



Tween Bridge Solar Farm

A Nationally Significant Infrastructure Project in the Energy Sector

Preliminary Environmental Information Report

Chapter 7 – Ecology and Nature Conservation

October 2023



Visit: www.tweenbridgesolar.co.uk
Email: info@tweenbridgesolar.co.uk

7. Ecology and Nature Conservation

17.1. Introduction

17.1.1. The Ecology and Nature Conservation chapter of the PEIR sets out the baseline information available at the time of writing and provides a preliminary assessment of the likely effects of the Proposed Development on ecological features during its construction, operation and decommissioning phases. The PEIR will be updated as further assessments become available and any updated to the baseline will be reported in the next iteration of the PEIR which will be presented as part of the statutory pre-application consultation. Responses from consultees that engaged to date and the Scoping opinion issued by the Planning Inspectorate on 14 March 2023 have been taken into account during the preparation of this chapter and this is discussed in detail below.

17.1.2. The assessment has been carried out by suitably qualified ecologists at Avian Ecology Ltd.

17.1.3. This chapter is supported by the following appendices: -

- **Appendix 7.1** – Baseline Habitats Report
- **Appendix 7.2** – Breeding Bird Survey Report
- **Appendix 7.3** – Non-breeding Bird Survey Report
- **Appendix 7.4** – Nightjar Survey Reports
- **Appendix 7.5** – Confidential Report – Badger Survey Report [*Circulation of Report is Restricted*]
- **Appendix 7.6** – Confidential Report – Otter and Water Vole Survey Report [*Circulation of Report is Restricted*]
- **Appendix 7.7** – Great Crested Newt Presence/Absence (eDNA) Survey Report
- **Appendix 7.8** – Natural England Request for Discretionary Advice Note

17.1.4. Figures are provided within the relevant Technical Appendices (TA);

Appendix 7.1 – Baseline Habitats Report

- Figure 1 – Site Location Plan
- Figure 2 – Statutory Designated Sites Plan
- Figure 3 – Non-statutory Designated Sites Plan
- Figure 4A–4G – Habitat maps;
- Figure 5 – Pond Location Plan

Appendix 7.2 – Breeding Bird Survey Report

- Figure 1 –Breeding Bird Survey Plan (Overview)
- Figure 2 – Breeding Bird Survey Results – Area 1 & 1a
- Figure 3 – Breeding Bird Survey Results – Area 2 & 2a
- Figure 4 – Breeding Bird Survey Results – Area 3
- Figure 5 – Breeding Bird Survey Results – Area 4 & 4a
- Figure 6 – Breeding Bird Survey Results – Area 5
- Figure 7 – Breeding Bird Survey Results – Area 6 & 6a
- Figure 8 – Breeding Bird Survey Results – Area 7 & 7a
- Figure 9 – Breeding Bird Survey Results – Area 8 & 8a
- Figure 10 – Breeding Bird Survey Results – Area 9
- Figure 11 – Confidential Schedule 1 Species Survey Results (provided separately)

Appendix 7.3 – Non-breeding Bird Survey Report

- Figure 1 –Non-Breeding Bird Survey Field Plan (Overview)
- Figure 2 – Non-Breeding Bird Survey Field Plans – 1
- Figure 3 – Non-Breeding Bird Survey Field Plans – 2
- Figure 4 – Non-Breeding Bird Survey Field Plans – 3
- Figure 5 – Non-Breeding Bird Survey Field Plans – 4
- Figure 6 – Non-Breeding Bird Survey Field Plans – 5
- Figure 7 – Non-Breeding Bird Survey Field Plans – 6
- Figure 8 – Non-Breeding Bird Survey Field Plans – 7
- Figure 9 – Non-Breeding SPA Bird Survey Results – Pink Footed Goose
- Figure 10 – Non-Breeding SPA Bird Survey Results – Teal
- Figure 11 – Non-Breeding SPA Bird Survey Results – Lapwing
- Figure 12 – Non-Breeding SPA Bird Survey Results – Golden Plover, Grey Plover and Curlew
- Figure 13 – Non-Breeding SPA Bird Survey Results – Marsh Harrier and Hen Harrier

Appendix 7.4 – Nightjar Survey Reports

- Figure (Drawing) 1 – Site Location Plan
- Figure (Drawing) 2 – Churring Nightjar Location Map

Appendix 7.5 – Confidential Report – Badger Survey Report **[Circulation of Report is Restricted]**

- Figure 1 – Confidential Badger Plan

Appendix 7.6 – Confidential Report – Otter and Water Vole Survey Report **[Circulation of Report is Restricted]**

- Figure 1 – Otter and Water Vole Survey Plan
- Figure 2 – Otter Field Survey Results
- Figure 3 – Water Vol Field Survey Results

Appendix 7.7 – Great Crested Newt Presence/Absence (eDNA) Survey Report

- Figure 1 – Pond Location Plan – Overview
- Figure 2 – Pond Location Plan – Map 1
- Figure 3 – Pond Location Plan – Map 2
- Figure 4 – Pond Location Plan – Map 3
- Figure 5 – Pond Location Plan – Map 4

Appendix 7.8 – Natural England Request for Discretionary Advice Note

- Figure 1 – Site Location Plan
- Figure 2 – Winter Bird Survey Area

17.1.5. Baseline and assessment work is ongoing, it is anticipated that the following information will be made available for the next iteration of the PEIR: –

- Consideration of Cumulative Impacts
- Preparation of a Landscape and Ecological Management Plan
- Detailed design parameters of the Scheme,
- Detailed assessment of Scheme, including assessment of directional drilling under canal.
- Detailed habitat survey including 'UKHab' condition assessments

- Non-breeding/winter (Year 2) bird surveys commencing September 2023 and due to continue until March 2024 (with a minor area not previously surveyed)
- Second visit of a water vole and otter survey
- Invertebrate scoping survey
- Preparation of a Construction Environment Management Plan for Biodiversity
- Information to Inform a Habitat Regulation Assessment report
- Biodiversity Net Gain Calculation

17.2. Consultation

- 17.2.1. The proposed scope of works were submitted for comments as part of the applicant’s Environmental Impact Assessment Scoping Report (Technical Appendix 1.2). A summary of the relevant matters raised by the Scoping Opinion (Technical Appendix 1.1) is included in Table 7.6 below.
- 17.2.2. A meeting was carried out on the 13th July 2023 between Doncaster Council Local Planning Authority (LPA) and Avian Ecology Ltd. A summary of consultation responses received to date is provided in Table 7.1 along with information on how these are being addressed by the Applicant in relation to Ecology and Nature Conservation.
- 17.2.3. A request to consult with Natural England through their Discretionary Advice Service (DAS) was submitted on the 11th July 2023 and a response was received on 6th September 2023. The note to accompany this request can be seen in **Appendix 7.8**.
- 17.2.4. A summary of consultation responses received to date is provided in **Table 7.1; Summary of Consultation** along with information on how these are being addressed by the Applicant in relation to Ecology and Nature Conservation.

Table 7.1 Summary of Consultation

CONSULTEE	SUMMARY OF CONSULTEE RESPONSE	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT
Doncaster Council LPA	Nightjars Lighting within solar farm will need to be addressed within the CEMP. Assessment should look at research relating to solar farms and nightjars. In addition, research has been done on the populations of nightjar on Thorne and Hatfield Moors which looks at the usage of the Draft Order Limits and the wider area by the species	An assessment on the likely significant effects on nightjar will be undertaken. This will utilise data gathered as part of wind farm monitoring (Appendix 7.4) as well as data gathered through a literature based review. This assessment will be included within the next iteration of the PEIR. This will look at potential impact pathways including lighting and noise.

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	and this should be utilised in the assessment.	
Doncaster Council LPA	<p>Invertebrates Is there an impact on invertebrates with the reflective nature of the panels and perception that its water. They raised concerns with The Scheme being so large and presence of aquatic invertebrates.</p>	An assessment on the likely significant effect on invertebrates will be included within the next iteration of the PEIR.
Doncaster Council LPA	<p>Water quality Will monitoring of the water quality be undertaken as part of The Scheme</p>	Further details of this will be provided in the next iteration of the PEIR.
Doncaster Council LPA	<p>Best and most versatile land Is there any best and most versatile land within the Draft Order Limits</p>	A semi-detailed Agricultural Land Classification (ALC) survey is currently underway. Part of the Draft Order Limits has been surveyed but very dry conditions and crop growth have delayed fieldwork. The early indications are that the land will classify as a mixture of grades, but mostly grades 2, 3a and 3b. Full details of the ALC survey will be provided in Chapter 15; Agriculture as well as the next iteration of the PEIR .
Doncaster Council LPA	<p>Skylarks Raised concerns of the likely significant effects on this species. As part of a mitigation strategy, they would be looking for evidence of skylark plot implementation and benefits to skylark through this. Also, evidence of implementation of a mitigation strategy for perpetuity.</p>	An assessment on the likely significant effect on ground nesting species including skylark will be included within the second PEIR iteration and in the subsequent ES. Points raised will also be addressed within a mitigation strategy as mentioned within this draft PEIR (section 7.5.67).
Doncaster Council LPA	<p>Mammal connectivity How will connectivity be maintained for small mammals in the Draft Order Limits and in the wider area.</p>	Mammal gates will be adopted and these will be micro sited along corridors and mammal pathways. There is reference to these within the PEIR (section 7.5.44) and this will also be further explained in the subsequent ES, Construction Environmental Management Plan

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		(CEMP) and Landscape Ecology Management Plan (LEMP).
Doncaster Council LPA	Other priority mammals Deer have a part to play within the ecological network and are present in the area.	It is understood that roe deer are a Local Biodiversity Action Plan (LBAP) species, and these are considered within the assessment on the likely significant effect on other priority mammals within this PEIR (section 7.5.44) and will be further considered in the next iteration of the PEIR.
Doncaster Council LPA	Hibernacula Will hibernacula be installed to provide additional habitat provision for amphibians and reptiles	These have been referenced within the PEIR (section 7.5.69) and will be further considered within the Landscape mitigation proposals, LEMP and next iteration of the PEIR.
Doncaster Council LPA	Peat & carbon sequestration Will an assessment be undertaken on peat soils and also the impact of The Scheme on carbon sequestration.	Further details of this will be provided in the next iteration of the PEIR including Chapter 9; Ground Conditions.
Doncaster Council LPA	Importance of open areas for wintering birds. Council stressed the importance of open arable.	An assessment on the likely significant effect on non-breeding birds is included within this PEIR (section 7.4.155), with further assessment provided within the next iteration of the PEIR.
Doncaster Council LPA	Habitat enhancements There is an opportunity for landscape scale habitat creation.	The applicant agrees that the Scheme presents an excellent opportunity to deliver habitat creation. A landscape strategy will be produced which will contribute to a minimum of 10% Biodiversity Net Gain (BNG) and will benefit a range of species, both within the Draft Order Limits and wider area.
Natural England (Discretionary Advice 6 th September 2023)	Non-breeding bird surveys Requested additional surveys 2022 – 2023 to determine potential for impacts on the Humber Estuary Special Protection Area (SPA). NE state that surveys should include Vantage Point (VP) surveys and	Additional surveys commented September 2023 and will complete in March 2024. Clarification on the VP survey methodology requested from NE. Increased nocturnal survey effort to be undertaken.

	increased nocturnal surveys to that completed in Year 1 .	
Natural England (Discretionary Advice 6 th September 2023)	Nightjar NE requested that the assessment considers the potential for impacts on foraging nightjars during the construction and operational phases of the Scheme.	An assessment on the likely significant effects on nightjars will be included within the second iteration of the PEIR and the ES.

17.3. Assessment Approach

Methodology

- 17.3.1. The assessment presented within this draft chapter has been undertaken with reference to applicable wildlife and countryside legislation, national and local planning policy and the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) guidance¹ (hereafter ‘the CIEEM guidelines’). The assessment methodology also reflects the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the ‘EIA Regulations’) and focuses on those activities that could potentially generate significant effects on ecological and ornithological features.
- 17.3.2. Ecological Impact Assessment (EclA) is defined within the CIEEM guidelines as
‘...a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems’.
- 17.3.3. The assessment presented within this chapter and associated technical appendices therefore includes:
- A description of baseline ecological and ornithological conditions;
 - An evaluation of identified important ecological and ornithological features;
 - A description and evaluation of the potential effects of the Scheme;
 - Mitigation measures implemented to address any identified significant adverse effects;
 - An assessment of cumulative effects;

¹ CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (version 1.1). Chartered Institute of Ecology and Environmental Management, Winchester.

- Identification of any residual effects after mitigation; and,
- Identification of opportunities for biodiversity enhancement.

17.3.4. For the purpose of the assessment, the terms 'impacts' and 'effects' are referred to in accordance with the definitions set out in CIEEM guidance as follows:

- **Impact:** Actions resulting in changes to an ecological feature, for example, removing a hedgerow; and
- **Effect:** Outcome to an ecological feature from an impact, for example, the changes experienced by the local population of a species arising from the loss of the hedgerow.

Assessment of Significance

17.3.5. The EIA Regulations require the the PEIR to include information that *'is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development) (Regulation 12(2)(b)).*

17.3.6. To determine the overall significance of each ecological effect, judgements on the sensitivity of the receptor(s) and the magnitude of impact from The Scheme are considered together in order to determine whether or not an effect is likely to be significant. This involves a combination of quantitative and qualitative assessment and the application of professional judgement.

17.3.7. For the purposes of the PEIR, effects will be categorised as 'significant' or 'not significant', in line with the EIA Regulations. The assessment considers effects at different geographic scales i.e. where effects may be discernible at a local scale but are not considered significant in the context of the EIA Regulations. For the purpose of the assessment, moderate and major effects are deemed to be 'significant' in EIA terms unless stated otherwise.

17.3.8. A 'significant effect' is considered to be one that either supports or undermines biodiversity conservation objectives for 'important ecological features', or for biodiversity in general.

17.3.9. The CIEEM guidelines on ecological impact assessment note that:

'A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.'

17.3.10. For ease of reference, **Table 7.2** sets out the adapted CIEEM terminology, which also shows the equivalent EIA terms to be used in this Ecology & Nature Conservation Chapter.

Table 7.2: Summary of Significance Levels

Effect (Standard EIA-related terminology and associated assigned significance)		Equivalent CIEEM terminology adapted for Ecological Assessment
Negligible	Neutral	No discernible or significant on ecological integrity or conservation status (e.g. species or habitat).

Minor–Moderate Adverse	Not Significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate–Major Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.

17.3.11. The Scheme has been assessed as having an operational lifespan of up to 40 years for the purpose of the assessment. Ecological effects will be described in terms of their duration as short, medium term and long-term as follows:

- Short term effects are defined as a period of months, up to one year;
- Medium term effects are defined as a more than one year, up to five years; and,
- Long term effects are defined as > 5 years.

17.3.12. For the purposes of the assessment the importance or sensitivity of an ecological feature will be considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table 7.3**.

Table 7.3: Value/Sensitivity Assessment

Value or Sensitivity of Receptor/ Geographic Scale of Importance	Definition Examples
High – International / European	Greater than a UK scale, typically valued at a European level such as internationally designated sites (Special Protection Areas (SPA), Special Areas of Conservation (SAC) and/ or Ramsar sites) or proposed/candidate site (pSPA or cSAC), Large area of a habitats listed in Annex I of the Habitats Directive ² or smaller areas of such habitat which are essential to maintain the viability of the larger whole, large population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) or species listed in Annex IV of the Habitats Directive.

² EC (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. EC, Brussels

<p>High – National (England/UK)</p>	<p>England/UK: A nationally designated site (e.g. Site of Special Scientific Interest) or a discrete area which meets the selection criteria for national designation.</p> <p>An area of a priority habitat listed under the Section 31 of the Natural Environment and Rural Communities Act 2006 (NERC) which constitutes a significant proportion of the resource of that habitat in England or the UK as a whole.</p> <p>A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / Biodiversity List and priority species listed under the Section 31 of the NERC Act 2006, and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p>
<p>Medium – Regional / County</p>	<p>Locally designated sites (Local Nature Reserves, County or Local Wildlife Sites).</p> <p>Areas of priority habitat, which constitute a significant proportion of the County’s resource of that habitat.</p> <p>A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / priority species and priority species listed under Section 31 of the NERC Act 2006, and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p>
<p>Low – Local</p>	<p>Local area around the Draft Order Limits.</p> <p>For example, areas of priority habitat which are not large enough to meet the criteria for County value, or small but sustainable populations of a protected or notable species.</p>
<p>Low/Negligible – Site</p>	<p>Within the Draft Order Limits. Features present but of value in relation to the Draft Order Limits only.</p>

17.3.13. Effects on ecological features will be assessed based upon the interaction between the importance, or sensitivity, of the feature and the magnitude of change it is likely to experience. In accordance with the CIEEM guidelines (2018), an EclA need only assess in detail, impacts upon important ecological features i.e. those that are considered important and potentially affected. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable. Where ecological features are not considered important enough to warrant further consideration, or where they will not be significantly affected, these are scoped out of the assessment process, and justification for exclusion is provided.

17.3.14. Relevant European, national and local guidance from governments and specialist organisations will be referred to in order to determine the importance (or 'sensitivity') of ecological features.

Importance will also be determined using professional judgement and taking account of the results of baseline surveys and the functional role of features within the context of the geographical area.

- 17.3.15. Importance does not necessarily relate solely to the level of legal protection that a feature receives, and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.
- 17.3.16. Once identified, potential impacts are described making reference to the following characteristics as appropriate: positive or negative, extent, magnitude, duration, timing, frequency, and, reversibility. The judgements on magnitude may need to be adjusted (either up or down) to reflect the duration of the change (i.e. short, medium or long term) and whether it is potentially reversible. The assessment also identifies areas where no change is anticipated and the resulting effect is described as 'not discernible' or 'none'.
- 17.3.17. Ecological effects are described as far as possible and where available information allows in terms of the parameters detailed in **Table 7.4**.
- 17.3.18. Magnitude of effect, based on the effects that The Scheme would have upon the resource/receptor, is considered within the range of high, medium, low, negligible. Consideration is given to scale, duration of impact/effect (and extent of The Scheme with reference to the definitions in **Table 7.3**). The assessment will consider how existing baseline conditions may change over time, as for example the baseline conditions could alter through operational land use, in the form of differing management and natural growth or succession of habitats.

Table 7.4: Environmental Parameters

Environmental Parameters	Description
Magnitude	The 'size' or amount of the effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an effect occurs. The magnitude and extent of an effect may be synonymous
Duration	The time over which an effect is expected to last prior to the recovery or replacement of the ecological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration may be longer than the duration of an activity.
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery, or mitigation allows recovery within a reasonable timescale.

	Permanent effects are those which cannot be recreated within the proposed development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

17.3.19. The assessment of effects is based upon the assessments of magnitude of effects and sensitivity of the resource/receptor to come to a professional judgement of how important this effect is. The magnitude of change effected on ecological receptors is described as set out in **Table 7.5**. The likelihood or probability that an effect will occur is addressed as far as possible based on available information. Whilst it is reasonably straightforward to identify effects that are certain to occur, or conversely will not occur, it is generally more difficult to assign a quantified level to occurrences defined as likely, unlikely or highly unlikely. In these circumstances, professional judgement has been used, with reasoning supported by available evidence.

Table 7.5 Magnitude of Effect

Magnitude	Criteria
High	The change may negatively or positively affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function, that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Moderate	Conservation status of a site or species population will not be negatively or positively affected, but some element of the functioning of the site or population might be affected and the change to the site/ population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor negative or positive change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

17.3.20. For an effect to be significant, the ecological integrity or conservation status of a sensitive feature must be influenced in some way. It may be that the effect is substantial in magnitude or scale, irreversible, has a long-term effect, or coincides with a critical period in a species' life-cycle. Where uncertainty or limitations exist, this is acknowledged.

17.3.21. It is recognized that discernible effects can also occur at a local geographic scale which are not sufficiently severe to be assessed as 'significant' in accordance with the EIA approach, and do not require specific mitigation, but nonetheless merit discussion. In the interest of completeness these effects will be discussed within the ES Ecology and Nature Conservation Chapter in

relation to general construction good practices to be adopted to avoid or minimise low-level or minor disruption to local features, including for example standard pollution prevention and control measures.

Zones of Influence

- 17.3.22. The 'zone of influence' for a development is the area over which ecological and ornithological features may be affected by biophysical changes as a result of the development and associated activities.
- 17.3.23. The zones of influence for The Scheme are acknowledged to have the potential to extend beyond direct land-take required and have been identified in view of the nature of The Scheme as described in **Chapter 2**, consultation and Scoping process and current CIEEM and Natural England ('NE') Standing Advice³ as applicable and available.
- 17.3.24. The zone of influence will therefore vary for different ecological and ornithological features depending on their sensitivity to environmental change.
- 17.3.25. Zones of influence for The Scheme and for which baseline information has been established have therefore been identified on the basis of proximity to The Scheme as follows:
- **Statutory designated sites for nature conservation** (excluding geological sites): within 5km from the Draft Order Limits, extended to 10km for internationally designated sites (comprising Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites⁴);
 - **Non-statutory designated sites for nature conservation** (excluding geological sites): within 2km from the Draft Order Limits⁵;
 - **Protected, priority and otherwise notable species** (e.g. Natural Environment and Rural Communities (NERC) Act 2006 Section 41 Species of Principal Importance): within 2km of the Draft Order Limit boundary⁶;

³ Natural England (2022) *Protected species and development: advice for local planning authorities* <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications> (accessed 10/07/2023)

⁴ Based on professional judgement and guidance provided within Nature Scot. (2016). *Assessing Connectivity with Special Protection Areas (SPAs) – Version 3*.

⁵ This is a standard requirement to inform planning applications, as detailed within *CIEEM (2020) Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK*. 2nd Edition. Chartered Institute of Ecology and Environmental Management. Winchester, UK.

⁶ This is a standard requirement to inform planning applications, as detailed within *CIEEM (2020) Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK*. 2nd Edition. Chartered Institute of Ecology and Environmental Management. Winchester, UK.

- **Priority habitats** (e.g., NERC Act 2006 Section 41 Priority Habitats): within 2km of the Draft Order Limit boundary⁷;
- **Widespread habitats and vegetation**: within and immediately adjacent to the Draft Order Limits⁸;
- **Breeding birds**: within the Draft Order Limits and immediately adjacent boundary habitats viewable from the Draft Order Limits ⁹;
- **Non-breeding birds**: the Draft Order Limits and surrounding fields up to 600m from the Draft Order Limits where access was possible, or where land could be viewed from publicly accessible locations¹⁰;
- **Badgers**: within the Draft Order Limits and areas out to at least 30m (where access allowed);
- **Otter and water vole**: ditch networks within the Draft Order Limits; and
- **Great crested newts (GCN)**: within the Draft Order Limits and within suitable breeding ponds/waterbodies out to 250m of the Draft Order Limits boundaries.

Baseline Data Gathering

Desk Study

- 17.3.26. A desktop study was undertaken in April 2023 to identify any known existing features or species of ecological importance within and surrounding the Draft Order Limits. The desktop study included a review of relevant policy and guidance and sought to identify any statutory designated sites for nature conservation through a review of the Natural England Designated Sites View¹¹, Joint Nature Conservation Committee (JNCC)¹² and Multi Agency Geographic Information for the Countryside (MAGIC)¹³ websites. A 5km search radius surrounding the Draft Order Limits was adopted for all statutory designated sites, extending to 10km for international protected sites.
- 17.3.27. The MAGIC website review also included details of granted European Protected Species (EPS) mitigation licence applications and great crested newt class licence return results up to July 2022, together with a review of Natural England Open Data on great crested Newt eDNA pond

⁷ This is a standard requirement to inform planning applications, as detailed within *CIEEM (2020) Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK*. 2nd Edition. Chartered Institute of Ecology and Environmental Management. Winchester, UK.

⁸ Undertaken in adherence to the guidance provided in Butchery, B. Carey, P. Edmonds, R. Norton, L. Treweek, J. (2020). The UK Habitat Classification Manual Version 1.1

⁹ The methodology employed was based-upon a scaled-down version of the British Trust for Ornithology (BTO) Common Bird Census (CBC) technique, as detailed in Gilbert et al. (1998).

¹⁰ Based on professional judgement and guidance provided within M. Ruddock & D.P. Whitfield. (2007). A Review of Disturbance Distances in Selected Bird Species. Nature Scot

¹¹ Available at: <https://designatedsites.naturalengland.org.uk/> (accessed 25.05.2023)

¹² Available at: <http://jncc.defra.gov.uk/> (accessed 25.05.2023)

¹³ Available at: <https://magic.defra.gov.uk/MagicMap.aspx> (accessed 25.05.2023)

surveys for district level licensing (DLL) (England)¹⁴. A 2km search radius around Draft Order Limit boundary was adopted for these sources.

- 17.3.28. Biological record data regarding non-statutory designated sites and records of protected and notable species from the Greater Lincolnshire Nature Partnership (GLNP) and Doncaster Biological Records Centre (DoBRC). A 2km search radius was used from the Draft Order Limit boundaries. Records dated within the past ten years were used unless historic records (pre-2013) were received from within (or within close proximity to) the Draft Order Limits and/or where historic records were considered particularly pertinent to The Scheme.
- 17.3.29. Reference was also made to Ordnance Survey maps of the wider area and online aerial images in order to determine any features of nature conservation interest in the wider area.
- 17.3.30. The results of the desktop study are provided in **Figure 2: Statutory Designated Sites Plan** and **Figure 3: Non-statutory Designated Sites Plan of Technical Appendix 7.1** and discussed in greater detail within the associated Technical Appendix.

Habitat Survey

- 17.3.31. Walkover habitat surveys were undertaken over three visits on;
- 2nd and 3rd March 2022;
 - 20th March 2022; and,
 - 10th, 11th and 12th August 2022.
- 17.3.32. A further extended habitat survey of the Draft Order Limits, is being undertaken in August and September 2023, which will look to update the 2022 data as well as provide habitat condition assessments for the Draft Order Limits during an optimal survey period for habitats. All surveys are completed by suitably qualified and experienced ecologists.
- 17.3.33. Detailed survey methodologies and findings are detailed in **Technical Appendix 7.1** and habitat plans are provided in **Figure 4A to 4G** within **T7.1**.

Species Surveys

- 17.3.34. The following baseline species-specific surveys and assessments were undertaken between March 2022 and June 2023:
- Breeding bird surveys;
 - Nightjar survey of Thorne & Hatfield Moors designated sites only. No further surveys for nightjar are proposed as data gathered through this survey, accompanied by monitoring information from the operational wind farm, is considered sufficient for robust assessment;

¹⁴ Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/great-crested-newts-edna-pond-surveys-for-district-level-licensing-england?geometry=-1.451%2C51.749%2C-1.002%2C51.823> (Accessed on 25/05/2023).

- Water vole and otter survey (targeted first visit);
- Badger survey;
- Great crested newt eDNA survey;

17.3.35. The following surveys are underway in 2023;

- Update to Badger survey;
- Water vole and otter survey (targeted second visit);
- Invertebrate habitat assessment and targeted scoping survey; and
- Non-breeding/winter (Year 2) bird surveys commencing September 2023 and due to continue until March 2024 (with minor area not previously surveyed).

17.3.36. The results of all surveys will be provided as Technical Appendices to accompany within the next iteration of the PEIR Chapter.

Biodiversity Net Gain

17.3.37. It is not yet a mandatory requirement¹⁵ for NSIP applications to demonstrate a quantifiable biodiversity net gain (BNG) of at least 10% under the Environment Act 2021. However, the Applicant intends to provide evidence of the deliverability of measurable BNG as part of the final submitted ES Chapter, in accordance with NERC obligations and the revised draft Overarching National Policy Statement for Energy (EN-1) and revised draft National Policy Statement for Renewable Energy Infrastructure (EN-3).

17.3.38. The DEFRA Biodiversity Metric Calculator¹⁶ will be utilised to provide evidence of achievable on-Site 10% BNG associated with The Scheme and will be presented as a Technical Appendix of the ES Chapter.

17.3.39. For the purposes of impact assessment, the delivery of a quantifiable BNG will be considered as an inherent part of The Scheme, i.e., embedded enhancement.

Legislative and Policy Framework

National Planning Policy

¹⁵ BNG delivery will for a legal requirement for all (terrestrial) NSIP projects from November 2025, further information available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-nsip-reforms-action-plan/nationally-significant-infrastructure-action-plan-for-reforms-to-the-planning-process> (accessed 25.05.2023)

¹⁶ The BNG calculations will be undertaken utilizing the most recent DEFRA BNG Metric available, currently this is represented by the Biodiversity Metric 4.0, available at: <https://publications.naturalengland.org.uk/publication/6049804846366720> (accessed 25.05.2023)

17.3.40. The Overarching National Policy Statement for Energy (EN-1)¹⁷ includes policies regarding Biodiversity (Chapter 5.3); which requires developments to;

'avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives ...where significant harm cannot be avoided, then appropriate compensation measures should be sought'.

17.3.41. In addition, the Overarching National Policy Statement for Energy (EN-1) states that;

'in taking decisions, the Infrastructure Planning Commission should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity...interests within the wider environment'.

17.3.42. The National Policy Statement for Renewable Energy Infrastructure (EN-3)¹⁸ together with the Overarching National Policy Statement for Energy (EN-1) (above), provides the decision-making basis of the Infrastructure Planning Commission on applications for nationally significant renewable energy infrastructure. Therefore, applications and accompanying supporting documents and information should be consistent with the instructions and guidance in this policy statement and corresponding biodiversity information provided within the EN-1 document.

17.3.43. The revised draft Overarching National Policy Statement for Energy (EN-1)¹⁹ (published in March 2023) which includes further information regarding biodiversity, the document states;

'where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance..., on protected species and on habitats and other species identified as being of principal importance for

¹⁷ Department of Energy and Climate Change (2011). *Overarching National Policy Statement for Energy (EN-1)*. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf (accessed 25.05.2023)

¹⁸ Department of Energy and Climate Change (2011). *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37048/1940-nps-renewable-energy-en3.pdf (accessed 25.05.2023)

¹⁹ Department for Energy Security & Net Zero. (2023). *Overarching National Policy Statement for Energy (EN-1)*, Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf (accessed 25.05.2023)

the conservation of biodiversity, including irreplaceable habitats’.

17.3.44. Furthermore, the revised draft Overarching National Policy Statement for Energy (EN-1), states that;

‘the applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests...the design process should embed opportunities for nature inclusive design. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains’.

17.3.45. The revised draft National Policy Statement for Renewable Energy Infrastructure (EN-3)²⁰ (published in March 2023) also includes further information regarding biodiversity, the document states;

‘proposed enhancements should...aim to achieve environmental and biodiversity net gain in line with the ambition set out in the Environmental Improvement Plan and any relevant measures and targets, including statutory targets set under the Environment Act or elsewhere...this might include maintaining or extending existing habitats and potentially creating new important habitats’.

The Development Plan

17.3.46. The Doncaster Council Local Plan (2021)²¹ includes a number of policies which include reference to biodiversity, including:

- Policy 26; *Green Infrastructure*, which includes reference to the protection, maintenance and enhancement (where possible) of ecological networks, natural environment and biodiversity.
- Policy 29; *Ecological Networks (Strategic Policy)*, which includes the requirement for proposals to deliver a net gain for biodiversity and ‘protect, create, maintain and enhance the Borough’s ecological networks’.
- Policy 30; *Valuing Biodiversity and Geodiversity (Strategic Policy)* which refers to the protection of internationally, nationally and locally important habitats, sites and species such as nightjar.

²⁰ Department for Energy Security & Net Zero. (2023). National Policy Statement for Renewable Energy Infrastructure. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf (accessed 25.05.2023)

²¹ Doncaster Council (2021) *Doncaster Local Plan 2015-2035* Available at; <https://www.doncaster.gov.uk/services/planning/local-plan> (accessed 08.06.23)

- Policy 31; *Local Wildlife and Geological Sites* which includes policy regarding the protection of these sites and sites that are awaiting designation but meet qualifying criteria.
- Policy 32; *Woodlands, Trees and Hedgerows* ensures that these habitats have been due-ly considered and there is no adverse impact on their public amenity and ecological interest.
- Policy 33; *Landscape (Strategic Policy)* which includes policy to ensure that the proposals conserve, enhance and restores the local environment including Thorne and Hatfield Moors. Proposals will also need to have consideration for the ‘quality, local distinctiveness, sensitivity to change of distinctive landscape character areas and individual landscape features’.

17.3.47. The South Yorkshire Mayoral Combined Authority (SYMCA) Strategic Economic Plan (SEP) 2021–2041²² covers Doncaster. The three overarching policy objectives are growth, inclusion and sustainability, with clear mention of protecting and enhancing biodiversity through achieving biodiversity net gain.

Scoping Criteria

17.3.48. A Scoping report was submitted to PINS on 26th January 2023 (Document Reference; SCO 01 Rev.1) The following ecology and nature conservation comments were provided in the Planning Inspectorate Scoping Opinion dated 14 March 2023.

Table 7.6 Extract of aspect based scoping table from Scoping Opinion for Tween Bridge Solar Farm

ID	REF	MATTER	PLANNING INSPECTORATE COMMENTS	APPLICANT’S RESPONSE
3.6.1	Paras 5.62 to 5.64; 5.76 and 5.78	Important ecological features (PINS)	<p>The Scoping Report proposes that the ES will only contain a detailed assessment of impacts on ‘important’ ecological features (as per the CIEEM Guidelines)¹. A detailed assessment of ecological features that are sufficiently widespread, unthreatened and/ or resilient to impacts of the Proposed Development would be scoped out.</p> <p>The ES should explain how the importance of ecological features has been determined, with reference to baseline data, relevant guidance and</p>	<p>This PEIR sets out the methodology adopted for the ecological assessment based on guidance issued by CIEEM and EIA (CIEEM, 2018²³) which references use of baseline data, survey methods, relevant guidance and professional judgement.</p> <p>Identification of important ecological features and those features that can be scoped into or out of the detailed assessment will be identified and are being discussed with Natural</p>

²² South Yorkshire Mayoral Combined Authority (2022) Available at; [SCR_SEP_Full_Draft_Jan_21-\(accessible\).pdf \(southyorkshire-ca.gov.uk\)](#) (accessed 08.06.23)

²³ Chartered Institute of Ecology and Environmental Management ‘Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine’. CIEEM (2018).

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			<p>professional judgement. The Applicant should make effort to agree the list of ‘important’ ecological features with the relevant local planning authorities and Natural England (NE). Subject to this, the Inspectorate agrees that a detailed assessment of impacts on ecological receptors which are not determined to be ‘important’ can be scoped out of the ES.</p>	<p>England and the relevant LPA.</p>
3.6.2	Para 5.65 and Table 5.2	Statutory designated sites (PINS)	<p>Having regard to the nature and characteristics of the Proposed Development, the Inspectorate is content that this matter can be scoped out for the operational phase.</p> <p>Sections 7 (Ground Conditions) and 8 (Hydrology and Flood Risk) of the Scoping Report identify the potential for construction to result in contamination of surface water courses or groundwater via spills and leaks, or through disturbance of existing contaminated soils. The Inspectorate notes that NE (see Appendix 2 of this Opinion) considers the application site could be hydrologically connected to statutory designated sites. As information has not been provided within the Scoping Report to confirm the absence of a hydrological pathway for significant effects on statutory designated sites during construction and decommissioning, the Inspectorate is not in a position to scope out this matter for construction and decommissioning.</p>	<p>Statutory (and non-statutory) designated sites within and around the Draft Order Limits have been identified, and the potential for hydrological changes or water quality impacts (including nutrient inputs) during construction. Operation and any future decommissioning will form part of the assessment within the PEIR/ES.</p>

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			<p>The ES should assess any likely significant effects on statutory designated sites including those located over 2km from the site resulting from hydrological changes and water quality impacts, during construction and decommissioning. The assessment should include the potential for increased nutrient and other pollutant inputs</p>	
3.6.3	Para 5.66 and Table 5.2	Statutory designated sites – mobile qualifying features (PINS)	<p>Paragraph 5.66 of the Scoping Report proposes that designated sites within 10km of the site with associated qualifying bird assemblages are scoped out of the ES. However, Table 5.2 of the Scoping Report identifies this matter as scoped into the assessment meaning the Applicant’s proposed approach is unclear.</p> <p>For the avoidance of doubt, the Inspectorate considers that this matter should be scoped into the ES. In particular the Inspectorate considers there is potential for significant effects as a result of hydrological changes and water quality impacts (see above) and habitat loss or disturbance of any qualifying features using the application site and surrounding area. The scope of the assessment should be sufficient to ensure that significant effects to habitats and features due to any functional link with statutory designated sites (including the Humber Estuary Special Protection Area (SPA)/ Ramsar/ Site of Special Scientific Interest (SSSI);</p>	<p>Impacts on statutory designated sites (with mobile qualifying features) within 10km of the Draft Order Limits have been scoped into the PEIR/ES for detailed assessment. This will include an assessment of the potential for significant effects on functionally linked land associated with such sites.</p> <p>A Habitats Regulations Assessment will be undertaken in order to provide specific information in regard to internationally designated sites and their qualifying interests including the Humber Estuary Special Protection Area (SPA) and Ramsar, and Thorne and Hatfield Moors SPA.</p>

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			Thorne and Hatfield Moors SPA; Thorne, Crowle and Goole Moors SSSI; and Hatfield Moor SSSI) are assessed.	
3.6.4	Para 5.67 and Table 5.2	Low sensitivity habitats (PINS)	The ES should explain how the classification of any habitat as 'low sensitivity' has been determined, with reference to baseline data, relevant guidance and professional judgement. The Applicant should make effort to agree its findings on sensitivity with the relevant local planning authorities and NE. Subject to this, the Inspectorate is content to scope this matter out.	<p>This PEIR sets out the methodology adopted for the ecological assessment based on published ecological guidance such that issued by CIEEM which includes accepted approaches to the identification of habitats and appraisal of ecological value based on plant communities present, the species such habitats may support along with information on underlying environmental conditions and land management practices.</p> <p>Habitats and supporting survey information will be discussed with Natural England and the relevant LPA as part of the ongoing consultation process. Results of this will be included within the next iteration of the PEIR.</p>
3.6.5	Para 5.68 and Table 5.2	Invertebrates (PINS)	Table 5.1 of the Scoping Report describes the Hatfield Chase Ditches SSSI (within the site boundary) as supporting rare invertebrates. The Thorne, Crowle and Goole Moors SSSI (adjacent to the site) and Hatfield Moor SSSI (in close proximity) are also described as supporting a range of invertebrates. The Inspectorate considers that impacts from the Proposed Development, such as changes in water quality, could result in significant effects on invertebrates. Therefore, this	Baseline data, will be gathered through a desk study. In addition, a habitat suitability assessment survey will be undertaken of the Draft Order Limits with targeted scoping survey focussed on habitat within the Draft Order Limits that are in close proximity to designated sites. This approach is being discussed with the relevant LPAs as part of the ongoing consultation process.

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			<p>matter cannot be scoped out of the ES.</p> <p>The ES should assess impacts to invertebrates which are likely to result in significant effects. The assessment should be based on sufficient baseline survey data.</p>	
3.6.6	Paras 5.45 and 5.69 and Table 5.2	Reptiles (PINS)	<p>The Scoping Report proposes to scope out specific surveys for reptiles (para 5.45) and a detailed assessment of impacts (para 5.69), stating that baseline surveys have not identified the site as being sufficiently important to lead to the potential for significant effects. However, Table 5.2 of the Scoping Report identifies reptiles as scoped into the assessment meaning the Applicant's proposed approach is unclear.</p> <p>The Inspectorate is therefore not in a position to agree that these matters can be scoped out. The ES should assess potential impacts on reptiles, supported by robust baseline survey data, unless otherwise agreed with relevant consultation bodies.</p>	<p>The PEIR / ES will address the potential for impacts on reptiles based on habitat survey and suitability appraisal and an understanding of the lifecycle requirements of reptile species. Detailed surveys for reptiles are not currently proposed as the Draft Order Limits predominantly comprises of managed agricultural/arable land, accepted as having limited suitability to support notable reptile populations. As habitat of higher value to reptile species will be protected and retained as part of The Scheme it is reasonable to scope out the potential for significant adverse effects on local reptile populations and address the safeguarding of individuals potentially present within a Construction Environment Management Plan (CEMP). This will be set out in the ES, and will form part of the ongoing consultation process with NE.</p>
3.6.7	Para 5.69 and Table 5.2	Other priority mammals (PINS)	<p>Paragraph 5.69 of the Scoping Report proposes to scope out a detailed assessment of impacts on these species, stating that baseline surveys have not identified the site as</p>	<p>The ES will address potential impacts on these species, supported by habitat and locality information and local records and professional</p>

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			<p>being sufficiently important to lead to the potential for significant effects.</p> <p>The Inspectorate notes that the Applicant has not yet undertaken ecological surveys of the study area (with the exception of a Walkover Survey and bird surveys) and that the site may potentially support these species. Without certainty on the extent and presence of these species, the Inspectorate does not agree that a detailed assessment of impacts on brown hare, polecat, harvest mouse and hedgehog can be scoped out.</p> <p>The ES should address potential impacts on these species, supported by robust baseline survey data, unless otherwise agreed with relevant consultation bodies.</p>	<p>understanding of the lifecycle and requirements of these species, which enables an informed judgement to be made. Detailed surveys are not considered likely to further inform the assessment process given the largely agricultural /arable habitats present and the embedded retention and protection of those habitats likely to support such species which will be set out in detail in the ES.</p> <p>This approach will form part of the ongoing consultation process.</p>
3.6.8	Para 5.71 and Table 5.2	Lighting (PINS)	<p>In the absence of defined locations for principal development components and without certainty on the extent and presence of certain species (including SPA/Ramsar bird qualifying features), the Inspectorate does not agree that this matter can be scoped out.</p>	<p>Lighting will form part of the ecological assessment in the ES, with reference to a variety of species which may be especially sensitive to changes in lighting. Given the limited degree that The Scheme requires lighting (the operational solar farm will for example not be lit). Impacts from, lighting will be addressed in the Mitigation Section of Chapter 7 of the ES, and are discussed in Section 7.15 of this chapter of the PEIR.</p>
3.6.9	n/a	Sensitive information (PINS)	<p>Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to</p>	<p>Information relating to sensitive or vulnerable species (such as badger) is provided as a separate Confidential Appendices to this PEIR. This approach will be maintained for the final ES. This can be evaluated by</p>

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			<p>the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex. All other assessment information should be included in an ES chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available subject to request.</p>	<p>the Inspectorate but only made available to the wider public on a restricted basis.</p>
3.6.10	Paras 5.5, 5.6 and 5.14	Bird surveys (PINS)	<p>Breeding bird surveys were completed during April to July 2022. The Scoping Report states that whilst areas of the site boundary have been omitted from the breeding bird surveys (due to the design evolution of the Proposed Development), the baseline data is considered sufficient "...to reliably inform an Ecological Assessment Process".</p> <p>The Scoping Report states that wintering bird surveys are being undertaken from "September 2022 to March 2023 [ongoing]". The Inspectorate notes advice from NE (Appendix 2 of this Opinion) that the passage/ wintering bird surveys should cover different tidal states and consideration should be given to surveys during poor weather/ visibility conditions. NE advise that surveys at dusk and dawn should also be considered, if geese and swans on site have the potential to use the</p>	<p>The applicant is making every effort to agree the approach to breeding bird surveys and non-breeding bird surveys with Natural England. A request for DAS advice was submitted to Natural England on 11th July 2023. Evidence of all ongoing consultation responses and areas of agreement / disagreement with Natural England will be reported within the PEIR and final position will be set out in the final DCO submission..</p> <p>Surveys undertaken for the non-breeding birds have encompassed different tidal states and times of day. Further details regarding methodology and results can be found in Technical Appendix 7.3.</p>

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			<p>application site or surrounding area.</p> <p>It does not appear that further breeding bird or passage/ wintering bird surveys are proposed to inform the ES. The ES should be based on sufficient baseline data to support a robust assessment of LSE as required by the EIA Regulations 2017. The Applicant should make effort to agree the approach to breeding bird surveys and passage/ wintering bird surveys with NE and to evidence this at the point of DCO application submission.</p>	
3.6.11	Para 5.23	Invasive species (PINS)	The ES should assess the risks of spreading invasive species including Azolla, Himalayan Balsam, New Zealand pygmy weed and New Zealand moss during construction and operation of the Proposed Development. Any necessary eradication/ control measures should be detailed in the ES.	Surveys have identified the presence of invasive species and the final ES will include measures to ensure legislative compliance and any necessary measures to prevent the inadvertent spread or introduction of such species.
3.6.12	Paras 5.38 to 5.40	Water voles (PINS)	The use of detection dogs is noted but for the avoidance of doubt, the Inspectorate agrees with comments from the Environment Agency (Appendix 2 of this Opinion) that the assessment should include two water vole surveys at the recommended times of year. Effort should be made to agree the survey assessment methodology with relevant consultation bodies including the Environment Agency.	Two separate water vole surveys are being undertaken in line with accepted survey methods. The findings of these surveys will inform the assessment in relation to potential impacts on water voles.
3.6.13	Great Crested Newt (GCN) eDNA survey extent	Great crested newt (PINS)	The Scoping Report states that ponds within 250m of the site will be surveyed for the presence of GCN. GCN can travel up to 500m from their breeding ponds. As such, the	It is accepted practice to survey accessible ponds up to 250m from Draft Order Limits boundaries, an approach which has been accepted on numerous

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			<p>Inspectorate considers that ponds up to 500m from the site should be surveyed for the presence of GCN.</p>	<p>other solar schemes. This approach is based on NE guidance (Natural England, 2014²⁴) and the nature of solar developments that retain habitat beneath and around the panels and do not restrict opportunities for dispersal, foraging or breeding when operational. Subsequently there is limited pathway for effects. If found to be present a District Level Licence will be sought from Natural England and survey data within 250m is sufficient to support this</p> <p>GCN surveys form part of ongoing consultation with NE.</p>
3.6.14	Para 5.50	Winter bird mitigation (PINS)	<p>Wintering bird mitigation areas are proposed. Details of the location, extent, implementation (including specific timings) and management of these mitigation areas should be provided in the ES, with reference to available evidence on the requirements of relevant species. Effort should be made to discuss and agree these details with NE and other relevant consultation bodies.</p>	<p>Information on the potential effects on wintering birds and any proposed mitigation measures will be included within the PEIR/ES. These will also form part of ongoing consultation with NE.</p>
3.6.15	Para 5.52	Directional drilling (PINS)	<p>Appendix 2.1 of the Scoping Report identifies an indicative location for HDD beneath the Stainforth and Keadby Canal. Any impacts on aquatic environment and water</p>	<p>The potential impacts from directional drilling beneath the Canal will be considered within the PEIR/ES.</p>

²⁴ Natural England (2014) *Great Crested Newt Method Statement for EPS License Applications* Natural England, accessed at <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence> (accessed on 10/07/2023)

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			resource receptors from mud toxicity and bentonite breakout during HDD works which are likely to result in significant effects should be assessed in the ES.	
3.6.16	n/a	Priority botanical species, ancient woodland and ancient and veteran trees (PINS)	The ES should explain whether any scarce or priority botanical species, ancient woodland, ancient and veteran trees could potentially be impacted by the Proposed Development. Any impacts on these features which are likely to result in significant effects should be assessed in the ES.	The potential for impacts on scarce or priority botanical species, ancient woodland, ancient and veteran trees will be considered as part of the PEIR/ES.
n/a	n/a	Invasive species (Canal & Rivers Trust)	Paragraph 5.23 highlights the presence of invasive species within the canal. We advise that the report should seek to assess whether there is any risk of this species being transferred elsewhere during development, which may be dependent on the works proposed alongside or on the water.	Surveys have identified the presence of invasive species and the ES will include measures to ensure legislative compliance and any necessary measures to prevent the inadvertent spread or introduction of such species.
n/a	n/a	Directional drilling (Canal & Rivers Trust)	Directional drilling is proposed under the canal. We wish to highlight that directional drilling can still cause sediment discharges and problems arising from mud.	The potential impacts from directional drilling beneath the Canal will be considered within the PEIR/ES. However, it is not considered that these works would give rise to significant effects, as defined in the EIA Regulations (as set out in the methodology section of the PEIR/ES). Measures to address general protection measures and non-significant effects do however form part of the mitigation section of the PEIR/ES, including a CEMP.
n/a	n/a	Lighting (Canal & Rivers Trust)	We note that artificial lighting may be proposed on site, and that is proposed to not be	Lighting will form part of the ecological assessment in the ES, with reference to

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			<p>scoped into the Environmental Report. We advise that temporary construction lighting, including upon the cable corridor routing, has the potential to disturb wildlife, including along the canal.... As a result, we request that further justification may be required for not scoping this into the report, such as the agreement for additional lighting details to be provided prior to the commencement of construction works. The submission of a construction phase lighting plan with LUX values provided could offer an appropriate solution, and could potentially be provided post determination.</p>	<p>a variety of species which may be especially sensitive to changes in lighting. Given the limited degree that The Scheme requires lighting (the operational solar farm will for example not be lit), lighting will largely be addressed in the Mitigation Section of ecological assessment and the CEMP.</p>
n/a	n/a	Hedgerows of (City of Doncaster Council)	<p>The cultural significance of the existing hedgerows should be recognised in the Environmental Statement along with details of their structural condition and species composition as part of the of hedgerow/arboricultural survey data in accordance with BS5837 (2012) which will also need to identify individual or groups of trees and woodlands. These features, along with the hedgerows would, in principle, be expected to be retained and enhanced with increased connectivity as part of this scheme</p>	<p>Hedgerows are recognised as important ecological and cultural features, and the design of The Scheme retains and protects the hedgerow network across the Draft Order Limits (existing field entrances will be utilised with the possibility of some minor breaches for access only).</p> <p>Habitat survey and the landscape appraisal will provide information within the ES on existing trees, woodland and hedgerows. The relevant chapters within the PEIR/ES will provide information on proposals for new habitat creation and planting to strengthen and connect these features, and where necessary, address replacement planting for any unavoidable small-scale removal.</p>

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n/a	n/a	Water (City of Doncaster Council)	<p>Assess potential impacts on flows (volume and pathways) and potential for temporary or permanent changes, particularly those that might result in the lowering of the water table. Mapping of surface water requirements for all habitat types within the study area.</p> <p>-Assess the potential for standing water and impacts of drainage of standing water.</p> <p>-Groundwater studies to identify if surface activities will affect discharge into ground water resources.</p> <p>-An assessment/review of the potential for nutrient enrichment of surface and ground waters associated with the planned sheep grazing.</p>	The PEIR/ES will address hydrology and water quality matters in the relevant Chapters, along with consideration of the potential changes to land management and the potential for effects on receiving surface waters.
n/a	n/a	Mire species, peat, nightjar and bats (City of Doncaster Council)	Landscape appraisal linking in with flora and fauna i.e. presence of mire species in relation to pockets of peat soils, landscape features and nightjar and bat foraging/commuting.	<p>Habitat surveys have confirmed that the Draft Order Limits are predominantly agricultural land under arable/non arable cropping. Habitat survey in 2022 found there are no remnant areas of moorland or mire communities within the Draft Order Limits, which will be confirmed and updated during further habitat surveys in 2023.</p> <p>The PEIR/ES will address the potential for effects on protected species including nightjar and bats as well as habitats and peat soils.</p>
n/a	n/a	Habitat mapping (City	Site and beyond habitat mapping. Identification through habitat mapping of	The PEIR/ES will include the findings of a series of habitat and species surveys which will inform

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		of Doncaster Council)	sensitive sites that have supporting roles in the maintenance of qualifying features on protected sites. An appraisal of trends of regeneration and habitat development.	the assessment of potential effects.
n/a	n/a	Mire & aquatic flora (City of Doncaster Council)	Identification of specific requirements of specialist mire and aquatic flora. Review of literature and papers concerned with regeneration of these species that are extremely specialised in their requirements and potential for these to be disturbed	Habitat surveys have confirmed that the Draft Order Limits are predominantly agricultural land under arable/non arable cropping. Habitat survey in 2022 found there are no remnant areas of moorland or mire communities within the Draft Order Limits, which will be confirmed and updated during further habitat surveys in 2023. The PEIR/ES will address the potential for effects on protected and notable species, in particular those associated with nearby designated sites.
n/a	n/a	Faunal surveys (City of Doncaster Council)	Faunal surveys to include key species, their interaction with the habitats of the area and potential impacts associated with construction and operational phases.	A range of species and habitat surveys are underway and the results will be included as part of the PEIR/ES and will be used to inform the ecological assessment.
n/a	n/a	Birds (City of Doncaster Council)	Birds: Overwintering surveys with an extension of at least 0.5km beyond site boundary. Details of qualifying and nonqualifying avian species of significance populations and survey information on potential impacts on these species. -Breeding bird surveys will be required.	Breeding and non-breeding bird surveys have been completed and the results are included as part of the PIER and will be used to inform the ecological assessment presented in the PEIR/ES.

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			-Review of recorded nightjar foraging distribution/activity and survey for existing and potential habitat features outside of protected sites.	
n/a	n/a	Aquatic fauna (City of Doncaster Council)	Aquatic fauna: Usual survey methods to provide a detailed overview of presence and potential for impacts particularly during construction phase. Otter, water vole surveys are required and also potential of adverse impacts of mink.	Aquatic fauna are recognised ecological receptors associated with the network of drains, ditches and ponds present within the Draft Order Limits and across adjacent land. The PEIR/ES will include consideration of the likely presence of and potential for impacts upon protected species such as water vole and otter.
n/a	n/a	Scope of assessment (East Riding of Yorkshire Council)	East Riding of Yorkshire Council is happy with the scope of the assessment and has no further comments to make at this stage.	No response required.
n/a	n/a	Protected sites (Environment Agency)	We note the Thorne Moors SAC/SPA/SSSI to the north of the site, the local wildlife site of Stainforth and Keadby Canal Corridor and the surface watercourses including main rivers on the site. In general we agree with the proposed approach and the biodiversity aspects scoped in	No response required.
n/a	n/a	Water vole surveys (Environment Agency)	Water vole surveys: The assessment should follow best practice guidelines and include two surveys at the recommended times of year. • Biodiversity net gain (BNG): Section 5.74 (of the Scoping Report) states that the EIA will seek to demonstrate 10% net gain. Whilst we acknowledge that it is not yet a mandatory	Two separate water vole surveys are being undertaken in line with standard survey methodology, targeting key ditches within the Draft Order Limits. Although not a mandatory requirement, the PEIR/ES will include demonstrable

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			<p>requirement, we would encourage the project to make a commitment to delivering 10% as a minimum, given its scale.</p> <ul style="list-style-type: none"> • There may be opportunities for BNG and wider environmental gain in relation to controlled waters. 	<p>BNG as part of the ecological and landscape enhancements proposed within the design.</p>
n/a	n/a	Multiple (Natural England)	<p>As part of the general guidance provided in it's response, NE refers to Regulation 11 of the Infrastructure Planning Regulations 2017 as follows: (The EIA Regulations) sets out the information that should be included in an Environmental Statement (ES) to assess impacts on the natural environment. And also to the requirement for consideration of the potential for cumulative effects including a full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.</p> <p>The assessment will need to include potential impacts of the proposal upon sites and features of nature conservation interest as well as opportunities for nature recovery through biodiversity net gain (BNG).</p> <p>The general guidance also refers to Technical Information Note which provides a summary of advice about their siting, their potential impacts and mitigation requirements for the safeguarding of the natural environment. Solar</p>	<p>The PEIR/ES will include information as set out in the EIA Regulations, and assess the potential for cumulative effects, effects in relation to designated sites of nature conservation interest and protected species along with mitigation and protection measures as necessary. The PEIR/ES will demonstrate BNG as part of proposed enhancements.</p>

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			<p>parks: maximising environmental benefits (TIN101).</p> <p>NE further states:</p> <p>The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance / European sites, including marine sites where relevant. This includes Special Protection Areas (SPA), Special Areas of Conservation (SAC), listed Ramsar sites, candidate SAC and proposed SPA.</p> <p>4.3 Article 6 (3) of the Habitats Directive requires an appropriate assessment where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other plans or projects.</p>	<p>An 'Information to Inform a Habitats Regulations Assessment' report in relation to internationally protected sites and associated qualifying features will be submitted with the PEIR/ES.</p>
n/a	n/a	International designated sites (Natural England)	<p>NE provides detailed comments regarding potential risks to international designated sites and matters for consideration within the Habitats Regulations Assessment (HRA) report in Table 1 of its response including in relation to functionally linked land, use by mobile qualifying species (birds), hydrological connectivity, potential for surface water and water quality impacts, dust and air quality impacts and lighting impacts (full Table can be found at Scoping Response Document Ref EN010148)</p>	<p>The PEIR/ES will consider such features as set out in NE's response and these will also form part of ongoing consultation with NE.</p>

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n/a	n/a	Review paper-solar farms (Natural England)	Natural England has produced a review paper which includes information on the impacts of solar farms on birds, we recommend that this is considered when undertaking the assessment (Natural England, 2017 ²⁵).	This review paper will be considered when undertaking the assessment
n/a	n/a	Hatfield Chase Ditches SSSI (Natural England)	Table 1 also addresses Nationally Designated Sites including Natural England notes paragraph 5.18 of the Tween Bridge Solar Farm Scoping Report (dated January 2023) that Hatfield Chase Ditches SSSI is within the application site. Therefore, potential impact pathways need to be assessed such as direct habitat loss, water quality, water supply, air quality and disturbance	The potential for effects on designated sites, including Hatfield Chase Ditches SSSI, will form part of the assessment and included in the PEIR/ES.
n/a	n/a	SSSI impacts (Natural England)	Our advice regarding the potential impact pathways upon the other SSSIs listed above broadly coincides with those set out in Table 1 above for their corresponding European sites. However, we highlight that Thorne, Crowle & Goole Moors SSSI and Hatfield Moor SSSI are designated for additional features including assemblages of breeding birds (mixed: lowland damp grassland, lowland heath, scrub, woodland) and invertebrate assemblage. Therefore, potential impacts on these features should also be considered in the relevant assessment.	The potential for direct and indirect effects on designated sites and their qualifying features will be addressed in the PEIR/ES, along with avoidance, protection and mitigation measures as appropriate.

²⁵ Natural England (2017) *Evidence review of the impact of solar farms on birds, bats and general ecology (NEERO12)* Natural England, [Evidence review of the impact of solar farms on birds, bats and general ecology 2016 – NEERO12 \(naturalengland.org.uk\)](https://www.naturalengland.org.uk/NEERO12) (accessed 10/07/23)

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			The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within the SSSI and identify appropriate mitigation measures to avoid, minimise or reduce any adverse significant effects.	
n/a	n/a	Protected species (Natural England)	<p>The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats).</p> <p>Records of protected species should be obtained from appropriate local biological record centres, nature conservation organisations and local groups. Consideration should be given to the wider context of the site, for example in terms of habitat linkages and protected species' populations in the wider area</p>	The assessment of potential impacts on protected species will form part of the PEIR/ES and will be informed by a range of habitat and protected species surveys and baseline data from Local Biological Records Centres, supported by professional judgement and ecological literature on the lifecycles/habitat requirements, population distributions and sensitivities of such species.
n/a	n/a	Methodologies (Natural England)	The area likely to be affected by the development should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.	A range of species and habitat surveys are underway and the results will be included as part of the PEIR/ES and will be used to inform the ecological assessment. Surveys are undertaken by suitably experienced professional ecologists in line with standard survey methods, or else otherwise agreed.
n/a	n/a	Great crested newts (Natural England)	We note in the Scoping report that further surveys for great crested newts (GCN) have been suggested, we advise that you may wish to consider district level licensing.	Surveys of ponds for the potential presence of GCN has been undertaken in 2023. The findings will be used to inform appropriate protection and mitigation measures. It can be

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				confirmed that a District Level Licensing approach will be adopted if necessary.
n/a	n/a	Priority habitats (Natural England)	An appropriate level habitat survey should be carried out on the site, to identify any important habitats present. In addition, ornithological, botanical, and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present	Habitat and ornithological surveys along with other species surveys are underway or complete, and will be used to inform the assessment within the PEIR/ES
n/a	n/a	Ancient woodland, ancient and veteran trees (Natural England)	Ancient woodland, ancient and veteran trees: The ES should assess the impacts of the proposal on any ancient and veteran trees, and the scope to avoid and mitigate for adverse impacts. It should also consider opportunities for enhancement	The potential for impacts on scarce or priority botanical species, ancient woodland, ancient and veteran trees will be considered as part of the PEIR/ES. Opportunities for enhancement will be addressed as part of the proposed BNG approach.
n/a	n/a	Biodiversity Net Gain (Natural England)	Natural England notes and supports the applicant's aspiration to deliver 10% Biodiversity Net Gain measured utilising the Biodiversity Metric 3.1 stated within the scoping report. However, given the scale of the project and a history of successful delivery of BNG for solar projects. Natural England encourages the applicant to commit to delivery of 10% Natural England recognises the high opportunity for the development to deliver Biodiversity Net Gain (BNG) on-site. In addition, the applicant should be aware of forthcoming guidance and legislation in	Although not a mandatory requirement, the PEIR/ES will include demonstrable BNG as part of the ecological and landscape enhancements proposed within the design.

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			relation to the Environment Act 2021, which may be released in the interim prior to submission of the DCO application	
n/a	n/a	Air Quality (Natural England)	<p>Natural England welcomes that paragraph 12.43 of the Tween Bridge Solar Farm Scoping Report (dated January 2023) states that air quality impacts from increased vehicle emissions, dust and Non-Road Mobile Machinery during the construction phase and vehicle emissions during the operation stage will be considered in the HRA. Natural England therefore advises that ammonia sourced from traffic emissions should be included for assessment within the HRA.</p>	Further information relating to this will be included within the next iteration of the PEIR.
n/a	n/a	Climate change (Natural England)	<p>Climate Change: The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Para 174), which should be demonstrated through the ES</p>	Embedded enhancements as part of the BNG/landscape mitigation will be delivered as part of The Scheme and be maintained over the lifetime of the project (at least 40 years). There will be the commitment to long-term measurable benefits that will contribute to enhancement of the natural environment and resilient ecological networks.

Limitations to the Assessment

TWEEN BRIDGE SOLAR FARM

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17.3.49. Additional ecological surveys are underway during the 2023 survey season, and therefore are not provided within this PEIR, however, all results and associated updated assessment will be provided within the final ES Chapter.

17.3.50. There are no other identified substantive limitations to the final ES Ecology and Nature Conservation Chapter.

17.4. Baseline Conditions

Draft Order Limit Description and Context

17.4.1. The Draft Order Limits consist of 1,566.96ha of agricultural land, 82.52% of which consists of arable farmland with cereal and non-cereal crops. Fields are bounded by watercourses as well as fences, hedgerows and tree lines. Modified grassland used for pastoral gland is also present within the Draft Order Limits as well as a woodland copse and a number of ponds.

17.4.2. The Tween Bridge Wind Farm is located within the Draft Order Limits, and consists of twenty-two operational wind turbines. The Stainforth and Kneadby Canal crosses the Draft Order Limit from west to east.

17.4.3. In the wider context, the Draft Order Limits is surrounded by extensive areas of farmland and areas of woodland, with areas of lowland peat bog (Thorne & Hatfield Moors) located to the north and south of the Draft Order Limits.

17.4.4. The Draft Order Limit lies outside designated sites, with the exception of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI. Whilst the Moors SPA/SAC/SSSI lies within the Draft Order Limit, they are outside the development footprint.

Baseline Survey Information

Desk Study

17.4.5. A summary of the desk study results is provided below, further information is provided within **Technical Appendices; 7.1, 7.2, 7.3, 7.5, 7.6 and 7.7.**

Statutory Designated Sites for Nature Conservation

17.4.6. The Draft Order Limit lies outside designated sites with the exception of a small 0.53ha areas of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI. Whilst the Moors SPA/SAC/SSSI lies within the Draft Order Limit, they are outside the development footprint and therefore no work is scheduled within these designated sites.

17.4.7. A further four international statutory designated sites occur within 10km of the Draft Order Limits boundary and eight national statutory designated sites occur within 5km of the Draft Order Limits, including Local Nature Reserves (LNR) and SSSI's The Humberhead Peatlands National Nature Reserve (NNR) is also located directly adjacent to the Draft Order Limits boundary.

17.4.8. These sites are summarised in **Table 3.1** and are shown on **Figure 2** within **Technical Appendix 7.1**.

17.4.9. The Draft Order Limit is also located within several NE defined Site of Special Scientific Interest (SSSI) Impact Risk Zones (IRZs).

Non-Statutory Designated Sites for Nature Conservation

17.4.10. Fourteen non-statutory designated sites fall within the Draft Order Limits, including 10 Local Wildlife Sites (LWS) and four Candidate Local Wildlife Sites (CLWS). These are all associated with 'drain' watercourses within the Draft Order Limit, except for Whittaker's Plantation CLWS which related to plantation woodland.

17.4.11. A further two LWS, one CLWS and a Lincolnshire Wildlife Trust Reserve (LWT) are located directly adjacent to the Draft Order Limits boundary, with a further 19 LWS, five CLWS and one Local Geological Site (LGS) situated within 2km.

A full list of sites both in and within 2km of the Draft Order Limits can be found in **Annex 2** of **Technical Appendix 7.1** as well as being shown on **Figure 3** of the same appendix

Priority Habitats; Desk Based Records

17.4.12. Eleven Habitats of Principal Importance (also known as priority habitats) as defined under Section 41 of the NERC Act/UK Biodiversity Action Plan are located within 2km of the Draft Order Limits. Of these, three are present within the Draft Order Limits itself (lowland deciduous woodland, hedgerows, and ponds).

17.4.13. Within 2km of the Draft Order Limit boundary, a further 14 habitats listed under the Lincolnshire LBAP and 11 priority habitats under the Doncaster LBAP are also present.

17.4.14. A review of the Woodland Trust Ancient Tree Inventory²⁶ identified no notable trees within the Draft Order Limit. One notable tree was identified within 500m of the Draft Order Limit; a veteran oak situated 40m from the Draft Order Limit boundary (National Tree ID: 10396).

17.4.15. A review of the NE Open Data Geoportal²⁷ identified ancient or irreplaceable peaty soil habitat within the Draft Order Limit. Locations of this are described within Chapter 9; Ground Conditions.

17.4.16. A full list of priority habitats both in and within 2km of the Draft Order Limits can be found in **Table 3.2** of **Technical Appendix 7.1**.

Habitats

17.4.17. Habitats within the Draft Order Limit predominantly comprise arable fields (82.52% of the total area) that are bounded by a combination of deep drains and ditches with some hedgerows, tree lines, grassland field margins. A small woodland copse called Whittaker's Plantation is present within the centre of the Draft Order Limit. Eight ponds are located within the Draft Order Limit,

²⁶ Available at: <https://ati.woodlandtrust.org.uk/> (accessed 06/05/2023)

²⁷ Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::peaty-soils-location-england/explore?location=53.965987%2C-2.238949%2C8.56> (accessed 06/05/2023)

one of which was found to be dry during surveys in spring 2023. A further 33 ponds were identified within 250m of the Draft Order Limits.

17.4.18. The following broad habitat types were recorded within the Proposed Development:

- Arable (UKHab codes: c1.73, c1c, c1d and c1d.78);
- Reedbeds (UKHab code: f2e.11)
- Modified Grassland (UKHab codes: g4, g4.10, g4.10.15, g4.11, g4.115, g4.16, g4.16.56, g4.16.64, g4.17, g4.61, g4.64 and g4.71);
- Hedgerows (UKHab codes: h2a, h2a.10.11, h2a.11 and h3d.16);
- Line of Trees (UKHab code: w1g6);
- Ditches (UKHab code: r1.120.191, r1a.191.117, r1a.191.117.10, r1a.191.117.10.11, r1a.191.120 and r1a.191.120.11);
- Ponds (UKHab code: r1a.19);
- Woodlands (UKHab codes: w1d and w1g.36)
- Scrub (UKHab codes: h3h,); and
- Urban (UKHab codes: u1.11, u1.910, u1c.73, u1e.69, u1e.107, u1e.111 and u1e.115)

17.4.19. Detailed habitat descriptions and target notes (TNs), and associated photographic plates are provided within **Technical Appendix 7.1**. Baseline habitats recorded within the Draft Order Limits are illustrated in **Figures 4A to 4G** of **Technical Appendix 7.1**.

Birds

Desk Study

17.4.20. The GLNP and DoBRC data search returned numerous records of bird species within 2km of the Draft Order Limits, including a variety of species commonly associated with farmland and woodland habitats.

17.4.21. The data search returned 1,580 records for 127 bird species, including 22 species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 17 species listed on Annex 1 of the Directive 2009/147/EC (Birds Directive), 29 Natural Environment & Rural Communities (NERC) Act Section 41 Species, 19 Lincolnshire Biodiversity Action Plan species and 20 Doncaster Local Biodiversity Action Plan birds.

17.4.22. A detailed desk study is presented in the baseline report (**Technical Appendix 7.1**).

Breeding Bird Survey

17.4.23. The breeding bird assemblage recorded within the Draft Order Limits is representative of farmland habitats of the region. A total of 52 species were recorded breeding within the Draft Order Limits, or within 100m of the boundary. Notable species were defined as those Red-listed

or Amber-listed on 'Birds of Conservation Concern 5'²⁸. Twelve Red List²⁹ species (grey partridge, cuckoo, lapwing, skylark, mistle thrush, tree sparrow, house sparrow, yellow wagtail, greenfinch, linnet and yellowhammer) and 15 Amber List species (greylag goose, mallard, stock dove, woodpigeon, moorhen, kestrel, rook, willow warbler, sedge warbler, whitethroat, wren, song thrush, dunnoek, meadow pipit and reed bunting) were identified. Of the 28 notable species, 13 are also listed under Section 41 of the NERC Act (2006)³⁰; (grey partridge, cuckoo, lapwing, curlew, skylark, song thrush, tree sparrow, house sparrow, dunnoek, yellow wagtail, linnet, yellowhammer and reed bunting). In addition, 13 are listed under the Lincolnshire LBAP (grey partridge, cuckoo, lapwing, skylark, willow warbler, song thrush, tree sparrow, house sparrow, dunnoek, yellow wagtail, linnet, yellowhammer and reed bunting) and eight under the Doncaster LBAP (grey partridge, lapwing, skylark, song thrush, tree sparrow, yellow wagtail, linnet and reed bunting).

- 17.4.24. Two species listed within Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded as potentially breeding within and surrounding the Draft Order Limits.
- 17.4.25. The notable species breeding assemblage was typically associated with vegetation along field boundaries, principally hedgerows, scrub, watercourses, treelines, and woodland habitats.
- 17.4.26. Ground-nesting notable species which use open agricultural fields within the Draft Order Limits consisted of greylag goose (one territory), grey partridge (seven territories), lapwing (19 territories), skylark (250 territories), yellow wagtail (91 territories) and meadow pipit (14 territories).
- 17.4.27. Detailed survey results and further confidential breeding bird information regarding species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) is provided in **Technical Appendix 7.2.** and within **Figures 1-10** of the same appendix.

Non-breeding Bird Survey

- 17.4.28. Detailed results of Year 1 are presented in the **Technical Appendix 7.3,** and within **Figures 1-13** of the same appendix. Year 2 surveys commented in September 2023 and will continue until March 2024 and results will be incorporated in to a revised Technical Appendix 7.3.

²⁸ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.* British Birds 114: 723-747. Available at: <https://britishbirds.co.uk/content/status-our-bird-populations> (accessed on 31/05/2023)

²⁹ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.* British Birds 114: 723-747. Available at <https://britishbirds.co.uk/content/status-our-bird-populations> (accessed on 31/05/2023)

³⁰ Available at: <https://www.legislation.gov.uk/ukpga/2006/16/section/41> (accessed on 20/02/2023)

- 17.4.29. Target species consisted of wetland birds such as waders, waterfowl and gulls and Annex 1³¹/Schedule 1³² raptors and owls. Activity within the Draft Order Limits remained low throughout the entire survey period, with Target Species being limited to individuals, pairs and sporadic small flocks. Pink-footed geese were recorded in the largest flocks, both within the Draft Order Limits and flying over it whereby flocks were suspected to be roosting on the adjacent Hatfield Moors Site of SSSI.
- 17.4.30. Target Species recorded within the Draft Order Limits included; whooper swan, mute swan, pink-footed goose, mallard, shoveler, teal, grey heron, little egret, little grebe, lapwing, golden plover, grey plover, green sandpiper, curlew, snipe, woodcock, osprey, red kite, marsh harrier, peregrine, barn owl and little owl.
- 17.4.31. Species associated with the Humber Estuary SPA and Ramsar recorded within the Draft Order Limits included: Mallard, teal, lapwing, golden plover, grey plover, curlew, hen harrier and marsh harrier.
- 17.4.32. Within the Wider Survey Area (WSA) target species comprised: whooper swan, mute swan, pink-footed goose, greylag goose, mallard, shoveler, teal, grey heron, little egret, crane, lapwing, golden plover, green sandpiper, snipe, jack snipe, woodcock, osprey, hen harrier and marsh harrier, peregrine, barn owl, little owl and tawny owl.
- 17.4.33. Golden plover was recorded within the WSA on nine of the 14 survey visits. The peak flock size within the WSA was 480 individuals in field 58. Other flocks of golden plover were recorded within the WSA did not otherwise exceed 100 individuals.
- 17.4.34. Additionally, species associated with the Humber Estuary SPA were listed in the WSA included marsh harrier, hen harrier, lapwing, mallard and teal.

Bats

Desk Study

- 17.4.35. The data received from GLNP and DoBRC returned 28 recent bat records within 2km of the Draft Order Limits.
- 17.4.36. Four bat records were returned within the Draft Order Limits itself, with several others recorded in close proximity to the boundary.
- 17.4.37. A review of MAGIC identified two NE licences granted for bat roosts within 2km of the Draft Order Limits, the closest being 0.96km to the west.

Habitat Assessment: Commuting and Foraging Bats

- 17.4.38. The dominant habitats consist of intensively managed agricultural land, the majority of which (82.52%) is used for arable purposes. Open arable farmland offers negligible-low foraging and commuting potential for bats, and bat activity is considered likely to be concentrated along

³¹ Available at: <https://lists.nbnatlas.org/speciesListItem/list/dr2401> (accessed on 20/02/2023)

³² Available at: <https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wildlife-and-countryside-act/schedules/> (accessed on 20/02/2023)

boundary features such as hedgerows and watercourse networks. Current farming practices, particularly the use of herbicides and pesticides, also mean that low flying invertebrate prey species will likely be limited.

- 17.4.39. Therefore, the predominantly arable habitats throughout the Draft Order Limits and beyond provide little suitability for bats, however, the network of hedges, watercourses, tree lines, watercourses, pond, and occasional woodlands do provide some limited moderate potential opportunities for commuting and foraging. Following current guidance³³, the Draft Order Limits is therefore considered to have low overall commuting and foraging value for bat species.

Habitat Assessment: Roosting Bats

- 17.4.40. One building is present within the Draft Order Limits, which is considered to have low bat roosting potential. In addition, bat boxes and a number of trees within the Draft Order Limits are considered to have bat roosting potential (see **Technical Appendix 7.1**).
- 17.4.41. Woodland parcels within and directly adjacent to the Draft Order Limits generally contain mature trees potentially with bat roosting potential.

Badger

- 17.4.42. Confidential badger information is provided in **Technical Appendix 7.5**.

Otter

- 17.4.43. Confidential otter information is provided in **Technical Appendix 7.6**.

Water vole

- 17.4.44. Detailed results are presented in **Technical Appendix 7.3**.

Desk Study

- 17.4.45. Records of water vole were returned from within the Draft Order Limits and also within 2km. A number of designated sites have water voles listed within their citations including; Hatfield Chase Ditches, which is present within the Draft Order Limits as well as Humberhead Peatlands NNR, which is adjacent to the Draft Order Limits.

Survey Results: Water Vole

- 17.4.46. Surveyed ditch sections were assessed as providing varying suitability for water vole, ranging from sub-optimal to optimal (see **Table 3.1** within **Technical Appendix 7.6**).

³³ Colins, J. (ed). (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971 (accessed on 07/06/2023)

17.4.47. Evidence of water vole was found in one ditch, D3 situated north east of the Draft Order Limits. Evidence included latrines, feed remains and burrows. The water vole detection dog teams recorded no further evidence of water vole during the ditches surveyed in April 2023.

17.4.48. Given the species was recorded during field surveys and therefore confirmed to be present within the Draft Order Limits, a precautionary approach to assessment is adopted whereby water voles are assumed to be present. This approach allows for the likely continual changes in water vole distribution due to on-going ditch maintenance works.

Amphibians

17.4.49. Detailed results are presented in the **Technical Appendix 7.7**.

Desk Study

17.4.50. No amphibian records received were located directly within the Draft Order Limits. Thirty-four records were returned within 2km, including for the species GCN, common toad, smooth newt and common frog.

17.4.51. A data review of MAGIC identified five Natural England licences within 2km, with the closest two date between from 2017–2028 and are situated 1.52km from the Draft Order Limits.

Environmental DNA (eDNA) Sampling Results

17.4.52. EDNA sampling of ponds in 2023 returned negative results for GCN DNA.

Reptiles

Desk Study

17.4.53. Detailed results are presented in **Technical Appendix 7.1**.

17.4.54. The data search identified sixty-one reptile records within 2km of the Draft Order Limits. Species returned comprised grass snake, adder and common lizard.

17.4.55. As detailed in **Technical Appendix 7.1**, multiple non-statutory designated sites situated within 2km of the Draft Order Limits are notable for supporting reptiles' populations including Jone's Cable LWS and River Thorne LWS which are located directly adjacent to the Draft Order Limits boundary.

Habitat Suitability Assessment

17.4.56. The Draft Order Limits is dominated by arable farmland, which is considered to be of a negligible value for reptile species, however, the field boundary habitats such as hedgerows, watercourses and field margins (where present) do potentially provide limited habitats for foraging/hibernation purposes.

17.4.57. The Draft Order Limits has habitat connectivity to similar extensive farmland habitats as well as moorland and heath habitats in the wider landscape. Direct habitat connectivity to woodland/wetland habitats which may support wider populations of reptile species. It is therefore considered that the limited suitable habitats within the Draft Order Limits may potentially support low numbers of reptile species.

White Clawed Crayfish & European Eel

Desk Study

- 17.4.58. Detailed results are presented in **Technical Appendix 7.1**.
- 17.4.59. The data search identified one record of white clawed crayfish within North Soak drain, situated 0.83km from the Draft Order Limits. One record of European eel was returned within Folly Drain, located 1.8km of the Draft Order Limits.

Habitat Suitability Assessment

- 17.4.60. Some drains and ditches forming part of the network of watercourses located within and adjacent to the Draft Order Limits are considered potentially suitable to support these species. However, the majority of ditches contain poor water quality from suspected chemical and nutrient pollution, which in addition to watercourse beds lacking cobbles or stones that are required for refuge, habitat is assessed as being of low value to these species.

Other Priority Species

- 17.4.61. Detailed results are presented in the Detailed results are presented in **Technical Appendix 7.1**.
- 17.4.62. The data search also returned recent records consisting of brown hare, hedgehog, harvest mouse and roe deer within 2km of the Draft Order Limits.
- 17.4.63. The habitats within the Draft Order Limits, most notably the hedgerows, pasture fields, tree-lines, field margins, scrub, watercourses and woodland provide opportunities for brown hare, hedgehog, harvest mouse, polecat and roe deer. It is considered that the intensively managed agricultural fields that dominate habitats within the Draft Order Limits are of poorer habitat quality for mammal species.
- 17.4.64. Brown hare, polecat and hedgehog are listed in England under Section 41 of the NERC Act 2006. Roe deer, brown hare and harvest mouse are further listed under the Doncaster LBAP. None of these species are listed under the Lincolnshire LBAP.

Invertebrates

- 17.4.65. Detailed results are presented in **Technical Appendix 7.1**.
- 17.4.66. The data search returned numerous records of invertebrate species within 2km of the Draft Order Limits including for a range of true fly, moth, butterfly and beetle species as well mud pond snail.
- 17.4.67. Returned notable invertebrate species were all located outside the Draft Order Limits boundary, with most focussed around Thorne Moors and Crowle Common. In addition, a number of designated sites list in vertebrates within their citations including Hatfield Chase Ditches SSSI and Humberhead Peatlands NNR.
- 17.4.68. Almost all of the Draft Order Limits (82.52%) consists of intensively managed agricultural land, of which the majority is used for arable farming purposes. The current management of the land includes the regular application of herbicides and pesticides. These are used to prevent the growth of 'non-crop' vegetation which could potentially support invertebrates. In addition, both

herbicides and pesticides are directly toxic to invertebrates, causing fatality. As such invertebrate populations are likely to be substantially impacted by current land management.

- 17.4.69. Linear habitats within, and surrounding the Draft Order Limits, such as hedgerows, watercourses, ponds and woodland are considered likely to support a more diverse invertebrate community than arable fields, although such features will be retained as part of The Scheme. These communities will also be heavily impacted by existing land management practices, including herbicide and pesticide drift from agricultural fields and manure/fertiliser run-off impacting ditches and ponds.

Invasive Species

Desk Study

- 17.4.70. The records search identified a number of plant species listed within Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) within the search area including Nuttall's waterweed, curly waterweed, water fern, giant hogweed and Japanese knotweed.
- 17.4.71. Records of invasive mammal species included, American mink, muntjac deer and grey squirrel.
- 17.4.72. A number of designated sites also have invasive species listed within their citations including, Stainforth & Kneadby Canal Corridor LWS.

Extended Habitat Survey Results

- 17.4.73. During the extended habitat survey water fern was identified in the South Soak Drain which is located on the Draft Order Limits boundary (as shown as **TN4** on **Figure 4A** of **Technical Appendix 7.1**). Rhododendron was also found within woodland situated adjacent to the Draft Order Limits.

Future Baseline Conditions

- 17.4.74. It is considered that in the absence of The Scheme future ecological baseline conditions will remain relatively static. The majority of the Draft Order Limit would continue to be managed under intensive agricultural crop rotation patterns, with biodiversity interest predominantly limited to existing field boundaries including hedgerow, woodland, scrub and ditch habitats.
- 17.4.75. Biodiversity value may reduce along boundary features such as ditches if the spread of invasive species which have been identified as present, such as Water fern, continues within the Draft Order Limits. In addition, should continued inputs of agricultural chemicals such as fertilisers and pesticides occur, these may also contribute to reduced species diversity and affect water quality of ditches within and adjacent to the Draft Order Limits.

Determining Features to be Scoped-In for Detailed Assessment

- 17.4.76. In accordance with the CIEEM guidance (2018), the assessment only assesses in detail, impacts upon important ecological features i.e., those that are considered important and potentially affected (as set out in Section 7.3 Methodology). It is not considered necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened, and resilient to project impacts and will remain viable and sustainable. Where ecological features are not considered important enough to warrant further consideration, or where they will not be significantly affected, these can be scoped out of the assessment process, and justification for

exclusion is provided. Where a feature has been scoped out of the detailed assessment, measures to protect, enhance or ensure legislative compliance may be included in the ‘mitigation’ section of the ES.

Table 7.7 presents the evaluation of identified ecological features and provides the rationale as to why individual features have been included or ‘scoped out’ of the detailed assessment.

Table 7.7: Importance of Ecological Features

Ecological Feature	Geographic Scale of Importance	Potential Effect Pathways and Rationale for Selection of Features for Detailed Assessment
Statutory Designated Sites	International - National	Due to the location of a number of statutory designated sites including within and adjacent to the Draft Order Limits, the connectivity and mobile nature of some designating features, statutory designated sites for nature conservation have been scoped into the assessment.
Non-Statutory Designated Sites	Regional - Local	Due to the location of a number of non-statutory designated sites including within and adjacent to the Draft Order Limits, the connectivity of ditch networks and mobile nature of species of interest, non-statutory designated sites for nature conservation have been scoped into the assessment.
Habitats	Local	Priority habitats are present within and adjacent to the Draft Order Limits. There is the potential for direct and indirect effects due to the location of these habitats and as a result, habitats have been scoped into the assessment.
Breeding Birds - excluding ground nesting and Schedule 1 species	Regional	Breeding birds were found to be present within the Draft Order Limits during surveys. Habitats are also present which are suitable for breeding bird species, although boundary features such as ditches and hedgerows will be retained and protected during works. As a result, breeding birds (excluding ground

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		nesting and Schedule 1 species) have been scoped into the assessment.
Breeding Birds – Schedule 1 species	National	Schedule 1 species, hobby, was found to be breeding within the Draft Order Limit and Cetti's warbler were recorded on adjacent land. As there is the potential for disturbance during the construction phase Schedule 1 species have been scoped into the assessment.
Breeding Birds – ground nesting species	National – Regional/County	Ground nesting bird species were found to be present within the Draft Order Limits, including skylark, lapwing, yellow wagtail and meadow pipit. There is the risk of disturbance during construction and loss of habitat from operation of The Scheme and as a result, breeding birds – ground nesting species – are scoped into the assessment.
Non-breeding birds (including both over-wintering and passage periods)	Site-Local	<p>Year 1 surveys undertaken found low numbers of target species sporadically spread across fields within the Draft Order Limits.</p> <p>Based on data currently available, small numbers of waterbirds (may be subject to displacement, however, the availability of extensive similar arable habitats within the surrounding landscape is considered likely to mitigate such minor non-significant displacements based on Year 1 data. This position will be revised on completion of Year 2..</p> <p>Scoped into the assessment.</p>
Bats – roosting	Site	Trees are present within the Draft Order Limits, which have varying degrees of bat roosting potential. There are no plans for tree felling on Draft Order Limits. A building is also present within the Draft Order Limits which has

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		<p>low bat roost. However, this will be retained and protected.</p> <p>The Scheme will be informed by an outline Landscape Ecology Management Plan (LEMP)(submitted with the ES Chapter) which will include the provision of artificial bat roosting opportunities, which will increase, enhance and diversify opportunities for roosting. Subsequently there is no identified pathway for an adverse effect from the Scheme.</p> <p>The Scheme and associated works will be legislatively compliant and where necessary subject to a European Protected Species Mitigation Licence, which will ensure that the favourable conservation status of roosting bats species will be maintained.</p> <p>Scoped out of assessment, however, roosting bats are considered within the mitigation section; including to ensure legislative compliance.</p>
<p>Bats – foraging and commuting</p>	<p>Local</p>	<p>The Scheme has been designed to avoid boundary features which provide habitats for foraging bats. The commitment to deliver measurable habitat gains through the BNG process, adoption of sensitive lighting strategies (as detailed within the outline LEMP will be submitted with the PEIR/ES Chapter) and cessation of regular herbicides and pesticide applications associated with the current intensive agricultural land management, will provide benefit to foraging and commuting bat species within the Draft Order Limits and surrounding environment. Subsequently there is no identified pathway for an adverse effect from the Scheme.</p> <p>Scoped out of the assessment, however, foraging/commuting bats are considered within the mitigation</p>

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		section; including to enable legislative compliance.
Badger	Site	<p>Further information is provided in confidential Technical Appendix 7.5.</p> <p>Scoped out of assessment but is considered within the mitigation section; including to enable legislative compliance.</p>
Otter	Local-Site	<p>Further information is provided in confidential Technical Appendix 7.6.</p> <p>Scoped out of the assessment, however, otters are considered within the mitigation section; including to enable legislative compliance.</p>
Water vole	Regional/County	<p>Water voles were found to be present during the first visit of the 2023 water vole survey.</p> <p>Avoidance of ditches/watercourses has been adopted within the overall Scheme design. The commitment to deliver measurable habitat gains through the BNG process will strengthen habitat corridors along ditch networks within the Draft Order Limits, providing increased opportunities for these species if colonisation of the Draft Order Limits in the case of water vole) was to occur. Subsequently there is no identified pathway for adverse effects from the Proposed Development.</p> <p>Scoped out of assessment but is considered within the mitigation section; including to enable legislative compliance.</p>
Amphibians	Local	<p>GCN were found to be likely absent from all ponds surveyed in 2023, with negative eDNA results.</p>

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		<p>All ponds within the Draft Order Limits will be retained and protected. Field boundary features such as hedgerows and ditches will not be impacted by the Scheme. The extensive provision of habitat enhancements through the delivery of BNG will provide increased terrestrial habitat availability for local populations of amphibians.</p> <p>Reasonable avoidance measures (RAMs) for amphibians will be utilised and detailed within the Construction Environmental Management Plan (CEMP).</p> <p>Scoped out of assessment, however, amphibians are considered within the mitigation section; including to enable legislative compliance (GCN).</p>
Reptiles	Local	<p>Much of the Draft Order Limits consists of intensively managed agricultural land, which is largely unsuitable for reptile species, however, linear habitats such as hedgerows, have some suitability and will be retained and protected as part of the outline CEMP, maintaining existing opportunities for dispersal, foraging and shelter. The extensive provision of habitat enhancements through the delivery of BNG along with the cessation of agricultural activities will likely benefit local reptile populations.</p> <p>Protection measures will be implemented to avoid impacts to reptiles, including the adoption of reasonable avoidance measures (RAMs), further details will be provided within the outline CEMP submitted with the PEIR/ES Chapter.</p> <p>Scoped out of assessment but considered within the mitigation section.</p>
Invertebrates	Regional	<p>The Draft Order Limits consist of intensively managed arable land.</p>

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		<p>However, a small area of Thorne & Moors statutory designated sites and Hatfield Chase Ditches SSSI lie within the Draft Order Limits.</p> <p>No infrastructure is proposed within this small area or immediately adjacent to it. With statutory designated sites protected from impacts from The Scheme.</p> <p>Arable farmland has negligible potential for invertebrate species. Aquatic habitats including boundary ditches will be retained and protected.</p> <p>It considered that the commitment to the retention of habitats with ecological value to invertebrates as part of the design and the commitment to deliver measurable habitat gains through the BNG process, and cessation of regular herbicides and pesticide applications associated with the current intensive agricultural land management, there will be a benefit to invertebrate populations within the Draft Order Limits and surrounding environment.</p> <p>Protection measures will be implemented to avoid impacts to invertebrates, including the adoption of reasonable avoidance measures (RAMs), further details will be provided within the outline CEMP submitted with the PEIR/ES Chapter.</p> <p>Scoped out of assessment but considered within the mitigation section.</p>
White Clawed Crayfish & European Eel	Local	<p>One record of white clawed crayfish was returned within the North Soak Drain, approximately 830m from the Draft Order Limits. A record for European eel was returned within the Folly Drain, approximately 1.8km from the Draft Order Limits.</p>

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		<p>Aquatic habitat will be retained and protected during the Scheme thereby maintaining habitat potentially used by these and other aquatic species. Protection measures will be implemented to avoid impacts to aquatic habitat, including the adoption of pollution prevention and control measures to maintain water quality levels. Further details will be provided within the outline CEMP submitted with the PEIR/ES Chapter. Subsequently there is no identified pathway for an adverse effect from the Scheme.</p> <p>Scoped out of the assessment.</p>
Other priority mammals	Site	<p>Brown hare are known to occur within the Draft Order Limits, predominantly field boundary features and woodland habitats, which will be retained and protected. These habitats could also support hedgehog, polecat and harvest mouse, at least on an occasional basis. These species will be protected and avoided as part of the CEMP and significant habitat enhancements will be provided, benefitting local populations; as detailed within the in-line with the outline LEMP, both will be provided with the PEIR/ES Chapter. Roe deer are a local Biodiversity Action Plan species for Doncaster and can utilise a wide range of habitats. With the abundance of habitats in the wider area The Scheme will not impact the favourable conservation status of the species.</p> <p>Scoped out of assessment but considered within the mitigation section.</p>
Invasive Species	Local	<p>Water fern has been recorded within the Draft Order Limits and Pontic rhododendron has been recorded immediately adjacent to the Draft Order Limits.</p>

		<p>Scoped out of assessment but considered in the mitigation section; including to enable legislative compliance.</p>
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Assessment of Likely Significant Effects

17.4.77. Potential effects on ecological features (those scoped into the detailed assessment as detailed in Table 7.7) have been considered. Effects are initially assessed in the absence of specific (non-embedded) mitigation, with residual effects presented thereafter.

Embedded Mitigation

Mitigation and Avoidance by Design

17.4.78. The design of The Scheme includes a range of inherent embedded elements which avoid or reduce the potential for adverse ecological impacts, including retaining identified higher value statutory designated sites as well as habitat features such as, hedgerows, ditches, and woodlands, and focusing the built development proposals within lower ecological value agricultural and pastoral farmland. Buffer distances between development areas and potentially sensitive features have been included to avoid and minimise effects, such as the substation locations being ‘set-back’ from the Thorne and Hatfield Moors SPA to avoid noise disturbance in operation. Additionally, sensitive, or high value ecological features outside the Draft Order Limits have been protected as part of the design which sets in place buffer zones and other safeguarding measures, all of which has been built-in to as part of the iterative design process.

17.4.79. The proposed Landscape Masterplan to be submitted with the next iteration of the PEIR will include extensive embedded habitat creation which will diversify and strengthen the biodiversity interest of The Scheme itself, and neighbouring areas.

Construction Environmental Management Plan (CEMP)

17.4.80. The potential for adverse effects during the construction phase will also be avoided and ‘designed out’ where practicable, and these will be controlled through standard good construction and environmental working practices as an integral part of The Scheme, detailed within the outline CEMP submitted with the next iteration of the PEIR.

17.4.81. An ecologically sensitive approach to construction will be implemented through the CEMP. The outline CEMP will detail measures and approaches to be adopted which will limit the likelihood of impacts upon retained habitats through damage, pollution and disturbance. Habitat protection buffers will be maintained throughout the construction phase, and identified with appropriate fencing and signage along with team briefings at ‘tool box talks’.

17.4.82. The Outline CEMP will describe measures to be implemented during the construction process and may, for example, include commitments to Species Protection Plans, Reasonable Avoidance Measures (RAMs), pre-construction surveys and appropriate derogation licenses as well as pollution (including dust) control, managed construction lighting and noise / traffic management measures.

17.4.83. A suitably qualified and experienced Ecological Clerk of Works (ECoW) (or team of ECoWs) will be appointed prior to the commencement of construction activities and through whom appropriate ecological advice will be provided throughout. The ECoW will be responsible for undertaking and/or co-ordinating checks for protected species before providing confirmation that construction and decommissioning activities can commence. The ECoW will also maintain a watching brief as necessary throughout the construction phase to ensure compliance with relevant legislation, including adhering to any protected species mitigation measures required, such as GCN RAMs. Further information will be provided within the CEMP.

17.4.84. An Outline LEMP will be prepared and submitted with the next iteration of the PEIR which will specify how the habitats within the operational array will be managed. Post-construction site management and monitoring will be specified, designed to reduce interference with created and retained habitats while promoting their establishment and biodiversity contribution. This will contribute to the establishment of coherent ecological networks, supporting the BNG targets of the Environment Act 2021 and the NPS for Energy (EN-1).

17.4.85. It is anticipated that the final details and implementation of the LEMP will be secured by requirement of the DCO which would ensure a detailed LEMP would be finalised once the party responsible for delivering the landscape management within the Draft Order Limits has been appointed.

The Mitigation Hierarchy and Biodiversity Net Gain (BNG)

17.4.86. Compliance with planning policy in the NPPF requires that The Scheme considers and engages a mitigation hierarchy, requiring the highest level to be applied, where possible. The mitigation hierarchy is also fundamental to BNG. There are four sequential steps that must be taken throughout the lifecycle of a project where there is potential for impacts on relevant ecological receptors:

- Avoidance – actions taken to avoid causing impacts to the environment prior to beginning development (for example, moving the development to a different location);
- Minimisation – measures taken to reduce the duration, intensity, extent and/or likelihood of the unavoidable environmental impacts caused by development (for example, adapting the development design to minimise impacts);
- Restoration or rehabilitation – actions taken to repair environmental degradation or damage following unavoidable impacts caused by development; and
- Offsets – measures taken to compensate for any adverse environmental impacts caused by development which cannot be avoided, minimised and/or restored (e.g., including habitat creation to offset losses).

17.4.87. The Scheme's design evolution has sought to (and will continue to) avoid areas of significant biodiversity value, such as field boundary hedgerows and ditch networks. Habitat enhancement measures and ongoing management practices will be proposed in line with guidance published

by the Building Research Establishment (Biodiversity Guidance for Solar Developments³⁴) ('the BRE Guidance') and NE's Technical Information Note TIN101³⁵ that will enhance and safeguard key habitats for the benefit of wildlife and enhance the ecological value of land currently under agricultural use.

17.4.88. The BRE guidance states that:

'with appropriate land management, solar farms have the potential to support wildlife and contribute to national biodiversity targets. Indeed, solar farms may have several additional advantages in that they are secure sites with little disturbance from humans and machinery once construction is complete. Recent research suggests biodiversity gains on solar farms can be significant'

17.4.89. The ES chapter will assess and explain commitments for long-term management of the land for the duration of the project to conserve and improve landscape habitat connectivity with the wider landscape for wildlife through protecting and enhancing potentially important wildlife corridors and habitats. This will contribute to the establishment of coherent ecological networks, supporting the BNG targets of the Environment Act 2021 and the NPS for Energy (EN-1).

17.4.90. Through provision of BNG and the Outline LEMP, The Scheme will deliver habitat enhancements, which will provide a clear benefit for a broad range of dependent species. Further, the removal of land from arable production will lead to a reduction (or complete removal) of agricultural chemical overspray and drift where this currently occurs within the Draft Order Limits. This would lead to improved conditions for terrestrial and aquatic invertebrates, which in turn will benefit dependent species, such as foraging bats or some farmland birds. Water quality and soil health will also likely improve as a result of less intensive farming practices.

17.4.91. This next iteration of the PEIR will therefore also include consideration of the potential benefits of the Scheme.

Construction

17.4.92. Potential construction phase ecological effects associated with The Scheme are considered to relate to:

- Direct land take (habitat loss) to accommodate The Scheme;
- Temporary disturbance and land take for construction, laydown areas and construction compounds (land restored thereafter);
- Disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within and adjacent to the Draft Order Limits; and

³⁴ BRE (2014) *Biodiversity Guidance for Solar Developments*. <https://files.bregroup.com/bre-co-uk-file-library-copy/filelibrary/nsc/Documents%20Library/NSC%20Publications/National-Solar-Centre---Biodiversity-Guidance-for-Solar-Developments--2014-.pdf> (accessed 28/06/2023)

³⁵ Natural England (2011) *Solar Pans; maximising environmental benefits (TIN101)* <https://webarchive.nationalarchives.gov.uk/ukgwa/20150902172007/http://publications.naturalengland.org.uk/publication/32027> (accessed 15/07/2023)

- Disturbance and pollution (indirect effects such as noise and vibration, dust, pollution from surface water run-off) resulting from clearance and construction, plant and vehicles movements and workers' activities.

Statutory Designated Sites

- 17.4.93. A small extent of Thorne & Hatfield Moors SPA, Thorne Moor SAC, Thorne, Crowle and Goole Moors SSSI and Hatfield Chase Ditches SSSI are located within the Draft Order Limits. In addition, Hatfield Moors SAC and Humber Estuary SPA, SAC and Ramsar are situated within 10km of the Draft Order Limits. Each statutory designated site is addressed below in turn.

Thorne & Hatfield Moors SPA

- 17.4.94. This is designated for its population of breeding nightjar.
- 17.4.95. Nightjar surveys of the SPA were undertaken in 2022, as part of ongoing monitoring works for the Tween Bridge Wind Farm. Please refer to **Technical Appendix 7.4** for full details. In summary surveys found 58 churring males in Thorne and Crowle Moors (to the north of the Draft Order Limits), which is the highest number on record since 2017. Surveys of Hatfield Moors (south of the Draft Order Limits) found 52 churring males or territories which is the highest number since survey began in 2005. Surveys were focused within the SPA boundaries but no churring males/territories were noted within the Draft Order Limits or immediately adjacent.
- 17.4.96. No infrastructure development is proposed within the SPA boundary. Habitats within the Draft Order Limits have limited potential for the species, consisting of intensively managed arable farmland, which holds little value as a habitat or foraging resource for this specialist species. Higher value boundary habitats that are likely to support invertebrate species will be retained and protected during works. No moorland habitat was found within the Draft Order Limits and usage by this species is restricted to occasional use as a foraging resource along boundaries that will be retained and protected. Upon completion, the habitat creation and enhancement of The Scheme will benefit a range of species (likely including invertebrates prey species for nightjars) and the change in management will ensure the Draft Order Limits are relatively undisturbed compared to current practices.
- 17.4.97. The potential for likely significant effects upon European sites will be provided within an 'Information to Inform Habitats Regulations Assessment' as part of the next iteration of the PEIR.

Thorne Moor & Hatfield Moors SAC's

- 17.4.98. Both SAC's are designated for their 'degraded raised bogs still capable of natural regeneration'. Hatfield Moors SAC is situated 100m south of the Draft Order Limits. A small section of the northeastern boundary of the Draft Order Limit extends into Thorne Moor SAC. Whilst this small 0.53ha area is included within the Draft Order Limits, no development works are proposed within the SAC. The Draft Order Limits is dominated by intensively managed arable farmland and the habitat survey did not identify any areas of bog habitat. Areas of peat are shown as present within the Draft Order Limits based on geological and Natural England maps. However, no evidence of peat/heath/bog mire communities was recorded during the habitat survey. With no construction activities occurring within the SAC boundaries, including the area within the Draft Order Limits, there will be no direct construction impacts (such as habitat loss or land take) on the SAC.

- 17.4.99. The SAC is linked to the Draft Order Limit by a network of drainage ditches.
- 17.4.100. Construction will proceed in phases and appropriate buffers will be implemented, which will be set out within the CEMP, to separate construction from the SAC. Airborne emissions, including dust during construction, will be controlled through the implementation of the CEMP. Water quality will be managed and controlled, through standard measures to ensure runoff control and pollution prevention and these will also be set out within the CEMP. As a result, indirect impacts on the SAC are **minor adverse** and **Not Significant** during construction.
- 17.4.101. The potential for likely significant effects upon European sites will be provided within an 'Information to Inform Habitats Regulations Assessment' in the final ES Chapter.

Thorne, Crowle and Goole Moors SSSI

- 17.4.102. The SSSI is designated for its lowland raised bog habitat and species it supports, including breeding and wintering birds including nightjar, as well as its invertebrate and fauna communities. The small area of the SSSI lying within the Draft Order Limits comprises 0.53ha of wet woodland with a ground floor layer dominated by bracken.
- 17.4.103. Impacts relating to nightjar and moorland/raised bog habitat are discussed above. The small section of the SSSI which falls within the Draft Order Limits will not be directly impacted by The Scheme. The small section comprises of wet woodland and will be retained and protected. Species associated with the SSSI are largely dependent on moorland habitat and this will not be impacted by The Scheme. Please refer to the relevant species sections including breeding birds, non-breeding birds and invertebrates for a detailed assessment.

Hatfield Chase Ditches SSSI

- 17.4.104. The SSSI is designated for its ditch network and associated species including aquatic flora, water vole and aquatic invertebrates. Ditches associated with the SSSI are situated along the boundaries of the Draft Order Limits, with one section of access track required to cross the SSSI at SE 74529 09095.
- 17.4.105. All ditches will be retained and protected within the Draft Order Limits with minimum buffers of 9m and The Scheme has been designed to avoid the requirement for new crossings or works within ditches wherever possible. A single upgrade to an existing crossing across an SSSI ditch is required to permit construction access. This will utilise an existing crossing point and no in-channel works are proposed.
- 17.4.106. Appropriate measures to protect this and all other SSSI and non-SSSI ditches, including management of runoff and water quality controls will be set out in the CEMP and as a result, there will be no direct impacts on aquatic habitats and species associated with the ditch network and the SSSI.
- 17.4.107. The SSSI ditches are situated within an area of intensive agriculture, which receives regular input of pesticides and chemicals which likely leach into the ditch network, including the SSSI. In addition, habitat creation and enhancement such as species diverse grassland and hedgerow planting as part of the planned habitat creation and landscape planting is likely to benefit a range of species including those associated with the SSSI.

17.4.108. With these embedded protection measures in place, impacts on the SSSI are assessed as negligible magnitude on a receptor of National value and sensitivity, which is **Not Significant**.

Humber Estuary SPA

17.4.109. The SPA is designated for its assemblage of birds including wintering, passage and breeding birds. Birds may use the Draft Order Limits on occasion as part of a wider territory to forage and roost. Habitats which they can utilize include agricultural and arable fields, and if more than 1% of the qualifying number of each individual species is found to be present then this is considered to be functionally linked land. As suitable habitat is present within the Draft Order Limits, there is the potential for likely significant effects.

17.4.110. An assessment on the significant effects upon European sites will be provided within an 'Information to Inform Habitats Regulations Assessment' in the next iteration of the PEIR and a species focused assessment based on Year 1 survey results can be found in Section 7.4 for Non-breeding bird species.

Humber Estuary Ramsar

17.4.111. The Ramsar is designated for its estuarine habitats, populations of grey seals and assemblage of birds including wintering, passage and breeding birds.

17.4.112. Due to the distance of over 6.1km of the statutory site from the Draft Order Limit, The Scheme will not impact estuarine habitats and species such as grey seals. Effects on grey seals and bird species which exclusively use coastal and maritime features will not be adversely affected by The Scheme which is located 6.1km inland. Mobile species such as birds may use the Draft Order Limits on occasion as part of a wider territory to forage and roost. Habitats which they can utilize include agricultural and arable fields and this habitat is present within the Draft Order Limits.

17.4.113. The potential for likely significant effects upon European sites will be assessed within an 'Information to Inform Habitats Regulations Assessment' in the next iteration of the PEIR.

Humber Estuary SAC

17.4.115. The SAC is designated for its estuarine habitats including coastal plain–mudflats and sandflats. It also supports populations of sea and river lampreys as well as grey seals which are qualifying features of the SAC.

17.4.116. No direct impacts are anticipated on the predominantly coastal and maritime habitats and species the SAC supports, due to the separation distance of over 6km. Whilst drains and ditches within and adjacent to the Draft Order Limits could support lamprey species, no records of them were returned within the data search and therefore they are considered unlikely to be present. However, buffers around drains and watercourses as well as measures set out within the CEMP would ensure the habitat is retained and protected suitable to support lamprey and their free movement in the future. No discernable impacts on this SAC or its qualifying interests are considered likely and effects are assessed as negligible and consequently **Not Significant**.

17.4.117. Subsequently overall for statutory designated sites, impacts are currently assessed on a precautionary basis as being of moderate magnitude on receptors of International-Regional/county value and sensitivity, which are consequently **Significant**.

Non-Statutory Designated Sites

- 17.4.118. The Scheme has been designed to retain and protect non-statutory designated sites including Local Wildlife Sites (LWS) and Candidate Local Wildlife Sites (CLWS) both within the Draft Order Limits, adjacent and in the wider area. These largely consist of drains, with one CLWS relating to a retained woodland copse called Whittaker's Plantation, located at the center of the Draft Order Limits. A full list of non-statutory designated sites can be found in **Annex 2 of Technical Appendix 7.1**.
- 17.4.119. All non-statutory designated drains will be retained and protected by minimum 5m buffers. The Scheme will have no direct impact on the drains and these will continue to be managed by the Internal Drainage Board (IDB). Indirect effects such as pollution prevention and surface runoff control measures will be set out within the CEMP.
- 17.4.120. Whittaker's Plantation CLWS will also be retained and protected. Standard measures within the CEMP will be implemented and the proposed works surrounding the non-statutory sites will adhere to *British Standards BS5837:2012 Trees in relation to design, demolition and construction*³⁶ adopting 15m 'buffer zones' in relation to the protection of woodland habitats. These measures will safeguard the CLWS.
- 17.4.121. The Draft Order Limits border an additional two LWS, one Local Wildlife Trust (LWT) and one CLWS and all non-statutory designated sites within and adjacent will have temporary appropriate signage displayed during the construction phase of The Scheme (which will be set out within a CEMP) in order to ensure that accidental damage to habitats within the LWS/CLWS does not occur.
- 17.4.122. The embedded mitigation and good practice measures detailed within the outline CEMP submitted with next iteration of the PEIR will be sufficient to prevent any measurable direct and indirect impacts to non-statutory designated sites.
- 17.4.123. Habitat creation and enhancement for The Scheme, including the cessation of agricultural inputs and run off is likely to improve water quality within the Draft Order Limits and potentially wider area including non-statutory designated drains.
- 17.4.124. Subsequently, impacts will be of negligible magnitude on a receptor of Regional – Local value and sensitivity, which are consequently **Not Significant**.

Habitats

- 17.4.125. The dominant habitats within the Draft Order Limits comprise intensively managed arable farmland of low ecological value; this habitat will be utilised for the large majority of The Scheme.
- 17.4.126. The field boundary hedgerows comprising predominantly of species-poor hedgerows, ditch networks, and grassland field margins as well as ponds and woodland (including Whittaker's Plantation CLWS), represent habitats of higher ecological value, albeit limited in their distribution within and immediately surrounding the Draft Order Limits. These habitats will be largely

³⁶ British Standards Institute. (2012). *BS5837:2012 Trees in relation to design, demolition and construction*

retained and safeguarded as the design of The Scheme has sought to use existing gaps, crossings and field entrances for access.

- 17.4.127. Access tracks for The Scheme will utilise existing ditch crossing points, existing gaps in hedgerows and existing field entrance gates etc. with highly localised disturbance of very short sections of hedgerow surrounding existing access points potentially required (up to approximately 5m wide). The detail of works, where they affect hedgerows or ditches, will be set out in the CEMP along with measures for runoff control and pollution prevention.
- 17.4.128. Any hedgerow removal will be more than compensated for by replacement and extensive new native species hedgerow planting as part of the embedded habitat creation and landscape planting proposed within The Scheme. Embedded avoidance and protection measures incorporated within The Scheme design include the provision of 5m 'buffer zones' either side of hedgerows and ditches, which will be subject to habitat creation during the construction period (this will be detailed within the Outline LEMP provided with the next iteration of the PEIR), thereby protecting and enhancing the ecological capacity of these linear features.
- 17.4.129. The construction of solar farms requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground) for the infrastructure. Direct loss of habitat associated with The Scheme will be small within the overall Draft Order Limits, and will comprise almost entirely low ecological value arable land.
- 17.4.130. Effects during construction relate to physical disturbance, primarily comprising temporary compaction and soil disturbance from plant machinery and vehicles in addition to the loss of arable and replacement by permanent meadow/grassland habitat. This disturbance will be temporary during the construction phase. Given the low ecological value of this arable land, existing levels of periodic disturbance due to cropping and ploughing, and its prevalence within the local landscape, the loss of arable land and associated disturbance largely replaced by permanent grassland/meadow habitat beneath and around solar panels is considered to be a low (positive) magnitude impact which will result in long-term beneficial effects (**Not Significant**) in terms of biodiversity and habitat provision.
- 17.4.131. An underground cable network will provide infrastructure connections across the various land parcels. This work will be largely focused within existing arable land and installed by open trench excavation. Where the connections are required across existing key infrastructure such as roads and railway lines as well as IDB watercourses and the Stainforth & Keadby Canal, these will be crossed below ground at depth adopting the trenchless approach. Method statements for this work addressing matters such as launch and exit points, along with measures for pollution prevention and control will be provided within the next iteration of the PEIR and the Outline CEMP.
- 17.4.132. The layout of The Scheme has been designed to maintain a stand-off buffer of at least 15m wide between the solar layout and woodland (Whittaker's Plantation CLWS). Access routes will also avoid impacts to existing mature hedgerow trees and will adhere to British Standards BS5837:2012 *Trees in relation to design, demolition and construction*. Woodland buffer zones will be subject to habitat enhancements (as detailed within the Outline LEMP provided with the final ES Chapter) which will serve to complement and strengthen the woodland area over the long-term lifetime of The Scheme.
- 17.4.133. Thirty-meter buffers will be maintained surrounding the ponds within and adjacent to the Draft Order Limits during the construction process, with a range of habitat enhancements to be

provided within this buffer (as part of the delivery of BNG, habitat creation and the landscape scheme, for the benefit of species associated with these water bodies and the wider Scheme biodiversity value.

- 17.4.134. Existing modified grassland field margins (where present) will be temporarily impacted by The Scheme construction activities, however, these will be enhanced and extended, with the provision of grassland field margin planting surrounding solar parcels throughout the Draft Order Limits.
- 17.4.135. Construction of The Scheme will generally occur in daylight hours and working areas will not be lit, thereby maintaining dark corridors across the entire Draft Order Limits, including along boundary habitats such as ditches/drains, woodland edges and hedgerows. Where temporary, limited task lighting is a requirement at any point during the phased construction period such as during late afternoon in winter (when bats are inactive), measures for the selection, use and alignment of temporary lighting to minimize the risk of illuminating wildlife movement corridors and to prevent light spill will be set out in the CEMP, and will be informed by current guidance provided within *Bats and Lighting in the UK: Bats and the Built Environment Series* (BCT. 2018)³⁷
- 17.4.136. Direct and indirect impacts to habitats within the Draft Order Limits and on neighbouring habitats are assessed as negligible–minor adverse during construction and therefore **Not Significant**.
- 17.4.137. Beneficial effects will result from the replacement of lower value arable land by more diverse permanent meadow/grassland and other habitats which will deliver positive long–term change. The change in land management from regular ploughing, will also facilitate carbon capture with implementation of undisturbed grassland. The commitment to deliver measurable BNG gains through wide–scale habitat enhancements and new habitat creation within the Draft Order Limits as part of the design and construction process (as detailed within the Outline LEMP). The Scheme will deliver clear habitat enhancements, resulting in biodiversity gains within the Draft Order Limits and the wider environment.
- 17.4.138. Subsequently, overall impacts to habitats will be of high (positive) magnitude on a receptor of Local value and sensitivity, which are consequently **Significant beneficial effect**.

Breeding Birds –excluding ground nesting and Schedule 1 species

- 17.4.139. The breeding bird assemblage (excluding ground nesting and Schedule 1 species) recorded within the Draft Order Limits is typically representative of farmland habitats, and such species almost exclusively utilise field boundary features for nesting.
- 17.4.140. Potential effects on birds during construction include the temporary loss of nesting opportunities (but only if construction takes place during the breeding season) through minor hedgerow removal or foraging habitat, directly within the Draft Order Limits, or indirectly within adjacent areas through disturbance.

³⁷ Institution of Lighting Professionals / Bat Conservation Trust. (2018). *Guidance Note 08/18 Bats and artificial lighting in the UK Bats and the Built Environment series*.<https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349>

- 17.4.141. Local bird populations will be expected to have become tolerant to existing background activity and disturbance from normal farm operations and local infrastructure (road etc.). Construction disturbance will be short term, undertaken in phases (i.e. not the whole Draft Order Limits at one time), and confined to land within the Draft Order Limits. The layout design includes suitable protection buffers around woodland, hedgerows and ditches which serve to separate potentially disturbing activities from locations most likely to be used by birds for foraging, shelter or breeding. These features will be retained and therefore available to nesting/foraging birds throughout the construction phases.
- 17.4.142. Disturbance during construction is likely to result in temporary displacement of breeding birds within or adjacent to active working areas (i.e. during individual phases of work where this occurs within the breeding season). This is considered to be minor adverse in the context of the availability of extensive nesting habitat locally and the overall retention/creation/enhancement of habitats suitable for nesting bird species within the embedded design.
- 17.4.143. Subsequently, overall impacts to breeding bird species will be of minor adverse magnitude on a receptor of Regional value and sensitivity, which are consequently **Not Significant**.
- Breeding Birds – Schedule 1 species*
- 17.4.144. During surveys, one hobby territory was found within the Draft Order Limits and two Cetti's warblers were found within the wider survey area. Please refer to **Technical Appendix 7.2** and **Figure 11** within the Technical Appendix for further detail.
- 17.4.145. Works will be entirely on land within the Draft Order Limits and habitat in the wider area will not be directly impacted by The Scheme. Trees, hedgerows, woodland and other boundary features within the Draft Order Limits will be retained and protected thereby maintaining features likely to be used by these and other species. As a result, these Schedule 1 species will not experience direct adverse impacts resulting from habitat loss during construction.
- 17.4.146. These species may be subject to disturbance impacts if undertaken during the breeding season and if Schedule 1 species hobby or Cetti's warblers are breeding nearby. To safeguard these birds and ensure legislative compliance, suitable protection measures will be included as part of the LEMP and CEMP, including pre-commencement surveys (repeated as necessary for different construction phases) and the implementation of targeted Bird Protection Plans including buffer zones if Schedule 1 species are found to be nesting in the vicinity of construction works. Such measures will be mandatory to ensure legislative compliance. Further description of these measures can be found within the Section 7.15 of this PEIR. .
- 17.4.147. Habitat creation/retention/enhancement and changes in the land management regime will benefit Schedule 1 species including hobby and Cetti's warbler, through increased foraging resources and potentially new nesting habitat which will form part of the embedded habitat creation and landscape planting elements of The Scheme.
- 17.4.148. However, overall impacts to breeding birds – Schedule 1 species will be minor adverse magnitude on a receptor of Regional/County value and sensitivity, which is consequently **Not Significant**.

Breeding Birds – ground nesting species

- 17.4.149. Breeding bird surveys carried out in 2022 and 2023 found the following territories within the Draft Order Limits; 250 skylark, 91 yellow wagtail, 19 lapwing, 14 meadow pipit, 7 grey partridge, and 1 greylag goose. Further territories were found within the wider survey area and are detailed within **Technical Appendix 7.2**.
- 17.4.150. Whilst construction of The Scheme will be staggered, with different parcels of land starting construction at different times, there is the potential for disturbance and the loss of open habitat which these species require for breeding. This will be temporary (2.5 years overall) and it should be noted that upon completion of active construction, the long-term availability of habitat and new planting, including the creation of open areas of species diverse grassland and with the cessation of chemical applications leading to increased invertebrate resources, will provide enhanced foraging opportunities across the Draft Order Limits.
- 17.4.151. Ground-nesting species will be deterred from breeding in the vicinity of the different phases of construction activities, where these occur during the breeding season, due either to land take or associated disturbance such as noise and/or human activity. This impact will be of limited duration during the phased periods of construction.
- 17.4.152. Certain ground-nesting species will also be deterred from nesting under the constructed solar panels over the long-term, as they require open ground and clear sightlines. As a result, the number and distribution of breeding territories within The Scheme is expected to change as a result of construction. It is noted that the numbers of pairs, and breeding success of ground nesting species under pre-existing agricultural management also varies depending on the year-to-year variations in the cropping regime (with some crops, or the timing of sowing or harvesting effectively preventing either nesting or successful rearing of young).
- 17.4.153. Given the numbers of territories of ground-nesting species such as skylark recorded across the Draft Order Limits during surveys, it is considered that the impact of construction-related displacement of such species will be major adverse magnitude on a receptor of National-Regional/County value and sensitivity, which is **Significant** in the absence of mitigation.
- Non-breeding birds*
- 17.4.154. Based on the Year 1 survey results, the non-breeding bird assemblage recorded within the Draft Order Limits is typically representative of farmland habitats.
- 17.4.155. The Humber Estuary SPA is situated 6.14km away. Of its target species, during Year 1 seven were recorded within the Draft Order Limits; marsh harrier, hen harrier and golden plover as well as water birds; teal, mallard, grey plover and lapwing.
- 17.4.156. The Draft Order Limits include Tween Bridge Farm, which is an operational wind farm with 22 turbines. It is therefore considered that this northern section of the Draft Order Limits is already impacted for non-breeding birds due to displacement caused by the presence of the turbines.
- 17.4.157. A preliminary assessment of significance has been undertaken to determine if the Draft Order Limits have been used regularly by 1% of the biogeographical population of each migratory species (during Year 1 surveys). Of those recorded, golden plover was the only species recorded over this 1% threshold on a single occasion during the survey period with a flock of 480 in field 58 which is adjacent to the west of the Draft Order Limits (i.e. outside The Scheme). As this was for a single species and only on one occasion (i.e. not regular use), then it is considered that the Draft Order Limits and surrounding area do not classify as functionally linked land for the

Humber Estuary SPA based on Year 1 data. The ES will provide a full assessment based on combined Year 1 and Year 2 data..

- 17.4.158. Potential impacts on non-breeding birds include disturbance during construction for non-breeding bird species.
- 17.4.159. Field boundaries including ditches, drains and hedgerows will be retained and protected and these habitats will be enhanced as part of the embedded mitigation, with species diverse grassland along field margins and hedgerow planting. Details including management practices will be set out within the CEMP and LEMP. Ditch habitats will be retained and therefore remain available for water birds such as mallard and teal, and hen harrier and marsh harrier will be able to continue to hunt along field boundaries, which will be enhanced. As a result, impacts to mallard, teal, hen harrier and marsh harrier will be minor (positive) magnitude on a receptor of National-Regional/County value and sensitivity, which is consequently Not Significant.
- 17.4.160. The Scheme will result in the loss of open arable land that species such as golden plover, lapwing and pink-footed geese may utilise; however the use of the Draft Order Limits by such species during surveys was consistently low (see **Technical Appendix 7.3**). Open arable farmland will be almost entirely replaced with species diverse grassland and solar panels which will prevent such species using these areas. Small areas within the Draft Order Limits that do not contain solar panels will remain available for non-breeding bird species, and disturbance of these areas will be limited with appropriate management practices in place which will be set out in the CEMP and LEMP.
- 17.4.161. As a result, overall impacts to non-breeding birds including golden plover, lapwing and pink-footed geese will be minor adverse magnitude on a receptor of County value (due to low numbers recorded) and sensitivity, which is consequently **Not Significant** in the absence of mitigation. This preliminary position will be revised on completion of Year 2 surveys.

Operation

- 17.4.162. Operational effects are defined as effects following the construction of The Scheme. Operational effects generally relate to the change to land use and/or operational disturbance of habitats or species within or adjacent to the Draft Order Limits, on either a temporary or permanent basis. Some effects may reduce with habituation or remain for the lifetime of The Scheme.
- 17.4.163. There are no operational effects relating to land take or habitat loss additional to those already addressed under Construction.

Statutory & Non-Statutory Designated Sites

- 17.4.164. There will be no operational negative effects on any designated sites over and above those described in the Construction section above. It is considered that with the management of habitats, implementation of buffers and good practice measures (as will be detailed within the LEMP and CEMP), habitat connectivity between and around these sites and with habitats in the wider environment will create a larger, stronger, and more ecologically resilient natural corridors in the landscape compared to the current baseline (which comprises intensively managed farmland with limited connectivity apart from hedgerows and ditches which are also retained as part of the operational Scheme). Land, habitats and landscape planting under and around the solar panels and other above ground infrastructure will be managed throughout the lifetime of

The Scheme in accordance with the LEMP/Biodiversity Management Plan to deliver biodiversity benefits and enhanced natural habitats. These benefits will therefore be long-term.

- 17.4.165. Designated sites within and adjacent to The Scheme will benefit from enhanced habitat connections, opportunities for species dispersal within the Draft Order Limits subject to very low levels of disturbance and the cessation of soil disturbance (ploughing) and inputs of agricultural chemicals to waterways and wetlands.
- 17.4.166. An assessment on the significant effects upon European sites will be provided within an 'Information to Inform Habitats Regulations Assessment' in the final ES Chapter for Thorne & Hatfield Moors SPA and the Humber Estuary SPA and Ramsar.
- 17.4.167. Impacts to Thorne Moors SAC, Hatfield Moors SAC, Thorne, Crowle & Goole Moors SSSI, Hatfield Chase Ditches SSSI and Humber Estuary SAC as well as non-statutory designated sites will be of medium (positive) magnitude on a receptor of International/European - Local value and sensitivity, which are consequently a **Significant** beneficial effect.
- 17.4.168. The Scheme will result in the cessation of these agricultural inputs along with the regular soil exposure and disturbance through cropping and ploughing, and hence is likely to improve water quality both within the Draft Order Limits and wider area over time.

Habitats

- 17.4.169. BNG will be delivered through habitat enhancements embedded within The Scheme and provided initially as part of the post construction phase, and thereafter maintained and managed throughout the operational lifetime of The Scheme. This will include the creation of new habitats of ecological value, such as species diverse grassland and hedgerow planting.
- 17.4.170. Liaison is ongoing with Doncaster Council regarding aspirations for the area to be designated as a 'biosphere reserve'. Details and results of this consultation will be included within the next iteration of the PEIR, along with an assessment of the potential for impacts on any such designation.
- 17.4.171. During the operational period the new and existing semi-natural habitats within the Draft Order Limit boundaries will be subject to long-term management by suitably qualified/experienced professionals, informed by a regular ecological monitoring programme and biodiversity objectives during the operational project lifespan. Habitat management will be informed by a detailed LEMP; outline information will be provided within the next version of the PEIR and subsequent ES.
- 17.4.172. The operational Scheme will be subject to very low levels of human activity, with disturbance, restricted to occasional maintenance and inspections. The LEMP will however include protection measures to safeguard priority habitats such as woodland and hedgerows during such activities.
- 17.4.173. The Scheme will include the management of retained and new habitats informed by the LEMP, with the objective creating more diverse, resilient and connected habitat networks of biodiversity value (measurable via BNG), enhancing ecological connectivity between The Scheme and the wider landscape, including nearby designated sites.

17.4.174. These enhanced habits will be maintained over the lifetime of the Scheme, thereby providing long-term stable resources for a variety of other species to move through the landscape, forage, breed and find shelter.

17.4.175. Subsequently, impacts to habitats during the operational phase will be of high (positive) magnitude on a receptor of Local value and sensitivity, which are consequently **Significant beneficial** effect.

Breeding Birds – excluding ground nesting and Schedule 1 Species

17.4.176. Once constructed, The Scheme will be fenced and there will be limited disturbance, noise or lighting associated with the Proposed Development. The operational solar facility will not be lit, with lighting for example typically restricted to the entrance doorways of the small number of structures that require occasional maintenance visits, and designed to minimize light spill. The operational Scheme is likely to result in less overall human activity and disturbance than is associated with current normal farming practices, to which local bird populations have already become relatively tolerant. Periodic cleaning and maintenance of PV modules will take place outside of the nesting bird season (generally March–August inclusive), where practicable.

17.4.177. There would be no additional habitat loss (and hence loss of potential breeding areas) over and above that assessed under Construction. The creation and enhancement of habitats as part of the Scheme, will create habitats favourable to bird foraging and breeding.

17.4.178. New bird boxes to be provided (suitable for a range of species) as part of The Scheme and overall provisions for biodiversity, will also increase foraging opportunities for breeding birds, with extensive species-diverse grasslands, for example, likely to attract greater numbers of insect prey. These will be secured through the LEMP.

17.4.179. As a result, operational effects of The Scheme on breeding birds (excluding Schedule 1 and ground nesting species), once new planting and habitat creation have established, are assessed to be of low (positive) magnitude on a receptor of Regional/County value and sensitivity, which is beneficial but **Not Significant**.

Breeding Birds – Schedule 1 species

17.4.180. Once under operation the solar farm will have limited noise and lighting and be relatively undisturbed except for management of livestock and maintenance and cleaning of the infrastructure.

17.4.181. No further habitat loss will occur during operation above that already assessed in relation to construction. Habitat creation and enhancement will increase opportunities for Schedule 1 species hobby and Cetti's warbler through increased foraging opportunities and potentially breeding habitat provision.

17.4.182. As a result, operational effects of the Scheme on Schedule 1 species hobby and Cetti's warbler, once habitats are established, is assessed to be of low (positive) magnitude on a receptor of Regional/County value and sensitivity, which is beneficial but **Not Significant**.

Breeding Birds – ground nesting species

- 17.4.183. No further habitat loss (in relation to breeding opportunities and nest locations) will occur during operation than that previously identified and assessed under construction. Foraging resources across the Draft Order Limits for ground nesting species present both within the Draft Order Limits and on neighbouring land will be enhanced through the creation of extensive species diverse grassland, with associated increased availability of seeds and invertebrate prey. This has been illustrated by studies by the RSPB (2020)³⁸, Montag et al. (2016)³⁹ and Solar Energy UK (2023)⁴⁰. These studies gathered empirical evidence on bird–usage of solar farms. Both studies consistently recorded skylarks present; foraging and singing within operational solar farms (in fact as one of the most abundant species recorded), with skylarks also confirmed as nesting in field margins within one operational solar site. However, there is no evidence of regular nesting by skylarks within operational solar farms and it is likely that this species would be displaced in the absence of mitigation.
- 17.4.184. As a result, the impact of operational–related displacement of ground nesting species including skylark will be major adverse magnitude on a receptor of National–Regional/County value and sensitivity, which is **Significant** in the absence of mitigation,

Decommissioning

- 17.4.185. Draft Order Limit baseline conditions are likely to change over the likely 40 years of operation, and prediction of these conditions at this point is considered unreliable in terms of predicting likely future decommissioning effects on biodiversity. However, potential impacts from decommissioning are considered to be similar to those already described in relation to the construction phase, namely direct and indirect disturbance, temporary/permanent habitat loss and vegetation removal. Updated ecological desk study and species–specific surveys will therefore be necessary prior to decommissioning in order to record the presence of protected and notable species and habitats, identify potential effects and any necessary protection and mitigation measures in order to comply with planning policy and wildlife legislation applicable at the time.
- 17.4.186. Long term land management within the Draft Order Limits post decommissioning phase will be largely based and managed in adherence to agricultural / land management government policies and agri–environment grant opportunities available at that time.
- 17.4.187. A Decommissioning Environmental Management Plan (DEMP) (secured by requirement of the DCO which would be finalised once the party responsible for undertaking decommissioning works on the Draft Order Limit has been appointed) will form an integral element of the decommissioning phase. This will set out the methods by which decommissioning will be

³⁸ RSPB (2020) *Bird Use on solar farms, final results*

<https://community.rspb.org.uk/ourwork/b/science/posts/bird-use-on-solar-farms-final-results> (accessed 10/07/2023)

³⁹ H. Montag, G Parker & T. Clarkson. 2016. The Effects of Solar Farms on Local Biodiversity; A Comparative Study. Clarkson and Woods and Wychwood Biodiversity. Available online at:

http://www.clarksonwoods.co.uk/news/news_solarresearch.html (accessed 10/07/23)

⁴⁰ Solar Energy UK (2023) *Solar Habitat; Ecological trends on solar farms in the UK* Solar Energy UK.

Available online at: https://solarenergyuk.org/wp-content/uploads/2023/05/Solar-Energy-UK_-Habitat-Report-2023.pdf (accessed 10/07/23)

managed to avoid, minimise, and mitigate any adverse effects on the local and wider environment. Further information is provided below.

17.5. Mitigation, Enhancement and Residual Effects

Mitigation by Design

17.5.1. The design of The Scheme includes a range of inherent embedded elements which avoid or reduce the potential for adverse ecological impacts, including retaining existing identified higher value habitat features such as hedgerows, ponds, ditches, and woodlands, and focusing the majority of the development proposals within lower ecological value agricultural land. Additionally, sensitive, or high value ecological features outside the Draft Order Limits have been protected as part of the design which sets in place buffer zones and other safeguarding measures, all of which has been built-in to as part of the iterative design process.

Construction

17.5.2. The potential for adverse effects during the construction phase have also been 'designed out' where practicable, and these will be controlled through standard good construction and environmental working practices as an integral part of The Scheme, detailed within the CEMP.

17.5.3. Habitat protection buffers will be maintained throughout the construction phase and will be implemented as part of a CEMP, and identified with appropriate fencing and signage along with team briefings at 'tool box talks'.

17.5.4. A suitably qualified and experienced ECoW will be appointed prior to the commencement of construction activities and through whom appropriate ecological advice will be provided throughout. The ECoW will be responsible for undertaking and/or coordinating checks for protected species before the various phases of construction and decommissioning activities commence. The ECoW (or appointed 'clerk' on behalf of the ECoW) will also maintain a watching brief and advisory role as necessary throughout the construction phase to ensure compliance with relevant legislation. Further information will be provided within the CEMP.

Breeding Birds – All species

17.5.5. The design of The Scheme includes a range of inherent measures designed to avoid impacts to nesting bird populations, including the retention of field boundary habitat features, such as hedgerows, ditches, and woodlands.

17.5.6. A possible effect of construction is the direct impacts to nesting birds through disturbance to species associated with field boundary habitats and direct impacts to ground nesting species, if works are undertaken in the breeding season (March to August inclusive). The Environmental Statement will consider the options of the scheme being constructed through either a single phase or a multiple of phases (i.e., phased approach to the construction of the solar arrays / development parcels). If all elements were constructed at the same time, then construction would last up to 30 months. Alternatively, the construction of the Scheme would coincide with the phased connection dates from National Grid. All variances will be assessed within Chapter 7 of the ES. It is likely that not all of the Draft Order Limits would be subject to disturbance at the same time. In order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), vegetation removal within phased construction areas should take place outside of the bird breeding season. If vegetation

works (including any crop removal required to facilitate development) are necessary during the breeding season, any suitable nesting habitat to be affected by works will be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the corresponding legislation. Nesting bird checks may need to be repeated during different phases of work or at different times during the nesting bird season, depending on the timing of construction activities. Further information relating to the protection of breeding birds will be provided within the CEMP.

17.5.7. An area to the north of Stainforth & Keadby Canal will be enhanced for the use of birds (both breeding and wintering). In addition, a variety of artificial nesting features (generally boxes but using a variety of designs attractive to different species) will be added within existing habitats, such as on mature trees, within the hedgerow network and across woodland; ensuring that bird species have a wide variety of increased long-term nesting opportunities right across the Draft Order Limit. These enhancements will be detailed within the Outline LEMP (provided with the next iteration of the PEIR and the final ES Chapter submission), however, these will include the following:

- At least five barn owl nest boxes will be installed on a suitable mature trees within the Draft Order Limits, away from main roads;
- At least five kestrel nest boxes positioned in woodland/mature hedgerow trees located within the Draft Order Limits; and
- At least 60 small open-fronted and hole-fronted nest boxes of various design, positioned within existing hedgerow and trees within the Draft Order Limits;

Breeding Birds – Schedule 1 species

17.5.8. Nesting bird checks will also include visual searches for Wildlife and Countryside Act Schedule 1 species known or suspected to have previously nested within or immediately surrounding the Draft Order Limits, including hobby and Cetti's warbler. These species have elevated levels of legal protection which protects the species from disturbance-related offences. Any suitable nesting habitat to be affected by works during the nesting season will be checked by a suitably experienced ecologist prior to works commencing and set out within the CEMP. Works would be permitted to proceed only when the ecologist is satisfied that no disturbance-related offences will occur under the legislation, with appropriate protection measures set in place as necessary and supervised by the ECoW.

17.5.9. Scrub planting for the Scheme may increase breeding habitat provision for Cetti's warbler. The Scheme is likely to increase foraging opportunities for Schedule 1 species, including hobby and Cetti's warbler with the habitat creation and enhancement measures proposed, such as insect hotels and beetle banks, which in turn may attract small mammals.

Bats – Roosting

17.5.10. Trees and the building present within the Draft Order Limits will be retained, protected during construction, and incorporated into the overall design. If plans change and trees and/or building require removal/felling as part of The Scheme (for instance to aid access requirements or for health and safety purposes), prior to removal, in accordance with current Bat Conservation Trust

(BCT) guidance⁴¹ trees/building will be subject a preliminary roost assessment (PRA). This will assess the potential to support roosting bat species. Trees/building with moderate or high roost potential or building with low potential will be subject to a detailed climbing inspection and/or emergence/re-entry surveys in the appropriate season. If bats are confirmed roosting, no works will take place until a European Protected Species Mitigation Licence (EPSML) licence (issued by Natural England) has been issued and necessary mitigation measures set in place under the supervision of a licensed ecologist. This will ensure there are no adverse impacts on roosting bats and will maintain the favourable conservation status of the roosting bat species in the wider environment.

- 17.5.11. If works on trees with low bat roosting potential are necessary, these will be felled using reasonable avoidance measures (RAMs). In line with BCT guidance; the trees will be soft felled in sections and then lowered to the ground and left overnight (not stacked) before removal. Should a bat (or nesting bird) be found during this process then works will cease immediately and an ecologist contacted immediately for advice.
- 17.5.12. These above measures will ensure there are no adverse impacts on roosting bats and will maintain the favourable conservation status of the roosting bat species in the wider environment.
- 17.5.13. Further information regarding bat roost protection will be provided within the outline CEMP.
- 17.5.14. Additional bat roost provision will be made through the inclusion of a minimum of 60 bat roost boxes on suitable mature and semi-mature trees along field boundaries and within the woodland within the Draft Order Limits. Boxes will be erected in suitable habitats, at an appropriate height (ideally above 4m in height) and with clear flight paths to utilise field boundary features. These enhancements will be detailed within the Outline LEMP (provided with the final ES Chapter submission).

Bats – Foraging and commuting

- 17.5.15. The field boundary habitats comprising predominantly of species-poor hedgerows, ditch networks, as well as ponds and woodland will be retained and therefore direct impacts on commuting/foraging bats avoided.
- 17.5.16. The majority of construction works are unlikely to continue past sunset. However, during the late afternoon in the winter months, and where works are required after sunset, measures will be put in place to manage temporary lighting used within the Draft Order Limits during the construction phase. This will be set out within the CEMP and informed by current guidance provided within *Bats and Lighting in the UK: Bats and the Built Environment Series* (BCT, 2018⁴²) to avoid the potential for construction-related impacts from lighting.

⁴¹ Colins, J. (ed). (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn).

https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971 (accessed on 07/06/2023)

⁴² Institution of Lighting Professionals / Bat Conservation Trust. (2018). *Guidance Note 08/18 Bats and artificial lighting in the UK Bats and the Built Environment series*. <https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349> (accessed 08/05/2023)

- 17.5.17. Indirect impacts to retained foraging/commuting habitats and associated invertebrate prey of foraging bats as a result of construction related pollution (such as airborne dust impacts and surface water runoff) will be managed through adopted measures detailed within the CEMP.
- 17.5.18. Extensive permanent habitat enhancement measures implemented as part of the construction process (as compared to current seasonal cropping regimes), will provide enhanced foraging opportunities for a variety of bat species. The increase in flying insect prey which will result from the long-term habitat changes across The Scheme and associated cessation of application of agricultural chemicals will increase the foraging value and the wider connectivity of the Draft Order Limits in the wider area for foraging bat species, thereby and reducing the reliance of bats on existing narrow linear field boundary habitats within this area.

Badger

- 17.5.19. Confidential badger information is provided within **Technical Appendix 7.5**.
- 17.5.20. The Scheme layout has been designed to avoid impacting habitats potentially used by badgers for foraging and commuting (predominantly field boundary features and woodland). These habitats will be retained and protected. As the solar panels are raised off the ground, and the perimeter security fence will incorporate suitable gaps/badger gates at the base to allow free movement of badgers, no habitat loss or severance effects will result. Habitat interest for badgers is likely to increase across the Draft Order Limits due to enhanced foraging opportunities and lack of disturbance.
- 17.5.21. Badger activity can show seasonal variation and badgers can quickly establish new setts. Considering the highly mobile nature of badgers and the seasonality of their activity, a pre-construction badger survey (within 30m of the Draft Order Limits, where access allows) will be completed by a suitably qualified ecologist immediately prior to the commencement of development/clearance works to determine levels of badger activity and to check for any newly constructed setts in and surrounding the Draft Order Limits.
- 17.5.22. If baseline conditions have altered and significant disturbance to badgers or their setts cannot be avoided, one or both of the following options will be incorporated:
- The development design will be further amended to avoid works which may impacts on the sett; and/or,
 - A disturbance/mitigation licence will be obtained from NE before construction commences.
- 17.5.23. Further information regarding badger protection will be provided within the outline CEMP.

Otter

- 17.5.24. Confidential otter information is provided within **Technical Appendix 7.6**.
- 17.5.25. The area for The Scheme layout has been designed to avoid impacting habitats potentially used by otters including watercourses, drains, ponds and connected woodland and field boundaries. The Scheme will be largely undisturbed and gaps at the bases of fencing as described in relation to badgers will also be available for otters, thereby maintaining dispersal and movement opportunities both overland and along waterways. No works are proposed within watercourses and connectivity both within the Draft Order Limits and wider area will be maintained.

- 17.5.26. Otter activity can show seasonal variation and otters can quickly establish new resting places/holts. Considering the highly mobile nature of otters and the seasonality of their activity, a pre-construction otter survey (within 100m of the Draft Order Limit, where access allows) will be completed by a suitably qualified ecologist immediately prior to the commencement of development/vegetation clearance phased works to determine levels of activity and to check for any newly constructed resting places/holts in and surrounding working areas.
- 17.5.27. If baseline conditions have altered and significant disturbance to otters or their resting places/holts cannot be avoided, one or both of the following options will be incorporated:
- The development design will be further amended to avoid works which may impacts on the resting place/holt; and/or,
 - A disturbance/mitigation licence will be obtained from NE before construction commences.
- 17.5.28. Further information regarding otter protection will be provided within the outline CEMP.
- Water vole*
- 17.5.29. Water voles have been found within the Draft Order Limits. Information is provided within **Technical Appendix 7.6.**
- 17.5.30. The Scheme layout has been designed to avoid impacting habitats potentially used by water vole including watercourses and ditches, with minimum 5m buffers adopted and access tracks utilising existing crossing points. No works are proposed within watercourses and connectivity both within the Draft Order Limits and wider area will be maintained.
- 17.5.31. As a precaution, if construction works are required within 5m of a ditch, these will be preceded by a pre-construction water vole survey. This will be completed by a suitably qualified ecologist prior to the commencement of construction works to determine the presence/likely absence of the species.
- 17.5.32. Should signs of water vole presence be confirmed, works in or adjacent to the ditches will only proceed under suitable mitigation measures as advised by the project ecologist and, if necessary, under a Mitigation Licence issued by NE.
- 17.5.33. Further information regarding water vole protection will be provided within the outline CEMP.
- Amphibians*
- 17.5.34. GCN eDNA surveys were carried out in June 2023, and results returned for all surveyed ponds were negative for GCN DNA.
- 17.5.35. Further information is provided within **Technical Appendix 7.7.**
- 17.5.36. If found to be present, The Scheme will be subject to a EPSML or alternative licensing method such as District Level Licensing (DLL) which will ensures that the favourable conservation status of the local populations of the species will be maintained. Otherwise, Reasonable Avoidance Measures (RAMs) for amphibians will be sufficient to minimise any potential impacts on individual amphibians. The RAMs will include a 'tool box talk' and watching brief by a suitably qualified ECoW to minimise risk of accidental harm, further information will be provided within the outline CEMP as part of the next iteration of the PEIR.

- 17.5.37. The Scheme layout has been designed to avoid impact to hedgerows, ponds, and ditches within and surrounding the Draft Order Limits. These habitats provide suitable terrestrial and aquatic habitats for amphibians and will be retained and protected. The habitat retention and proposed enhancements (hedgerow planting, species diverse grassland creation, hibernacula, insect hotels and beetle banks) will provide a clear habitat gain for amphibian species by providing enhanced terrestrial habitat for foraging, dispersal and hibernation purposes, thereby potentially removing amphibians' likely reliance on the retained field boundary features.

Reptiles

- 17.5.38. The arable fields located within the Draft Order Limits offer negligible opportunities for reptile species. However, field boundary features such as: hedgerows and ditches offer potentially suitable habitats, which will be retained and protected as part of The Scheme. Species diverse grassland will also be established within the Draft Order Limits (as detailed within the outline LEMP submitted as part of the next iteration of the PEIR) and creation of hibernacula will provide increased habitat opportunities for reptile populations in and surrounding the Draft Order Limits.
- 17.5.39. A series of RAMs will be implemented to avoid significant impacts on reptile populations. The RAMs will include a 'tool box talk' and watching brief by an appropriately qualified ecologist to minimise risk of accidental harm, further details will be provided within the Outline CEMP submitted with the next iteration of the PEIR.

Invertebrates

- 17.5.40. The arable fields and agricultural management regime in place along with the application of chemicals including pesticides within the Draft Order Limits currently provides low value for invertebrate species. Field boundaries including hedgerows, watercourses and ditches provide higher value and may support a more diverse invertebrate assemblage. These habitats will be retained and protected with buffers, and measures to control runoff during construction and other management controls will be detailed within the CEMP. Enhancements for invertebrates will be delivered as part of The Scheme through habitat creation, landscape planting and ongoing management, with extensive and relatively undisturbed species diverse grassland, hedgerow planting, insect hotels and beetle banks providing increased opportunities for invertebrate numbers and species diversity within the Draft Order Limits.

RAMs will be implemented to protect important retained habitat features such as hedgerows, trees, woodland, ponds, watercourses and ditches. These will also be designed to maintain awareness of and safeguard invertebrates associated with such features. The RAMs will include a 'tool box talk' and watching brief by an appropriately qualified ecologist to minimise risk of accidental harm, further details will be provided within the Outline CEMP submitted with the next iteration of the PEIR.

Other Priority Mammals

- 17.5.41. The commitment to provide measurable BNG includes embedded elements which avoid or reduce the potential for adverse ecological impacts amongst a range of associated species, including brown hare, hedgehog, polecat and harvest mouse. These measures include retaining identified higher value habitat features which would be used by such species when present, such as hedgerows, ditches, and woodlands, and the provision of extensive habitat enhancements which will provide opportunities for shelter, foraging, dispersal and breeding

across the Draft Order Limits (as detailed within the outline LEMP submitted with the next iteration of the PEIR).

17.5.42. As the solar panels are raised off the ground, and the perimeter security fence will retain suitable gaps/mammal gates at the base to allow free movement of priority mammal species, no habitat loss or severance effects will result. Roe deer have also been found to use mammal gates, and have on occasion been found passing through solar sites⁴³.

17.5.43. A series of RAMs will be implemented to avoid significant impacts on mammal populations. The RAMs will include a 'tool box talk' and watching brief by an appropriately qualified ecologist to minimise risk of accidental harm, further details will be provided within the Outline CEMP submitted with the next iteration of the PEIR.

Invasive Species

17.5.44. Water fen was identified within the Draft Order Limits and Pontic rhododendron was recorded in an adjacent woodland parcel.

17.5.45. These species are listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended). It is an offence to plant or otherwise cause such species to grow in the wild. This includes allowing the species to grow/spread and spreading the species or transferring polluted ground material from one area to another.

17.5.46. Prior to the commencement of the construction programme an invasive species walkover survey will be undertaken during an appropriate time of year (May – October) in order to assess the distribution of invasive species within the Draft Order Limits, in particular within or near construction working areas.

17.5.47. If required, an appropriate invasive species management and treatment programme will be implemented by a licensed and experienced invasive species contractor. A detailed method statement will be produced to inform these actions and prevent further spread within the Draft Order Limits during the construction phases, detailing the commitment to control or undertake long-term eradication of the species from within the Draft Order Limits. Further information will be provided within the outline LEMP provided with the next iteration of the PEIR.

17.5.48. The appointed ECoW will include information regarding invasive non-native species within the toolbox talk, including providing informing contractors on avoidance / good practice measures required to avoid facilitating the spread of these species. Should further areas of spread / other invasive species be encountered within the Draft Order Limits prior to or during construction, the advice of the appointed ECoW will be sought, and appropriate measures taken in order to achieve legislative compliance.

Operation

Ecological Monitoring/Habitats

⁴³ Lightrock Power (unknown) *Frequently Asked Questions* <https://www.upperleighsolarfarm.com/faqs> accessed 10/07/23

- 17.5.49. Extensive habitat enhancement provision is embedded within The Scheme and provided as part of the construction phase which include the creation of new habitats of high ecological value and BNG. During the operational period created and existing semi-natural habitats within the Draft Order Limits will be subject to long-term management by suitably qualified/experienced professionals. The management of these semi-natural habitats will be informed by a detailed LEMP.
- 17.5.50. Commitment to deliver quantifiable BNG will include the requirement for long-term ecological monitoring through the lifespan of The Scheme by a suitably qualified ecologist. These ecological monitoring surveys will assess the success of mitigation and enhancement measures detailed within the LEMP. If necessary, recommendations will be given for remedial actions required to achieve the biodiversity objectives detailed within the LEMP and/or adhere to relevant wildlife conservation legislation at that time.
- 17.5.51. Additional post-construction species specific monitoring may be required as stipulated as a legal requirement within a EPSML (or other species-specific mitigation licence); see Construction above. Any such monitoring will be in addition to the ecological monitoring discussed above, to ensure compliance with the licence conditions.
- 17.5.52. Operational phase ecological monitoring schedules and objectives will be detailed within the outline LEMP submitted with the next iteration of the PEIR. Further mitigation to benefit species are described below.
- Birds – All species*
- 17.5.53. The establishment of newly created/enhanced habitats including the area to the north of Stainforth & Keadby Canal and habitats such as grassland and hedgerow will allow for the consistent long-term improvement in the quality and quantity of available foraging and potentially nesting habitats (for non-ground nesting species) when compared with current baseline opportunities.
- Bats*
- 17.5.54. Habitat creation and enhancement will also allow for the consistent long-term improvement in the quality and quantity of available foraging/commuting bat habitats and the protection of potential tree roosts within the Draft Order Limits. This will provide extended opportunities for foraging/commuting bats compared to baseline opportunities which are largely concentrated within linear field margin habitats.
- 17.5.55. The Scheme will not be subject to permanent nightly illumination. Lighting during operation will be limited to temporary lighting required for access and maintenance in the unlikely event that such actions are required after dark. Such temporary lighting design will adopt 'ecologically sensitive' lighting in-line with current guidance⁴⁴. All temporary lighting will avoid the illumination of existing field margin habitats, woodland, and created semi-natural habitats associated with the construction phase, thereby allowing the continued usage of the Draft Order Limits by bats.

⁴⁴ Institution of Lighting Professionals / Bat Conservation Trust. (2023). *Guidance Note 08/23 Bats and artificial lighting at night*. <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/> (accessed 31/08/2023)

Badgers & other priority mammal species

- 17.5.56. Habitat creation and enhancement establishment could also benefit badger species through increased provision of undisturbed habitat and prey resource when compared with current baseline opportunities.

Amphibians and Reptiles

- 17.5.57. Habitat piles will be created (using cut vegetation arising from habitat management practices during the operational phase) within the Draft Order Limits, potentially providing suitable refuges for amphibian and reptile species. Further information will be provided within the outline LEMP provided with the next iteration of the PEIR.

Invasive Species

- 17.5.58. Ecological monitoring (see above) will assess the success of the invasive non-native species eradication measures discussed in the construction mitigation measures. If further infestations are recorded, an appropriate invasive species treatment program will be implemented by a licensed and experienced invasive species contractor.

Decommissioning

- 17.5.59. Baseline conditions within the Draft Order Limits are likely to change significantly over the 40 years of operation, and prediction of these conditions at this point is considered unreliable in terms of predicting likely future decommissioning effects on biodiversity. However potential impacts from decommissioning are considered to be similar to those already described in relation to the construction phase, namely direct and indirect disturbance, temporary/permanent habitat loss and vegetation removal.
- 17.5.60. Updated ecological surveys will be undertaken prior to decommissioning in order to record the presence of protected and notable species and habitats and identify potential effects and any necessary protection and mitigation measures in order to comply with planning policy and wildlife legislation applicable at the time.

Additional Mitigation

- 17.5.61. Additional Mitigation has been identified in relation to those effects which have been assessed as Significant adverse. Specifically, these are restricted to construction effects on qualifying bird interests associated with designated sites (non-breeding bird species) and ground nesting bird species including skylark.

Statutory Designated Sites

- 17.5.62. Work is ongoing relating to assessing likely significant effects (including Information to Inform a HRA for some sites) and subsequent mitigating effects on the following statutory designated sites; Thorne, Crowle & Goole Moors SSSI, Thorne and Hatfield Moors SAC and SPA as well as Humber Estuary Ramsar and SPA. This will be included within the next iteration of the PEIR.

Ground-nesting birds

17.5.63. Opportunities for ground nesting birds will be impacted due to The Scheme, including skylark, as the presence of solar panels reduces the area of open ground suitable which is preferred by these species for nesting. Significant adverse effects have been identified through the impact assessment process and as a result, specific mitigation measures have been identified as necessary for ground nesting species.

17.5.64. A mitigation strategy will be adopted that will incorporate a series of measures, both within the Draft Order Limits and wider area to maintain the favourable status of ground nesting species and will be set out in the next iteration of the PEIR and also included within consultation. Measures that may be included within the strategy include the provision of ‘skylark plots’ for nesting (areas of open ground away from encroaching trees and hedgerows maintained across the Scheme which will not have solar panels), possible changes in crop management of farmland in the wider area, increase in foraging resources through the planting of species diverse grassland and creation of beetle banks all to encourage invertebrate prey. Consideration of how the mitigation strategy will be secured will be addressed within the next iteration of the PEIR.

17.5.65. Table 7.8 below provides a summary of proposed mitigation measures.

Table 7.8: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Requirements
1	Avoidance and protection of higher value habitats within and around the Draft Order Limits, which will be set out within the LEMP.	X		
2	New habitat creation/enhancement, which will be set out within the LEMP and as part of BNG.	X		
3	Pre-construction surveys for protected and invasive species and to inform additional avoidance or mitigation requirements during the construction phase.			X
4	Biodiversity protection measures (construction phase) to be included within the LEMP			X
5	Ground nesting bird mitigation strategy, which will be included within the LEMP. Off-site measures, where required, will be considered in the next iteration of the PEIR.		X	X
6	Where breeding birds (including Schedule 1 species) are found to be present, bird exclusion zones will be			X

	implemented. Specific measures will be set out within the CEMP.			
7	Badger / Otter / Water vole / GCN mitigation measures, including an mitigation strategy with RAMS and/or licensing, as appropriate.			X
8	Reptile and other priority mammals RAMS as set out within the LEMP.			X
9	Invasive species treatment plan, as set out within the CEMP.			X

Enhancements

- 17.5.66. Consultation is ongoing with Doncaster Council regarding biosphere reserve aspirations, details, and results of this (including habitat enhancements, if possible) will be included within the next iteration of the PEIR.
- 17.5.67. An area to the north of Stainforth & Keadby Canal will be enhanced for bird species, including a range of breeding and wintering birds. Further details relating to this will be included within the next iteration of the PEIR.
- 17.5.68. Proposed species habitat enhancements within the Draft Order Limits include;
 - Additional bird nesting provision, with the inclusion of bird boxes, including barn owl and tawny owl boxes;
 - Additional bat roosting provision, with the inclusion of bat boxes;
 - Inclusion of hedgehog boxes;
 - Inclusion of insect hotels;
 - Inclusion of beetle banks;
 - Inclusion of hibernacula; and,
 - Inclusion of bee hives.

Residual Effects

- 17.5.69. With the above measures in place, there will be no significant adverse residual effects on any ecological features assessed as Not Significant as a result of The Scheme with significant positive effects arising from the embedded habitat enhancements associated with BNG delivery.
- 17.5.70. Receptors that were assessed as having a likely significant effect are discussed below.

Construction

Statutory Designated Sites

- 17.5.71. Further detailed assessment on the effects of The Scheme on statutory designated sites is proposed and will be included within an Information to Inform an HRA, as part of the next iteration of the PEIR.

Breeding birds – ground nesting species

- 17.5.72. A mitigation strategy for ground nesting species will be implemented for The Scheme which will ensure the favourable conservation status of these species. In addition, habitat enhancements will provide an increased foraging resource. Protection measures will also be implemented in line with guidance provided within the CEMP.
- 17.5.73. Subsequently, overall impacts to ground nesting species will be of minor adverse magnitude on a receptor of National–Regional/County value and sensitivity, which is consequently **Significant**.

Operation

Statutory Designated Sites

- 17.5.74. There will be no operational negative effects on designated sites over and above those described in the Construction effects section above. It is considered that with the management of habitats buffers and good practice measures (as will be detailed within the CEMP and LEMP), there will be improved habitat connectivity with these sites as well as habitats within the wider environment. This will create a larger, stronger, and more ecologically resilient natural corridors in the landscape compared to the current baseline, which comprises intensively managed farmland bordering the designated sites.
- 17.5.75. Subsequently, impacts to statutory and non–statutory designated sites will be of medium (positive) magnitude on a receptor of International/European – Local value and sensitivity, which are consequently a **Significant beneficial effect**.

Breeding birds – ground nesting species

- 17.5.76. There will be no operational negative effects on breeding birds (ground nesting species) over and above those described in the Construction effects section above. It is considered that creation and enhancements of habitats as part of The Scheme will be favourable to foraging ground nesting species.
- 17.5.77. Subsequently, overall impacts to ground nesting species will be of minor adverse magnitude on a receptor of National–Regional/County value and sensitivity, which is consequently **Significant**.

17.6. Cumulative and In-Combination Effects

- 17.6.1. Information relating to cumulative and in-combination effects will be included within the next iteration of the PEIR.

17.7. Summary

Introduction

- 17.7.1. This chapter of the PEIR, along with the accompanying Technical Appendices, addresses the potential effects on biodiversity during construction, operation and decommissioning of The Scheme. Effects have been assessed in accordance with guidance set out in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1 (2018, Chartered Institute of Ecology and Environmental Management)⁴⁵

Baseline Conditions

- 17.7.2. The Scheme comprises an area of predominantly agricultural land between the towns of Thorne and Crowle. The Tween Bridge Wind Farm is located within the Draft Order Limit, and consists of twenty-two operational wind turbines. The Stainforth and Kneadby Canal crosses the Draft Order Limit from west to east. The River Torne is present adjacent to the south west of the Draft Order Limits.
- 17.7.3. Habitats within the Draft Order Limits are dominated by arable farmland, associated with species-poor hedgerow systems and watercourses with ponds and a parcel of plantation broad-leaved woodland. The Draft Order Limits comprise of open fields of limited biodiversity value, and subject to intensive farmland management.
- 17.7.4. The Draft Order Limit lies outside designated sites with the exception of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI. Whilst the Moors SPA/SAC/SSSI lies within the Draft Order Limit, they are outside the development footprint.
- 17.7.5. Comprehensive ecological surveys have undertaken since 2022 and are continuing to be undertaken to inform this assessment. With the aim of providing the required information regarding habitats along with protected species, such as breeding and non-breeding birds, badger, otter, water voles, amphibians and invertebrates. These surveys were used (and continue to be used, as results are returned) to inform the iterative design of The Scheme and avoidance of ecological features of value, such as hedgerows, woodland and watercourses, has been a core design principle.

Likely Significant Effects

- 17.7.6. Potential construction phase ecological effects associated with The Scheme are considered to be temporary and short term. Higher value habitats including woodlands, watercourses, trees and hedgerows are retained and protected, with construction phase effects largely confined to arable land of low ecological value.
- 17.7.7. The Scheme also includes embedded habitat enhancement provisions; which will be managed for the benefit of wildlife over the long term and will provide biodiversity gains for a wide variety of species. Additionally, the proposed creation of diverse grasslands and hedgerow planting will deliver a quantifiable BNG. The commitment to a BNG above mandatory or policy requirements,

⁴⁵ CIEEM. (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (version 1.2). <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf> (accessed 28/06/2023)

and adopted as a fundamental design principle ensures that The Scheme will deliver a substantial ecological benefit.

- 17.7.8. Effects from the construction phase have been assessed as not significant in relation to non-statutory designated sites, habitats and species with the exception of statutory designated sites, ground nesting species and non-breeding birds.
- 17.7.9. Further detailed assessment on the effects of The Scheme on statutory designated sites is proposed and will be included within an Information to Inform and HRA, as well as the final ES Chapter.
- 17.7.10. A significant population of ground nesting species was recorded within the Draft Order Limits. A ground nesting mitigation strategy is proposed that will utilise both on and off-site mitigation measures. This detailed strategy will be included within the next iteration of the PEIR and also included within the consultation process and ensure the favourable conservation status of these species. However, it is considered that not all 250 skylark territories can be mitigated for, and as a result there is likely to be a **Significant** effect.
- 17.7.11. Once operational, solar farms function with little intervention or disturbance required. This is limited to occasional maintenance visits and ongoing management of grassland and other habitats around the Draft Order Limits, including cutting or grazing the grassland and periodic hedgerow cutting. Habitat creation, which forms part of the operational design, includes extensive areas of grassland attractive to a range of species which maintains habitat connectivity within and around the Draft Order Limits and provides enhanced opportunities for wildlife.

Mitigation

- 17.7.12. The included BNG for habitats, combined with other measures, will provide new and enhanced features that can be used for breeding, foraging, overwintering and refuge by a range of species, from birds and bats to amphibians, reptiles and invertebrates. The cessation of the use of agricultural chemicals across the Draft Order Limits (following removal from farming use) will provide further benefit, in particular for invertebrate populations.
- 17.7.13. The habitat enhancements across the Draft Order Limits will provide benefits by increasing opportunities for many of the species associated with designated sites and increase and improve ecological connectivity.
- 17.7.14. Measures are set out to avoid or mitigate against potentially adverse effects during both the construction, operation and decommissioning periods of The Scheme and these measures will be detailed within the CEMP, LEMP and DEMP.
- 17.7.15. Additional measures have been identified where required to ensure legislative compliance and the protection of wildlife, including pre-commencement/construction surveys and, where necessary, mitigation licences issued by Natural England which will ensure that the favourable conservation status of relevant species will be maintained.

Enhancement

- 17.7.16. Further species enhancements are proposed including an area to the north of Stainforth & Keadby Canal which will be enhanced for a range of breeding and non-breeding bird species,

with specific bird focused habitats created such as 'scrapes' (shallow wetlands). In addition, a number of boxes will be installed for birds, bats and hedgehogs as well as insect hotels, beetle banks, hibernacula and bee hives across the Draft Order Limits.

17.7.17. Where possible, habitat enhancements in line with biosphere aspirations will be set out within the next iteration of the PEIR.

Conclusion

17.7.18. With embedded design measures and mitigation in place as described, The Scheme will not result in any significant adverse effects on any habitats or species, or non-statutory designated sites, with the exception of statutory designated sites, ground nesting birds and non-breeding birds. Further detailed assessment will be carried out and included within the next iteration of the PEIR and final ES Chapter, which will aim to mitigate and/or compensate for these effects and where possible, reduce the effect, so it is no longer significant.

17.7.19. Major beneficial effects are anticipated as a result of habitat creation and diversification accompanied by long-term habitat management for the benefit of biodiversity.

17.7.20. **Table 7.9** contains a summary of the preliminary assessment of the likely significant effects of The Scheme.

Table 7.9: Summary of Effects, Mitigation and Residual Effects

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
Construction (*subject to further detailed assessment, which will be included within the next iteration of the PEIR which will include an Information to Inform and HRA)								
Statutory Designated Sites excluding qualifying bird species*	Habitat loss/damage. Disturbance to habitats & associated species	Indirect, temporary & permanent	High	Minor	International-Regional/County	Not Significant	CEMP including pollution prevention and control measures Protection buffers	Not Significant
Statutory Designated Sites – qualifying bird species*	Loss of overwintering habitat Loss of foraging habitat (nightjar)	Indirect, temporary & permanent	High	Minor based on Year 1 survey data	International-Regional/County	TBC		To be revised on completion of Year 2 surveys.

Ecology and Nature Conservation

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
	Disturbance of nightjar							
Non-statutory designated sites	Habitat loss/damage. Disturbance to habitats & species	Both direct and indirect, temporary	Medium	Negligible	Regional-Local	Not significant	Buffers around watercourses and woodland Pollution prevention and control measures Tree root protection zones	Not Significant
Habitats	Habitat loss/damage Disturbance	Direct, permanent and temporary	Medium-Low	High	Local	Significant beneficial effect	Embedded mitigation and enhancement as part of BNG delivery Buffer zones around	Significant beneficial effect

TWEEN BRIDGE SOLAR FARM

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Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
							hedgerows, watercourses and ponds. Pollution prevention and control measures	
Breeding Birds (excluding Schedule 1 and ground nesting species)	Disturbance	Direct and indirect, temporary	Low	Low	Site/Local	Not Significant	Buffers around woodland and hedgerows Pre-commencement survey if construction during the breeding bird season Mitigation measures implemented such as bird protection	Not Significant

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Ecology and Nature Conservation

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
							zones, if required	
Breeding Birds (Schedule 1 species)	Disturbance	Direct and indirect. temporary	Medium	Moderate	Regional/County	Significant	<p>Buffers around woodland and hedgerows</p> <p>Pre-commencement survey if construction during the breeding bird season</p> <p>Mitigation measures implemented such as bird protection zones, if required</p>	Not Significant

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
Breeding Birds (Ground nesting species)	Habitat loss & disturbance	Direct & indirect. Permanent & temporary	High-Medium	Major	National-Regional/county	Significant	A detailed mitigation strategy including measures both within the Draft Order Limits and wider area. Pre-commencement survey if construction during the breeding bird season	Significant
Non-breeding birds	Habitat loss & disturbance	Direct & indirect. Permanent & temporary	Medium	Minor	County	Not Significant		Not Significant
Operation								

Ecology and Nature Conservation

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
Statutory & non-statutory designated sites	Habitat creation & enhancement	Direct. Permanent	High-Low	Medium positive	International/European - Local	Significant beneficial effect	Establishment of habitats will create stronger and more ecologically resilient corridors	Significant beneficial effect
Habitats	Habitat creation & enhancement	Direct. Permanent	Low	High positive	Local	Significant beneficial effect	Establishment of habitats will create stronger and more ecologically resilient corridors	Significant beneficial effect
Breeding birds (excluding Schedule 1 and ground nesting species)	Minor disturbance for routine maintenance. Species habitat	Direct & indirect. Permanent & temporary	Medium	Low positive	Site/Local	Not significant	Draft Order Limits will be subject to reduced disturbance compared to normal farming practices.	Not significant

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
	creation & enhancement						Habitat creation and installation of bird boxes will benefit the species.	
Breeding birds (Schedule 1 species)	Minor disturbance for routine maintenance. Species habitat creation & enhancement	Direct & indirect. Permanent & temporary	Medium	Low positive	Regional/county	Not significant	Draft Order Limits will be subject to reduced disturbance compared to normal farming practices. Habitat creation will benefit the species.	Not significant

Ecology and Nature Conservation

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value**	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation Enhancement Measures	Residual Effects
Breeding Birds (Ground nesting species)*	No additional effects than construction	Direct & indirect. Permanent & temporary	High	Moderate	National	Significant		Significant
Cumulative and In-Combination – To be included within the next iteration of the PEIR								

