats in the Zol, including Little Nursery Wood, which is adjacent to the site boundary.

7.4.29 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. The roosting, foraging and commuting bats within the Zol is considered to be of county importance under the CIEEM guidelines, and of medium importance under the EIA-specific methodology.

viii. Other mammals

7.4.30 European otter (*Lutra lutra*), Western European hedgehog (*Erinaceus europaeus*), brown hare (*Lepus europaeus*), water shrew (*Neomys fodiens*), and water vole (*Arvicola terrestris*) were identified from the desk-study as being present within the Zol of the site.

7.4.31 Due to the lack of suitable waterbodies, European otter and water vole are not considered likely to be present within the site boundary. However, one water shrew record was recorded in Pond 78 during surveys for great crested newts in 2015. Water shrews are reported as declining in Suffolk (Ref. 7.35). The water shrew is on Suffolk's Priority Species and Habitats list, and considered locally important, but is not included within Section 41 of the NERC Act. Water shrew within the Zol is considered to be of local

importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

7.4.32 Little Nursery Wood and the boundary hedgerows present provide potentially suitable habitat for hedgehogs, and this species could be present within the site boundary. Hedgehogs are on Suffolk's Priority Species and Habitats list, and listed on section 41 of the NERC Act. Hedgehog within the ZOI is considered to be of local importance under the CIEEM guidelines, and of very low importance under the EIA-specific methodology.

7.4.33 One of the 12 brown hare desk-study records within the study area was within the site boundary, and up to three brown hares were recorded incidentally during the breeding and wintering bird surveys. 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 considered to be of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

7.4.34 The Extended Phase 1 Habitat survey undertaken in 2011 located two badger outlier setts in the vicinity of the site; however, these were no longer present in 2016, and there were no signs of any badgers within the site boundary. The arable fields of the site are considered as sub-optimal foraging habitat for badgers, although the field margins and Little Nursery Wood could provide foraging habitat. Badgers within the ZOI is considered to be of local importance under the CIEEM guidelines, and of low importance under the EIA-specific methodology.

b) **Future baseline**

7.4.35 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.

7.4.36 The closest consented scheme due to be developed is an 82 bedroom hotel development located on the east side of the A12, approximately 80m from the site. This scheme is not considered likely to materially alter the future baseline in respect of ecology as it is unlikely to alter the areas and resources within the site and ZOI. In addition, appropriate mitigation would

be implemented as part of the consented scheme to ensure the favourable conservation status of all relevant IEFs is maintained.

c) **Important Ecological Features**

7.4.37 Following a review of the known baseline information within the Zol, **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 require further consideration within this chapter.

7.4.38 There are several ecological features that, while not of significant nature conservation value within the Zol, 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** of this chapter where appropriate mitigation to ensure legislative compliance for their protection has been described.

Table 7.10: Determination of Important Ecological Features to be taken forward for detailed assessment.

Feature/Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
Statutory designated sites within 5km of the site boundary.	International and National/High.	<p>These statutory designated sites support a range of habitats and European protected species. Given the distance of these sites from the site (the closest of which is 1.7km west), and the implementation of the primary and tertiary mitigation measures detailed in section 7.5 of this chapter, no direct or indirect impacts are anticipated on the statutory designated sites.</p> <p>Dew's Ponds SAC and SSSI, Minsmere to Walberswick Heaths and Marshes SAC, SPA and Ramsar sites, and Potton Hall Fields SSSI have, therefore, been scoped out of the detailed assessment.</p>	Scoped out.
Non-statutory designated sites within 2km of the site boundary.	County/Medium.	<p>CWS support a range of habitats types that are listed on section 41 of the NERC Act which are targeted for action in the Suffolk BAP. Given the distance of these sites from the site, and the implementation of the primary and tertiary mitigation measures detailed in section 7.5 of this chapter, no direct or indirect impacts are anticipated on the non-statutory designated sites.</p> <p>All six CWS (Sillet's Wood, Yoxford Wood, Willowmarsh Wood, Minsmere Valley, Darsham Marshes, and Big, Common and Haw Woods) have therefore been scoped out of the detailed assessment.</p>	Scoped out.
Ponds within the site boundary and Zol.	Local/Very Low.	<p>Ponds are a habitat listed on Suffolk's Priority Species and Habitats list. One pond (Pond 78) is located within the site boundary while a number of other ponds are located within the wider study area.</p> <p>As part of the primary mitigation described in section 7.5 of this chapter, Pond 78 would be retained within the proposed development, and would be further protected from construction and operational impacts through the creation of a 3m high landscape bund along the north-west and southern boundaries, as well as a 10m buffer between the pond and construction works.</p> <p>Additionally, this pond is known to support a population of great crested newts, which is assessed as an IEF in its own right.</p> <p>Ponds have therefore been scoped out of the detailed assessment.</p>	Scoped out.
Hedgerows	Local/Very Low.	<p>Hedgerows are a habitat listed within the Suffolk's Priority Species and Habitats list, however, hedgerows are widespread in Suffolk, and no species-rich sections were identified. There would be loss of species-poor hedgerow to accommodate the access road to the A12 and Willow Marsh Lane, but all remaining hedgerows would be</p>	Scoped out.

NOT PROTECTIVELY MARKED

Feature/Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
		retained as part of the primary mitigation measures detailed in section 7.5 of this chapter. Hedgerows are widespread in Suffolk, and it is not considered that the loss of a small section of species-poor hedgerow at this location would result in a significant effect. Therefore, hedgerows have been scoped out of the detailed assessment.	
Arable fields and arable field margins.	Local/Very Low.	Arable field margins are on Suffolk’s Priority Species and Habitats list; however, no scarce or notable arable weed species have been identified within the site boundary. Arable habitat is also widespread in Suffolk, and generally of limited ecological value. These habitat types have therefore been scoped out of the detailed assessment.	Scoped out.
Little Nursery Wood.	Local/Low.	Little Nursery Wood is a semi-natural broadleaved woodland that has some ecological diversity. It is not recorded on the ancient woodland inventory, and is therefore likely to be relatively recent in origin. Little Nursery Wood would be retained in its entirety, and a 20m buffer would be maintained between the proposed perimeter fence and Little Nursery Wood during construction and operation. Given the primary and tertiary mitigation detailed within section 7.5 of this chapter, no significant effects are considered likely. Additionally, the species that are supported by this habitat (notably the bat assemblage, reptiles and breeding birds), have been considered as separate ecological features. This habitat has therefore been scoped out of the detailed assessment.	Scoped out.
Great crested newt.	Local/Low.	Pond 78 within the site boundary supports a population of great crested newts, and great crested newt DNA was confirmed in Pond 101. Pond 78 within the site, would be retained. While other nearby ponds (Ponds 79 to 82) were unable to be accessed to confirm presence of great crested newt, there are historic records within the study area. Therefore, on a precautionary basis, it is assumed that this species exists within the wider ZOI, and that these ponds also hold populations of this species. The population found within Ponds 78 to 82 and Pond 101 is likely to represent a meta-population of great crested newts. Great crested newts are a priority species for conservation action in the county, are protected under Schedule 5 of the Wildlife and Countryside Act, and Schedule 2 of the Conservation of Habitats and Species Regulations, and are included within Section 41 of the NERC Act. Although the site comprises largely arable fields, considered to be suboptimal terrestrial habitat for great crested newts, the field margins, Little Nursery Wood, and the gardens of residential properties on the west side of the A12,	IEF Scoped in.

NOT PROTECTIVELY MARKED

Feature/Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
		<p>provide habitat that is suitable for great crested newts in their terrestrial phase, for both foraging and hibernation. Great crested newts have therefore been scoped in to the detailed assessment. Details of mitigation measures in relation to great crested newt are included in section 7.5 of this chapter.</p>	
Reptile assemblage.	Local/Very Low.	<p>Habitat within and adjacent to the site boundary is of little value to reptile species. From the review of available baseline data, the reptile population is predicted to be fragmented within the wider landscape, and the population within the Zol of the site would not be significant to the wider reptile population within Suffolk. Overall, it is considered that any impacts that may affect foraging and/or hibernating reptiles are unlikely to be significant.</p> <p>The reptile assemblage has therefore been scoped out of the detailed assessment. However, all four common reptile species (adder, common lizard, grass snake and slow-worm) are protected under section 41 of the NERC Act, and a limited amount of habitat to be lost was identified as having the potential to support a small population of foraging, and/or hibernating reptiles. Tertiary mitigation measures are described in section 7.5 of this chapter.</p>	Scoped out.
Breeding and wintering bird assemblage.	Local/Low.	<p>The breeding and wintering bird assemblage identified within the site is representative of the habitats present, and the populations observed on-site are considered 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. Additionally, the nesting and foraging resource of Little Nursery Wood adjacent to the site is assumed to still be present. It is therefore considered unlikely that any significant effects would occur on the breeding and wintering bird populations as a result of the proposed development. Breeding and wintering birds are therefore scoped out of the detailed assessment.</p> <p>However, breeding birds are protected under the Wildlife and Countryside Act and there may be the potential for impacts on breeding birds, should works be undertaken during the breeding bird period (end of February to the end of August inclusive). Tertiary mitigation measures are described in section 7.5 of this chapter in order to adequately protect breeding birds.</p>	Scoped out.
Roosting, foraging and commuting bats.	County/Medium.	<p>At least seven bat species have been recorded within the site or the relevant Zol. Little Nursery Wood contains a large number of trees with the potential to support roosting bats and a bat roost with two brown long-eared bats was confirmed at the time of surveying.</p> <p>Activity was recorded of 'big bat' species, common pipistrelle, and soprano pipistrelle as emerging from Little</p>	IEF Scoped in.

NOT PROTECTIVELY MARKED

Feature/Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
		<p>Nursery Wood, suggesting the potential for these species to be roosting in this location. Survey recordings 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. This species is potentially roosting within Little Nursery Wood.</p> <p>The degree of sensitivity to disturbance that bats display varies between species; however, it is recognised that all bat species can be negatively impacted by human activities. All bat species in the UK are protected under Annex IV of the Habitats Directive, transposed to UK law under the Conservation of Habitats and Species Regulations. Additional relevant legislation includes the Wildlife and Countryside Act, and section 41 of the NERC Act.</p> <p>The bat assemblage is therefore scoped in to the detailed assessment. Details of mitigation measures in relation to bats are included in section 7.5 of this chapter.</p>	
Brown hares.	Local/Low.	<p>A population of two or three individuals were recorded on-site during surveys. While a limited number of brown hare are likely to be found within or adjacent to the site, there is sufficient adjacent habitat to support this species, and the population found within the site boundary is not considered to be a significant contribution to the potential wider population within the Zol. The effects of the proposed development on this highly mobile species are unlikely to be significant and brown hare have therefore been scoped out.</p> <p>The brown hare is included on Suffolk’s Priority Species and Habitats list, and is listed as a NERC Act, species of principal importance for the purpose of conserving biodiversity. Therefore, details of the tertiary mitigation measures that would be employed to safeguard brown hare are described in section 7.5 of this chapter.</p>	Scoped out.
Water shrew.	Local/Low.	<p>This species was recorded within Pond 78 within the site boundary. The population found within this pond is not considered to be particularly important in the context of the wider population of the species, and the pond and adjacent habitat is being retained in its entirety with a 10m buffer between the pond and the construction works as part of the proposed development.</p> <p>Water shrews are considered to be declining in Suffolk (Ref. 7.35). The water shrew is included on Suffolk’s Priority Species and Habitats list, and considered locally important, but is not included within Section 41 of the NERC Act, so is not identified as a species of principal importance for the purpose of conserving biodiversity in England.</p> <p>The mitigation measures described for Pond 78, and great crested newts included in section 7.5 of this chapter would be sufficient to mitigate for any potential impacts on water shrew. This species has therefore been scoped out of the detailed assessment.</p>	Scoped out.

Feature/Receptor.	Importance (CIEEM/EIA Methodology).	Justification	Scope In/Out.
Hedgehog	Local/Very Low.	<p>Little Nursery Wood adjacent to the site and the hedgerows that surround the site provide potentially suitable habitat for hedgehogs. Little Nursery Wood is assumed to still be present, but there would be some loss of a small section of hedgerow to accommodate the access road to the A12.</p> <p>While hedgehogs are likely to be found within or adjacent to the site, there is sufficient adjacent habitat to support this species, and the effects of the proposed development on this species is unlikely to be significant.</p> <p>Hedgehog has therefore been scoped out of the detailed assessment.</p> <p>Hedgehog is included on Suffolk’s Priority Species and Habitats list, and listed on section 41 as a species of principal importance, and details of the tertiary mitigation measures that would be employed to safeguard hedgehogs are described in section 7.5 of this chapter.</p>	Scoped out.

7.4.39 In summary, the IEFs taken forward for a detailed assessment within **section 7.6** of this chapter are:

- IEF: Great crested newts; and
- 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 in the following sections, 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 ecology has been provided below:

- The operational park and ride facilities on-site would be bounded by a 1.8m high 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 Little Nursery Wood which is adjacent to the site. The security fence would also be sufficient to prevent access by badgers.
- Landscape bunds (grassed), 3m in height, would be located along part of the eastern, and part of the northern boundary of the car parking area to aid in the screening of the proposed development from the adjacent landscape. This would also provide acoustic screening, as outlined in **Chapter 4** of this volume.

NOT PROTECTIVELY MARKED

- Badger fencing would be installed around the landscape bunds to prevent the establishment of any badger setts in these landscape bunds during operation, which would then provide an ecological constraint during removal and reinstatement.
- There would be no dewatering during construction as part of the proposed development. In addition, the design of the SuDS infrastructure would allow for surface water run-off to be returned to ground at green field rates, so there would be no changes to the local hydrology regimes.
- Operational lighting for the proposed development would be designed to prevent light spill to Little Nursery Wood and other habitats, and light levels would not exceed 0.1lux along the eastern side of this wood. 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 use the nearby tree lines or habitats for roosting or foraging.
- Little Nursery Wood:
 - The woodland would be retained in its entirety, with a buffer distance of 20m between the woodland and the proposed development. There would be no direct loss of woodland habitat, and its associated species, and the buffer distance would assist in minimising impacts associated with the proposed development (such as noise, lighting and human disturbance).
 - The **Outline Drainage Strategy**, provided in **Appendix 2A** of **Volume 2** of the **ES**, for the site includes the provision of SuDS infrastructure (such as swales) which would minimise surface water run-off and prevent diffuse pollution from sediment and other pollutants arising.
 - In addition to the previous measures, close-boarded fencing would be erected along the inside of the security fence where it is adjacent to Little Nursery Wood to provide additional mitigation for lighting impacts (including those from vehicle headlights) and noise impacts. The close-boarded fencing would be retained during the operational phase to act as screen for lighting (from vehicle headlights) and noise impacts.
- Hedgerow habitat:
 - A 10m buffer would be maintained along the north-east boundary (along the rear of the existing houses), and south-west boundary

NOT PROTECTIVELY MARKED

- (adjacent to the railway line south of Little Nursery Wood) to provide some protection to existing hedgerows. This would assist in minimising any impacts (such as noise, lighting and human disturbance) on other ecological receptors associated with the site.
- On-site hedgerows would be retained where appropriate, with the hedgerows along the eastern and northern site boundaries supplemented with further planting to permanently infill existing gaps which currently do not serve a purpose (for example, access).
 - Replacement habitat planting of a permanent hedgerow along the southern side of Willow Marsh Lane during construction (which would also provide suitable great crested newt habitat) would result in the planting of approximately 585m of hedgerow to compensate for the 220m lost during construction.
 - Pond 78 would be retained, directly protecting the known great crested newt population within the site boundary, as well as the potential water shrew population. A 10m buffer would be maintained around the pond, within which no construction works would take place other than the erection of ecological fencing. Additionally, the pond would be protected from construction and operational impacts by the landscape bund along the eastern boundary of the site.
 - Great crested newts:
 - One-way directional newt fencing would be installed around the perimeter of the car parking areas, swales and landscape bunds, to prevent great crested newts from entering the site but allow them to leave should they accidentally gain access.
 - Fencing would be sited to ensure that Pond 78 is excluded in order to maintain connectivity with existing, suitable great crested newt habitats. This approach would eliminate the need to translocate great crested newts away from the landscaped margins of the site when these areas are returned to agriculture use. This fencing would be installed at the start of the first phase of construction, maintained throughout operation, and would remain in place until the end of the site restoration works.
 - Two small pipes or culverts would be placed beneath the new access road to allow the passage of great crested newts underneath the road. One of these would be on the north side of the landscape bund, and one would be at the point at which the new access road meets Willow Marsh Lane. Great crested newts

NOT PROTECTIVELY MARKED

would be directed to the culverts by one-way directional newt fencing.

- The planting of hedgerow along the southern side of Willow Marsh Lane with a rough, unmanaged grassland margin adjacent, and extending along the eastern and western site boundaries would minimise great crested newt habitat severance and habitat loss, facilitate continued access to foraging and hibernation sites within Little Nursery Wood, and allow connectivity between Ponds 78 to 82.

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 will 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 **Code of Construction Practice (CoCP)** (Doc Ref. 8.11). The **CoCP** (Doc Ref. 8.11) would be informed by relevant environmental legislative requirements, as well as general requirements and compliance with current standards, construction and operational experience. The **CoCP** (Doc Ref. 8.11) would also 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 the removal and reinstatement phase.

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 to 19:00 hours, and some lighting may be required during the winter months, dependent upon what construction activities are taking place. Outside of these hours, lighting would be required at night for site 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

Additionally, works with the potential to affect great crested newts would be carried out either under a reasonable avoidance methods statement, or under a licence from Natural England, as required, following agreement with Natural England on an appropriate mitigation strategy. In addition to the primary mitigation measures identified previously, this would likely include:

- Seasonal constraints to the timing of the installation of the one-way directional newt fencing described in **section 7.5a** of this chapter. If the timing of fence installation means there would be a risk of encountering newts as they move between their ponds and terrestrial habitat (notably in February/March), then the fencing would be combined with pitfall traps, and any trapped newts would be collected, and transferred to one of the ponds to the west of the A12 where great crested newts are known to occur (e.g. Pond 78 or 101);
- If possible, the removal of hedgerow would be undertaken outside of the amphibian hibernation period (October to February inclusive). If this is not possible, vegetation would be cut to the ground (which would 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 great crested newt hibernation season is over. This work would be overseen by a suitably experienced Ecological Clerk of Works (ECoW);
- The habitat around Pond 78 would be improved, and tussocky grassland and scrub encouraged to grow for the benefit of great crested newts and hibernation features would be installed. This would improve the foraging habitat around Pond 78 and would provide suitable hibernation sites adjacent to the pond. Further details would be included within the great crested newt development licence and subject to agreement with Natural England. In addition, this commitment would need to be agreed with the landowner. In the event of the landowner not agreeing to the above approach, alternative measures would be adopted.

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; and
- 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 ECoW.

7.5.11 The removal of vegetation, ground clearance, and the commencement of construction activities have the potential to risk killing or injuring nesting birds, and to damage or destroy nests, including those of ground-nesting species, should works be undertaken during the breeding bird season (considered to be late February to August). Birds and their nests are protected under the Wildlife and Countryside Act, and the 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 nesting birds are identified during this process, works in the vicinity of the nest (estimated to be a 10m standoff) would cease until the young have fledged.

7.5.12 No evidence of badgers was recorded during the most recent surveys within the site and survey area, and the surrounding habitat is sub-optimal for this species; however, there is the potential for badgers to enter the site during construction. Therefore, the following measures would be undertaken during construction:

- prior to construction works commencing, a pre-construction walkover of the site would be conducted in order to identify whether there are any signs of badgers, and/or any newly established setts that may be impacted by the works. Should any 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); and

- 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) 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 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 Zol 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

7.6.3 During the construction phase of works, the main impact pathways would be associated with:

- land take;
- habitat fragmentation (including connectivity);

- incidental mortality of species;
- disturbance effects on species population (comprising light, noise and visual effects);
- changes in water quality;
- alteration of local hydrology and hydrogeology; and
- changes in air quality.

7.6.4

A number of the construction impact pathways have been scoped out of this assessment where, due to the primary and tertiary mitigation detailed in **section 7.5** of this chapter an impact is avoided, or where it is considered that the effect of an impact would be negligible. The impact pathways that have been scoped out of this assessment, along with the rationale for scoping them out, are as follows:

- effects of changes in local hydrology and hydrogeology, air quality and water quality on great crested newts: given the mitigation measures noted in **section 7.5**, the water quality of ponds within the Zol is unlikely to be impacted. Tertiary mitigation includes management of construction activities as outlined in the **CoCP** (Doc Ref. 8.11), including compliance with relevant environmental legislation that would minimise dust pollution, and air quality changes that could impact ponds and associated vegetation. There would also be no dewatering as part of the proposed development, and the drainage design would allow for surface water run-off is returned to ground at green field rates, and so there would be no changes to local hydrology; and
- incidental mortality to bat species: construction works would entail the movement of plant and other vehicles around the site. The likelihood of incidental mortality to bat species from vehicles accessing the site would be minimised as traffic would be travelling at low speeds. The construction working hours would generally not include night-time work (Monday to Saturday 07:00-19:00 hours), and working hours would largely avoid the times when bats are active. This potential impact pathway on the bat assemblage has therefore been scoped out of the assessment.

7.6.5

Of the impact pathways taken forward within the assessment, the specific impact pathways that could be experienced by each 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:

- 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** of this chapter);
- rationale for prediction of effect on integrity (of a site or ecosystem) or conservation status (of a habitat or population); and
- effect without further (secondary) mitigation.

7.6.6 The remaining elements of the CIEEM assessment process, mitigation (if required), and significance of effects of residual impacts after further mitigation, are discussed in **sections 7.7** and **7.8** of this chapter respectively.

i. **Important Ecological Feature: Great crested newt**

7.6.7 During construction, the impact pathways experienced by great crested newts would be associated with:

- habitat loss;
- habitat fragmentation (including connectivity)⁶; and
- incidental mortality.

7.6.8 The characterisation of the previous impacts is described in detail.

Habitat loss

7.6.9 Great crested newts are sensitive to habitat loss due to their two-stage lifecycle, breeding within aquatic environments, and foraging and hibernating within terrestrial environments. Pond 78 would be retained and protected from impacts by 3m high landscape bunds, and a 10m buffer between the pond and the construction works, as detailed in **section 7.5** of this chapter, to safeguard great crested newts during the aquatic phase of their lifecycle.

⁶ The population of great crested newts within the ZoI at Darsham is considered to be a single meta-population, and so the impact pathways of habitat loss and habitat fragmentation are considered together as a single impact pathway.

NOT PROTECTIVELY MARKED

- 7.6.10 The behaviour of great crested newts during their terrestrial phase is relatively poorly understood (Ref. 7.40). They use underground crevices, log or rock piles, and spaces in between tree roots as terrestrial refuges when conditions are dry (summer) or cold (winter), and forage above ground mostly at night. Rough grassland, scrub and woodland are all favourable foraging habitats. Any potential impact from habitat loss on great crested newts would be during their active terrestrial phase, or during hibernation, generally between March and October and October to mid-March respectively.
- 7.6.11 Within the Zol, hedgerows, Little Nursery Wood, and gardens on the west side of the A12 provide suitable terrestrial habitat for great crested newts (for foraging, dispersal and hibernation). Great crested newts would potentially experience habitat loss during construction of the proposed development due to the loss of an approximately 220m of species-poor hedgerow to allow for the construction of the access road to the A12 and Willow Marsh Lane, and loss of all of the arable field (considered to be of low value for foraging great crested newts) and field margins. As outlined in **section 7.5** of this chapter, the extent of habitat loss has been minimised as far as practicable by the retention of the woodland blocks, including Little Nursery Wood, and the retention of the majority of hedgerows within the site boundary. The area of tall ruderals to the south of the site would also be retained, and the small area of field margin east of Little Nursery Wood would be protected through the inclusion of a 20m buffer. Additional primary mitigation measures include the planting of a new hedgerow along Willow Marsh Lane, the development of unmanaged grassland margins, allowing the development of tussocky rough grassland and scrub around Pond 78 for the benefit of great crested newts, and the installation of new hibernation features.
- 7.6.12 Natural England guidelines (Ref. 7.41) for measuring the scale of impacts from a development require estimation of the loss of terrestrial habitat for great crested newts within 50m, 51–250m and 251–500m of breeding ponds. Habitat destruction within 50m has a high impact, habitat destruction within 50–250m has a medium impact, and habitat destruction within 251–500m of a breeding pond has a low impact. Note that this methodology reflects the total amount of terrestrial land loss. **Table 7.11** details the approximate area of great crested newt habitat that would be lost within the areas of available habitat within each of the Natural England defined distances.

Table 7.11: Approximate area of great crested newt habitat that would be lost.

Distance	Approximate Great Crested Newt Habitat Available.	Approximate Great Crested Newt Habitat Lost Due to the Proposed Development.	Percentage (%).
50m	4.7ha	0.45ha	9.5%
51–250m	31.0ha	13.6ha	44%
251–500m	62.7ha	11.2ha	18%

7.6.13 Most of the land that would be lost is arable land, considered to be of low value for foraging great crested newts. The shortest distance between the closest pond (Pond 78) and habitat to be lost would be approximately 10m. Ponds 79, 80, 81 and 82 are approximately 50m, 75m, 80m and 40m away respectively from the closest area of habitat to be lost, and Pond 101 is approximately 230m away, see **Figure 7.4 in Annex 7A.1 (Appendix 7A)**. Following Natural England guidelines, this could result in a high magnitude of impact for Ponds 78, 79 and 82, and medium magnitude of impact for Ponds 80, 81 and 101. The meta-population is assumed to be distributed across six ponds and would be less vulnerable to habitat change than similar-sized populations based on single breeding ponds (Ref. 7.42). The great crested newt meta-population would, therefore, have a low sensitivity to change from this impact. The habitat loss would be long-term (the construction, operational, and removal and reinstatement phases are expected to be 9–12 years), but reversible, as on completion of the removal and reinstatement phase, the land would be returned to agricultural use.

7.6.14 Overall, given the primary mitigation measures outlined previously, including the improvement of habitats immediately surrounding Pond 78, habitat loss would result in a long-term, reversible, minor adverse effect, which is considered to be **not significant**.

Habitat fragmentation

7.6.15 In addition to potential effects of habitat loss, there is potential for construction works to impact the great crested newts’ ability to move between breeding, foraging and hibernation sites, impairing their ability to breed, forage and hibernate. Construction activity such as site clearance and vegetation removal, construction of the landscape bund, and ongoing vehicle and equipment movements would sever access between the meta-population within Ponds 78 to 82 and 101, and Little Nursery Wood. Two small pipes or culverts would be placed beneath the new access road to allow the continued passage of great crested newts underneath the new road, and great crested newts would be directed to these through the placement of one-way directional newt fencing. This measure would be installed during the construction phase, thereby resulting in a short-term, temporary impact of habitat fragmentation until the culverts are in place.

The habitat fragmentation would be reversible, because after the operational phase, the land would be restored to its existing condition.

- 7.6.16 Overall, given the primary mitigation measures, habitat fragmentation would result in a short-term, temporary, reversible impact of a low magnitude, which would have a minor adverse effect, which is considered to be **not significant**.

Incidental mortality

- 7.6.17 Construction activities would include vegetation and ground clearance works during the preliminary works and site establishment phases of construction within the arable field, field margins and removal of approximately 220m of hedgerow.

- 7.6.18 There is good connectivity between Ponds 78 to 82, and 101, and it is likely that great crested newts from this meta-population would attempt to cross the proposed development during construction to access Little Nursery Wood and the surrounding arable field margins and hedgerow to forage and hibernate, leading to the potential for injury and incidental mortality.

- 7.6.19 Primary and tertiary mitigation measures to safeguard great crested newts and minimise the likelihood of injury, and incidental mortality include the retention of Pond 78, protected from impacts by a 3m high landscape bund and 10m buffer, the installation of two small pipes or culverts beneath the new access road to allow safe passage of great crested newts, and one-way directional newt fencing to exclude newts from the site, and guide them to culverts. A phased vegetation clearance programme would also minimise this effect, and along with the installation of one-way directional newt fencing, would be timed to take into consideration species seasonal constraints. These measures would prevent incidental injury or mortality during the preparatory works and throughout the construction phase, which is expected to last approximately 12–18 months.

- 7.6.20 Incidental injury or mortality would have a one-off, non-reversible, permanent impact on the great crested newt meta-population of a low magnitude. However, given the primary and tertiary mitigation measures it is likely that the number of individuals killed, if any, would be low. This would result in a negligible adverse effect, which is considered to be **not significant**.

ii. Important Ecological Feature: Bat assemblage

- 7.6.21 During the construction phase of works, the impacts would be associated with:

- land take (habitat loss);
- disturbance from noise; and
- disturbance from light.

7.6.22 The characterisation of the aforementioned impacts has been detailed in the following sections.

Habitat loss

7.6.23 The construction of the proposed development would result in the loss of primarily arable land as well as approximately 220m of species-poor hedgerow. As outlined in **section 7.5**, the extent of habitat loss has been minimised as far as practicable by retaining woodland blocks, including Little Nursery Wood, that lie immediately adjacent to the site boundary and the retention of most of the hedgerows along the site boundary. These mitigation measures ensure that those habitats most suitable for bats are retained. Additionally, no trees would be felled as part of the proposed development, and therefore there would be no loss of any trees with roost features.

7.6.24 While none of the habitat that would be lost has been identified as having the potential to support roosting bats, there is the potential for the loss of foraging habitat within the arable field and the section of hedgerow to be removed. Additionally, while the hedgerows on-site were not confirmed to be used by commuting or foraging bats, they comprise linear features that may be used by bat assemblages. Construction could therefore have an effect on foraging and commuting bats.

7.6.25 The proposed development would result in the loss of approximately 22.29ha of sub-optimal arable foraging habitat, and the loss of approximately 20m of hedgerow. The proportion of foraging habitat lost to the proposed development 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, developed following an extensive literature review by the Bat Conservation Trust (Ref. 7.43), has been used to make this assessment, as detailed in **Table 7.12**.

Table 7.12: Summary of the proportion of each bat species’ Core Sustenance 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	1.96%
Soprano pipistrelle. Brown long-eared bat. Nathusius’ pipistrelle.	3km	0.87%
Noctule	4km	0.49%
Barbastelle	10km	0.08%

7.6.26 **Table 7.12** 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. In addition, the habitats to be lost are not of high value to bats, and are unlikely to be an important component of any of the species’ CSZs.

7.6.27 The habitats present within the site are largely sub-optimal for bats, being intensively managed for arable farming purposes. The sub-optimal arable land supports few invertebrates on which bats can forage. During activity and static detector surveys, activity indicative of both foraging, and commuting bats was recorded; however, activity levels were consistently low, with marginally increased activity levels within, and adjacent to, the broad-leaved plantation woodland compared to the open arable habitat. The bat assemblage within the ZOI is therefore not considered to be reliant on the arable habitats within the site for foraging.

7.6.28 The requirement of bats for linear features varies between species, with the majority of species (serotine, noctule, common pipistrelle, Nathusius’ pipistrelle, and soprano pipistrelle) recorded within the survey area less reliant on linear features for commuting. Evidence for the reliance of barbastelle on linear features is mixed, for example with radio-tracking surveys undertaken across the EDF Energy Estate⁷ (Ref. 7.44) at Sizewell, indicating the ability of barbastelle to commute and forage in the absence of linear features. Furthermore, the sections of hedgerow to be lost are at locations that are not likely to be a commuting route given their proximity to the busy A12.

⁷ Land owned by EDF Energy in the Sizewell area.

- 7.6.29 The degree of sensitivity bats display to habitat loss varies between species; however, the surrounding landscape is dominated by similar arable habitat. It is therefore considered likely that any bats affected by the loss of the arable habitat as a result of the proposed development would be able to use the extensive areas of similar arable habitat present across the Zol. The bat assemblage within the Zol would therefore have a low sensitivity to this impact.
- 7.6.30 The loss of arable land would be temporary and reversible, with the proposed development site returned to agricultural use once the need for the park and ride facility has ceased, and the land reinstated as a sub-optimal foraging resource for the bat assemblage.
- 7.6.31 Overall, the impact of habitat loss on the bat assemblage would have a minor adverse effect, which is considered to be **not significant**.

Disturbance from noise

- 7.6.32 The construction of the proposed development may result in an increase in noise within the site boundary and the local area. Noise disturbance may arise through construction activities (such as noise from construction plant), 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.
- 7.6.33 Primary mitigation measures, detailed in **section 7.5** of this chapter, include the presence of buffer areas between the proposed perimeter fence, and Little Nursery Wood and hedgerow, the presence of landscape bunds, security fencing, and installation of close-boarded fencing inside the security fencing where the site is adjacent to Little Nursery Wood. These measures would provide some attenuation of noise to retained habitats associated with foraging, commuting, and roosting bats.
- 7.6.34 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 Little Nursery Wood resulting in delayed emergence, or roost abandonment.
- 7.6.35 Anecdotal evidence, such as the use of Wolvercote Railway Tunnel by roosting bats (Ref. 7.45) despite the presence of an operating main line 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. 7.46), which may result

in the period of peak invertebrate activity (at or soon after dusk; Ref. 7.47) being missed, reducing the duration of potential foraging activity.

- 7.6.36 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. 7.48). 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 (Ref. 7.47).
- 7.6.37 Given the primary and tertiary mitigation measures to minimise noise, outlined in **Chapter 4** of this volume, and availability of alternative roosting and foraging habitat in the surrounding countryside, it is unlikely that bats would be appreciably displaced by construction activities. Activity levels demonstrate that bat species are not wholly reliant on the habitats within the site and the ZoI. It is therefore considered that bats would be able to use adjacent large areas of more suitable habitat present within the wider landscape. For these reasons, the bat assemblage is likely to have a low sensitivity to increases in noise levels.
- 7.6.38 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. The effect would be temporary, medium term (between 12–18 months) and reversible over time, once the source of noise is removed. This would result in a minor adverse effect, which is considered to be **not significant**.

Disturbance from light

- 7.6.39 Construction lighting of the proposed development would increase light levels and could cause light intrusion into nearby habitats. As described in **section 7.5** of this chapter under tertiary mitigation, construction lighting would minimise light spill and the potential for light disturbance on adjacent land. Primary mitigation also includes the establishment of buffers between the proposed development and Little Nursery Wood and hedgerows, and the installation of close-boarded fencing inside the security fence where the site is adjacent to Little Nursery Wood.
- 7.6.40 Bat species are known to be sensitive to the effects of light, but this varies with the type of lighting and the species under consideration. A substantial increase in light levels and light spillage over the current baseline could cause:
- disturbance to roosting bats in adjacent areas of woodland including delayed emergence, or roost abandonment (Ref. 7.49); and

- impacts to foraging and commuting bats, due to aversion to lit areas (Ref. 7.49), or effects on prey behaviour and availability (Ref. 7.46, Ref. 7.48).

7.6.41 The type of lighting has also been shown to impact the degree to which bats are affected by artificial lighting (Ref. 7.50, Ref. 7.39). Invertebrate species are highly attracted to ultraviolet, green and blue light (light with short wavelengths and high frequencies) which can result in increased insect numbers around artificial light sources (Ref. 7.47). 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 brown long-eared bats, which are recorded within the site, generally avoid well-lit areas (Ref. 7.49), and are therefore more sensitive to an increase in light levels. Additionally, some studies suggest that streetlights might negatively affect moths (the preferred prey of barbastelle) (Ref. 7.51). 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.

7.6.42 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 footprint of the proposed development (including hedgerows), and due to the primary and tertiary mitigation, light spillage into the surrounding habitats (including Little Nursery Wood) would be minimised. This would result in a low magnitude of impact which would be medium-term, relating to specific requirements for lighting during the 12–18 months construction period, and reversible over time, once the source of lighting is removed. This is considered to result in a minor adverse effect, which is considered to be **not significant**.

iii. Inter-relationship effects

7.6.43 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.

7.6.44 This section considers the potential for inter-relationship effects on terrestrial ecology and ornithology IEFs that could occur as a result of a combination of individual environmental effects.

7.6.45 The potential impacts on the great crested newt meta-population, and 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

7.6.46 During the operational phase, the impact pathways would be associated with:

- habitat fragmentation (including connectivity);
- incidental mortality;
- disturbance effects on species population (comprising light, noise and visual effects); and
- changes in water quality.

7.6.47 A number of the operational impact pathways have been scoped out of this assessment, given the primary and tertiary mitigation detailed in **section 7.5** of this chapter, or where it is considered that the magnitude of the impact would be small, resulting in a non-significant effect. The operational impact pathways that have been scoped out of this assessment, along with the rationale for scoping out, are as follows:

- effects of changes in water quality on great crested newts: given the primary and tertiary mitigation outlined in **section 7.5** of this chapter, it is not considered likely that there would be an impact to the water quality of ponds within the Zol. This impact pathway has therefore been scoped out of the assessment;
- effect of habitat fragmentation on great crested newts: as part of the primary mitigation, two small pipes or culverts would be placed beneath the new access road to allow the passage of great crested newts underneath the new road, and great crested newts would be directed to these through the placement of one-way directional newt fencing. Further detailed design will be provided in the great crested newt draft protected species licence and subject to agreement with Natural England. This would allow great crested newts from Ponds 78 to 82 and 101 to access Little Nursery Wood for foraging and hibernation. This impact pathway has therefore been scoped out of the assessment;
- incidental mortality to great crested newts: as part of the primary mitigation, one-way directional newt fencing would be placed around the perimeter of the car parking areas, swales and landscape bunds to prevent newts from entering the site. In addition, one-way directional newt fencing would guide newts to new culverts allowing them safe passage under the road (avoiding vehicle contact). This impact pathway has therefore been scoped out of the assessment; and

- incidental mortality to bat species: during the operational phase, vehicles accessing the car park would be travelling at low speeds within the site boundary. Additionally, the noise and lighting generated by the proposed development would dissuade bats from the area. Therefore, the expected collision rate between bats and vehicles within the parking area is expected to be minimal. The construction of Sizewell C Project would result in a greater number of vehicles travelling down the A12 which could lead to an increase in bat collisions; however, it would be expected that the bats within the Zol of the site would have already habituated to the existing trunk road to some degree. This impact pathway has therefore been scoped out of the assessment.

7.6.48 Further detail of the specific anticipated impacts on the identified IEFs have been provided in the subsequent sections.

i. **Important Ecological Feature: Great crested newt**

7.6.49 During operation, no impact pathways experienced by great crested newts have been identified given the primary and tertiary mitigation measures.

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

7.6.50 During the operational phase, the impacts on the bat assemblage would be associated with:

- disturbance from noise; and
- disturbance from light.

7.6.51 The characterisation of the impacts of the activities is described in detail in the subsequent sections.

Disturbance from noise

7.6.52 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 bus 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 of 01:00 to 05:00 represent the period when bats are less active. However, activity levels during this period are likely to increase

during the height of summer when the overall length of night-time hours is reduced.

- 7.6.53 It is anticipated that operational noise levels would be mostly lower than those associated with construction, see **Chapter 4** of this volume for details. As outlined in **section 7.5** of this chapter, primary mitigation measures (including landscape bunds, security and close-boarded fencing) would reduce the effect of operational noise levels on adjacent habitats and their associated species as far as practicable.
- 7.6.54 Although bats can be impacted by noise, the level of bat activity recorded during surveys of the site was low, and the habitats present on-site are largely sub-optimal. The bat assemblage, of low sensitivity, within the Zol is therefore not considered to be reliant on this on-site habitat for foraging.
- 7.6.55 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 of the site, resulting in a very low magnitude of impact. The impact would be temporary but long-term (as operation is expected to last up to 12 years), and reversible over time, once the operational phase is complete. This would result in a minor adverse effect, which is considered to be **not significant**.

Disturbance from light

- 7.6.56 The operation of the proposed development would result in an increase in light intrusion due to the operational lighting. Lighting would be provided along the security fence of the proposed development, as well as within the car parking area in accordance with the indicative lighting plan for the site. Light fixtures would be mounted at 6m height within the parking area and access road and consist largely of LED lights (Ref. 7.39). The lighting on the proposed roundabout would be designed in accordance with highway standards. Primary embedded mitigation (for example, use of light fittings chosen to limit stray light, see **section 7.5** of this chapter) would aim to reduce the lateral 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 Little Nursery Wood from the headlights of vehicles using the proposed development.
- 7.6.57 The operational lighting would be in place for the operational period of the proposed development, approximately a 9–12year period. During operation, lighting would be provided within the site in accordance with the indicative lighting plan, for security and safety reasons. This lighting would be operational at night when bats are active. Lighting plans for the operation of the proposed development show no anticipated light spill above 1.0 lux

outside of the development zone into the buffer area with Little Nursery Wood, with lighting levels at 0.1 lux, or lower along the eastern edge of Little Nursery Wood. There would be an anticipated light spill of between 1.0 and 5.0 lux along the eastern boundary of the site in parts closest to the A12. Along the new access road, which would traverse an undeveloped part of the site, maximum lighting levels would reach 10 lux. However, these calculations are for the fixed lighting only, and do not consider the headlights of vehicles using the proposed development.

7.6.58 Lighting can affect bats in number of ways, and some bat species are regarded as highly sensitive to light disturbance. The increase in lighting (from fixed lighting and vehicle headlights) compared to existing levels, would be restricted to the proposed development and adjacent habitats.

7.6.59 Lighting can act as a deterrent to bats but only a relatively small number of bats have been recorded within the site. Bats using the site are not likely to be dependent on the sub-optimal habitats present within the site, and would also be using a range of additional habitats in the Zol. This includes the more valuable Little Nursery Wood, adjacent to the site boundary. The bat assemblage, of low sensitivity, within the Zol is therefore not considered to be reliant on this on-site habitat for foraging.

7.6.60 Overall, fixed lighting would have a very low magnitude of impact on the bat assemblage, resulting in a minor adverse effect, which is considered to be **not significant**. Vehicle lights would have a low magnitude of impact on the bat assemblage, resulting in a minor adverse effect, which is considered to be **not significant**. 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 reinstated to agricultural use.

iii. Inter-relationship effects

7.6.61 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.

7.6.62 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.

7.6.63 No operational impacts on great crested newts were identified, as such there would be no inter-relationship effects.

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

d) Removal and reinstatement

7.6.65 During removal and reinstatement, the potential impacts experienced by IEFs would be similar to those experienced during construction. As for construction, a number of impact pathways have been scoped out; these are the same impacts as those described previously.

7.6.66 A number of the removal and reinstatement impact pathways have been scoped out of this assessment, due to the primary and tertiary mitigation outlined in **section 7.5** of this chapter, or where it is considered that the magnitude of the impact would be small, resulting in a non-significant effect. In addition to the impact pathways scoped out for construction, the following impact pathway has been scoped out of this assessment for the removal and reinstatement phase, along with the rationale for scoping out, as follows:

- incidental mortality to great crested newts: the embedded primary and tertiary mitigation, great crested newts would already have been excluded from the majority of the site (namely the car parking areas, swales and earth bunds) during the construction and operational phases. During the removal and reinstatement phase, and until the great crested newt exclusion fencing is removed at the end of the phase, there would be no great crested newts within these parts of the site where the majority of removal and reinstatement works shall take place. This impact pathway has therefore been scoped out of the assessment.

7.6.67 Further detail of the anticipated impacts on the IEFs have been provided in the subsequent sections.

i. Important Ecological Feature: Great crested newt

Habitat loss and habitat fragmentation

7.6.68 During removal and reinstatement, buildings and infrastructure would be removed, including the site drainage, landscape bunds, temporary planting and any hard standing. Once the site has been cleared, the area would be returned to agricultural use.

7.6.69 As outlined in **section 7.5**, one-way directional newt fencing installed during the construction phase, and maintained during operation would prevent great crested newts from colonising the on-site swales and infiltration ponds and these features would remain free from great crested newt populations. The removal of the drainage infrastructure would, therefore, have no impact on the great crested newt population within the Zol.

7.6.70 By reinstating the land to agricultural use, the connectivity of habitats would be re-established. This would restore the newts' ability to move between breeding, foraging and hibernation sites.

7.6.71 The removal of the proposed development and reinstatement of the land to agricultural use, would have a permanent, neutral effect, which is considered to be **not significant**.

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

7.6.72 During the removal and reinstatement phase, the area would be returned to agricultural use. Temporary planting within the site would be removed; hedgerows along the access route would be removed and reinstated along the original hedgerow lines where practicable.

7.6.73 The 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**.

7.6.74 As habitat would be reinstated to agricultural use, and all hardstanding removed, this would have a permanent, neutral effect, which is considered to be **not significant**.

iii. **Inter-relationship effects**

7.6.75 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.

7.6.76 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 during the removal and reinstatement of the proposed development.

7.6.77 Overall, the great crested newt population would experience a neutral, **not significant** effect from the habitat reinstatement. Therefore, there would be no additional inter-relationship effects on great crested newts during the removal and reinstatement phase.

7.6.78 The potential impacts on the bat assemblage during removal and reinstatement have been assessed as **not significant**, and even in combination 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 detailed in **section 7.5** of this chapter. 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 The section describes the 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. A suitably experienced EcoW would also oversee all ground-breaking activities.

7.7.4 During construction, there would be regular checks of the security fence, ecological fencing and close-boarded fence to check these remain intact, and that there is no encroachment of construction activities beyond the site boundary or into the buffer areas. The newt culverts, when installed, would also be monitored to ensure these remain intact and clear of debris. This would also include checks that badgers remain excluded from the site and the landscape bunds. Should badgers have gained access and created setts within the site, this would allow time for a licence to close these setts to be obtained from Natural England in advance of the removal and reinstatement phase.

7.7.5 The one-way directional newt fencing would be checked regularly to ensure that this remains intact.

7.7.6 There would be regular checks of construction lighting to monitor and correct for any excessive light spill into the surrounding habitats, and particularly into the adjacent Little Nursery Wood.

ii. Operation

- 7.7.7 Throughout the operational phase, regular monitoring of the one-way directional newt fencing and newt culverts would be conducted to ensure that these remain intact and clear of debris. This would ensure the continued exclusion of newts from the operational facility on the site.
- 7.7.8 Throughout the operational phase, regular monitoring of the security fence, badger fence and close-boarded fence would be conducted to ensure that this remains intact, and that badgers remain excluded from the site and the landscape bunds. Should badgers gain access and establish setts within the operational site, a licence from Natural England would be obtained to close these setts in advance of the site removal and restoration phase. An ecological watching brief of the landscape bunds to monitor for any signs of badger activity is also proposed.
- 7.7.9 There would be regular operational checks of lighting to monitor and correct for any excessive light spill into the surrounding habitats and in particular into the adjacent Little Nursery Wood.
- 7.7.10 There would be regular checks of Little Nursery Wood to monitor for human incursion and littering.

iii. Removal and reinstatement

- 7.7.11 Monitoring during the removal and reinstatement phase would be in accordance with that described for construction.

7.8 Residual effects

- 7.8.1 The following tables (**Table 7.13**, **Table 7.14**, and **Table 7.15**) 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 7.13: 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.
Great crested newt.	Habitat loss.	<ul style="list-style-type: none"> Retain Little Nursery Wood with a 20m buffer. Retain Pond 78, protect with 3m high landscape bund and 10m buffer between the pond and the construction of the operational park and ride facility. Allow development of tussocky grassland and scrub around Pond 78, create hibernation features. Planting of hedgerow along Willow Marsh Lane. Development of unmanaged grassland margin adjacent and along the eastern and western site boundaries, and the east and north of the landscape bund, connecting to Pond 78 to 82, and Little Nursery Wood. 	Minor adverse (not significant).	None required.	Minor adverse (not significant).
	Habitat fragmentation.	<ul style="list-style-type: none"> Two small pipes or culverts beneath new access road to allow safe passage of great crested newts. Planting of hedgerow along Willow Marsh Lane. Development of unmanaged grassland margin adjacent and along the eastern and western site boundaries, and the east and north of the topsoil bund, connecting to Pond 78 to 82, and Little Nursery Wood. 	Minor adverse (not significant).	No additional mitigation required. Monitoring of pipes/culverts and newt fencing.	Minor adverse (not significant).
	Incidental mortality.	<ul style="list-style-type: none"> Retain Pond 78, protect with 3m high landscape bund and 10m buffer between the pond and the construction of the operational park and ride facility. Two small pipes or culverts beneath new access road to allow safe passage of great crested newts, 	Negligible adverse (not significant).	No additional mitigation required. A suitably qualified ecologist would oversee all ground-breaking	Negligible adverse (not significant).

NOT PROTECTIVELY MARKED

Receptor	Impact	Primary or Tertiary Mitigation.	Classification of Effect.	Additional Mitigation.	Residual Effect.
		<p>further detailed design of these pipes or culverts will be provided in the great crested newt draft protected species licence and subject to agreement with Natural England.</p> <ul style="list-style-type: none"> • One-way directional newt fencing to exclude newts from the construction of the operational park and ride facility and guide to culverts. • Consideration of species seasonal constraints during phased vegetation clearance and fencing installation. 		<p>activities.</p> <p>Monitoring of pipes/culverts and newt fencing.</p>	
Bat assemblage.	Habitat loss.	<ul style="list-style-type: none"> • Retain Little Nursery Wood with 20m buffer. 	Minor adverse (not significant).	None required.	Minor adverse (not significant).
	Disturbance from noise.	<ul style="list-style-type: none"> • Retain Little Nursery Wood with 20m buffer. • Close-boarded fencing along the inside of the security fence where the site is adjacent to Little Nursery Wood. 	Minor adverse (not significant).	<p>No additional mitigation required.</p> <p>Regular checks of close-board fencing and construction lighting.</p>	Minor adverse (not significant).
	Disturbance from light.	<ul style="list-style-type: none"> • 20m buffer between proposed development and Little Nursery Wood. • Control of temporary lighting to minimise light spill. • Close-boarded fencing along the inside of the security fence where the site is adjacent to Little Nursery Wood. 	Minor adverse (not significant).	<p>Regular checks of Little Nursery Wood to monitor for human incursion.</p>	Minor adverse (not significant).

Table 7.14: 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.
Great crested newt.	During operation, no impact pathways experienced by this IEF have been identified due to the embedded primary and tertiary mitigation.				
Bat assemblage.	Disturbance from noise.	<ul style="list-style-type: none"> Retain Little Nursery Wood with 20m buffer. Close-boarded fencing along the inside of the security fence where the site is adjacent to Little Nursery Wood. 	Minor adverse (not significant).	No additional mitigation required. Regular checks of close-board fencing and operational lighting.	Minor adverse (not significant).
	Disturbance from light.	<ul style="list-style-type: none"> 20m buffer between proposed development and Little Nursery Wood. Close-boarded fencing along the inside of the security fence where the site is adjacent to Little Nursery Wood. Operational lighting levels would not exceed 0.1lux along the eastern side of Little Nursery Wood (excluding vehicle headlights). 	Minor adverse (not significant).	Regular checks of Little Nursery Wood to monitor for human incursion.	Minor adverse (not significant).

Table 7.15: 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.
Great crested newt.	Habitat loss and fragmentation.	<ul style="list-style-type: none"> One-way directional newt fencing to exclude newts from the site (including swales) removed at end of removal and reinstatement phase. Return of habitat to original use. Retain new hedgerow planted along Willow Marsh 	Neutral (not significant).	None required. Monitoring inline construction above.	Negligible (not significant).

NOT PROTECTIVELY MARKED

Receptor	Impact	Primary or Tertiary Mitigation.	Classification of Effect.	Additional Mitigation.	Residual Effect.
		Lane.			
Bat assemblage.	Habitat loss.	<ul style="list-style-type: none"> • Hard standing removed, land returned to agricultural use. 	Neutral (not significant) .	None required. Monitoring inline construction above.	Neutral (not significant) .
	Disturbance from noise.	<ul style="list-style-type: none"> • Retain Little Nursery Wood with 20m buffer. 	Minor adverse (not significant) .		Minor adverse (not significant) .
	Disturbance from light.	<ul style="list-style-type: none"> • 20m buffer between proposed development and Little Nursery Wood. • Control of temporary lighting to minimise light spill. • Close-boarded fencing along the inside of the security fence where the site is adjacent to Little Nursery Wood removed at end of removal and reinstatement phase. 	Minor adverse (not significant) .		Minor adverse (not significant) .

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/ukxi/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 (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.
- 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 S. Bullion. 2009. *The Mammals of Suffolk*. Suffolk Wildlife Trust.
- 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 T. Beebee, & R. Griffiths. 2000. The New Naturalist. Amphibians and Reptiles. Harper Collins.
- 7.41 Natural England. 2015. Great crested newts: surveys and mitigation for development projects. Available online from: <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects> (Accessed 7 February 2019).
- 7.42 T. Langton, C. Beckett, and J. Foster. 2001. Great Crested Newt Conservation Handbook. Froglife.
- 7.43 J. Collins (ed.). 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. London: The Bat Conservation Trust.
- 7.44 Corylus Ecology. Sizewell Radio-tracking. 2016. Unpublished report to EDF Energy on behalf of Arcadis.
- 7.45 Greena Ecological Consultancy. Wolvercote Railway Tunnel. Date Unknown. (Online) Available from: http://www.bats.org.uk/data/files/Wolvercote_Tunnel_Geoff_Billington.pdf (Accessed 19 September 2016).
- 7.46 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.
- 7.47 Bat Conservation Trust. 2008. Bat and Lighting in the UK. Bats and the Built Environment Series. Bat Conservation Trust.
- 7.48 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.
- 7.49 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>
- 7.50 Bat Conservation Trust. 2014. Artificial Lighting and Wildlife Interim Guidance: Recommendations to help minimise the impact of artificial lighting.
- 7.51 Siervo & R. Arlettaz. 1997. Barbastelle bats (*Barbastelle* spp.) specialize in the predation of moths: implications for foraging tactics and conservation. Acta Oecologica, 18 (2): 91–106.