FENWICK SOLAR FARM

Preliminary Environmental Information Report

Volume I Chapter 8: Ecology

March 2024

BOOM-POWER.CO.UK

BOOM POWER

Prepared for:
Fenwick Solar Project Limited

Prepared by:
AECOM Limited

Table of Contents

Tables

8. Ecology

8.1 Introduction

8.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents a preliminary assessment of the likely significant effects of the Fenwick Solar Farm (hereafter referred to as the 'Scheme') with respect to ecology. The preliminary assessment follows the methodology outlined in the Scoping Report (**PEIR Volume III Appendix 1-1: EIA Scoping Report**) and is based on information obtained to date and the indicative Scheme design (**PEIR Volume II Figure 2-3: Indicative Site Layout** and **PEIR Volume I Chapter 2: The Scheme**.

8.1.2 This chapter:

a. Identifies and proposes measures to address the potential impacts and likely significant effects of the Scheme on biodiversity, during the construction, operation and maintenance, and decommissioning phases;

b. Provides a preliminary evaluation of relevant important ecological features (including nature conservation designations, priority habitats, protected species and invasive non-native species (INNS)) associated with the Scheme, with each being assigned a nature conservation value (sensitivity value);

c. Identifies the Scheme's potential direct and indirect impacts and effects on important ecological features and their conservation status, inter-relationships, and their contribution to local (and if appropriate county, regional and national) biodiversity; and

d. Takes into account impact avoidance design measures and management activities, identifies and describes the significance of potential effects.

8.1.3 Effects on biodiversity from infrastructure projects can arise from direct and indirect impacts upon designated sites, habitats and, or species, and be of a temporary or permanent nature. Indirect effects can occur through pollution of air and water and via changes in lighting, noise or hydrology. This chapter is therefore supported by information contained within the following chapters within **PEIR Volume I**:

a. **Chapter 6: Climate Change**;

b. **Chapter 9: Water Environment** (which includes hydrology and water pollution);

c. **Chapter 10: Landscape and Visual Amenity** (which includes lighting);

d. **Chapter 11: Noise and Vibration**; and

e. **Chapter 14: Other Environmental Topics** (including air quality).

8.1.4 This chapter should also be read in conjunction with **PEIR Volume I Chapter 1** to **5**, which include a description of the Scheme (**PEIR Volume I Chapter 2: The Scheme**), Alternatives and Design Evolution (**PEIR Volume I Chapter 3: Alternatives and Design Evolution**) and the Environmental

Impact Assessment Methodology (**PEIR Volume I Chapter 5: Environmental Impact Assessment Methodology**).

8.1.5 This chapter is supported by the following technical appendices (**PEIR Volume III**) which provide details of specific legislation, policy, guidance, methods used to characterise each feature's baseline and the results of the desk and field-based assessment available at the time of writing the PEIR:

a. **Appendix 8-1: Legislation, Policy and Guidance (Ecology)**;

b. **Appendix 8-2: Preliminary Ecological Appraisal**;

c. **Appendix 8-3: Reptile Survey Report**;

d. **Appendix 8-4: Bat Survey Report**; and

e. **Appendix 8-5: Badger Report (Confidential)**.

8.1.6 The baseline report for Badger *Meles meles* is not included within this PEIR, owing to the sensitivities of detailing information on the location of Badger setts and risk of illegal persecution. Therefore, **PEIR Volume III Appendix 8-5: Badger Report (Confidential)** of this PEIR will be provided confidentially to key stakeholders, including the Planning Inspectorate.

8.1.7 This chapter is also supported by the following figures (**PEIR Volume II**) which present locations of relevant sites statutorily and non-statutorily designated for nature conservation (**PEIR Volume II Figure 8-1: Sites Statutorily Designated for their Biodiversity Value at an International and National Level** and **PEIR Volume II Figure 8-2: Sites Non-Statutorily Designated for their Biodiversity Value**) and broad habitats (including priority habitats) recorded during the Phase 1 habitat survey undertaken to date (**PEIR Volume II Figure 8-3: Phase 1 Habitats**).

8.1.8 As part of the ES that will be submitted with the DCO application, a Framework Construction Environmental Management Plan (CEMP)), Framework Operational Environmental Management Plan (OEMP) and a Framework Decommissioning Environmental Management Plan (DEMP) will be prepared, to describe management of environmental effects of the Scheme and to demonstrate compliance with environmental legislation.

8.1.9 A Framework Landscape and Ecology Management Plan (Framework LEMP) will also be prepared and submitted as part of the DCO application, the purpose of which will be to set out the key measures required to avoid, mitigate and compensate for effects to biodiversity and landscape from the construction and operation and maintenance of the Scheme. The Framework LEMP will provide management prescriptions aimed at ensuring the Scheme delivers a net gain for biodiversity over the long term and will include targeted landscape and biodiversity mitigation that will be incorporated into the Scheme design. This will be an ongoing iterative process, with environmental specialists actively involved in its development, using the mitigation hierarchy to avoid impacts, incorporating mitigation for those that cannot be avoided and incorporating opportunities for enhancement at the earliest possible stage.

8.1.10 This assessment reports on the ecology baseline and Scheme design information available at the time of writing. An updated assessment of the potential impacts and likelihood of significant effects of the Scheme on

ecological features including any updates to the baseline will be undertaken as part of the Environmental Impact Assessment (EIA) and will be reported in the ES that will be submitted with the DCO Application.

8.2 Legislation, Policy and Guidance

8.2.1 A summary of applicable legislation, planning policy and other guidance documents relating to biodiversity and relevant to the Scheme is provided below.

8.2.2 Full details of the legislation, policy, and guidance of relevance to the assessment of significant effects of the Scheme to important ecological features is provided in full in **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**.

Legislation

8.2.3 The following legislation is applicable in order to inform the biodiversity assessment:

a. The Wildlife and Countryside Act 1981 (as amended) (WCA) (Ref. 8-1);
b. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats and Species Directive) (Ref. 8-2);
c. Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Birds Directive) (Ref. 8-3);
d. Regulation (EU) 1143/2014 (2014) on the prevention and management of the introduction and spread of invasive alien species (the IAS Regulation) (Ref. 8-4);
e. The Ramsar Convention 1971 (Ref. 8-5);
f. The Environment Act 2021 (Ref. 8-6);
g. The Conservation of Habitats and Species Regulations 2017 (as amended) (Ref. 8-7);
h. The Countryside and Rights of Way Act 2000 (Ref. 8-8);
i. The Natural Environment and Rural Communities Act 2006 (NERC) (Ref. 8-9);
j. The Protection of Badgers Act 1992 (Ref. 8-10);
k. The Hedgerows Regulations 1997 (Ref. 8-11);
l. The Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (Ref. 8-12);
m. Animal Welfare Act 2006 (Ref. 8-13);
n. Salmon and Freshwater Fisheries Act 1975 (Ref. 8-14);
o. Eels (England and Wales) Regulations 2009 (Ref. 8-15); and
p. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 8-16).

8.2.4 As part of the assessment of the Scheme, it is necessary to determine whether the Scheme is likely to have a significant effect on areas that have been internationally designated for nature conservation purposes such as Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites, as well as proposed or potential sites (hereafter, European sites). Therefore, Likely Significant Effects (LSE), with relation to European sites, will be considered further in the Habitats Regulations Assessment (HRA) report that will be included with the ES as part of the DCO application.

National Planning Policy

8.2.5 This chapter considers relevant National Policy Statements (NPS) for energy, including relevant sections for solar and biodiversity. These NPS's set out national policy for energy infrastructure and provide guidance and the legal framework for planning decisions. They comprise the government's objectives for the development of nationally significant infrastructure and take account of government policy relating to the mitigation of, and adaptation to, climate change. Therefore, the following NPS's, which were released in November 2023 and which came into force on 17 January 2024, have been reviewed and are relevant to the Scheme and biodiversity:

a. Overarching National Policy Statement for Energy (EN-1) (November 2023) (Ref. 8-17);

b. NPS for Renewable Energy Infrastructure (EN-3) (November 2023) (Ref. 8-18); and

c. NPS for Electricity Networks Infrastructure (EN-5) (November 2023) (Ref. 8-19).

8.2.6 The National Planning Policy Framework (NPPF) (December 2023) (Ref. 8-20) sets out the Government's planning policies for England and how these are expected to be applied. While the NPPF does contain specific policies for Nationally Significant Infrastructure Projects (NSIPs) like those in the above NPS's, it remains a relevant matter for consideration as to the Government's general directions in respect of planning. The NPPF with particular reference to Section 15 (conserving and enhancing the natural environment) states that the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity.

8.2.7 The NPPF (Ref. 8-20) is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

8.2.8 The NPPF (Ref. 8-20) also specifies the obligations that the Local Authorities and the UK Government have regarding sites statutorily designated for their biodiversity value and otherwise protected or notable habitats and protected species under UK and international legislation and how this is to be delivered in the planning system.

8.2.9 Protected or notable habitats and species are of material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted and significant harm to biodiversity cannot be avoided, then adequate mitigation

measures (or as a last resort, compensation) will be required to avoid or minimise impacts on certain habitats and species.

Local Planning Policy

8.2.10 Applicable local planning policies that are relevant to inform the biodiversity assessment for the Scheme are:

a. Doncaster Local Plan 2015-2035 (adopted September 2021) (Ref. 8-21); and

b. The Doncaster Green Infrastructure Strategy 2014-2028 (adoption version April 2014) (Ref. 8-22).

8.2.11 Policies in Chapter 10 (Green Infrastructure) of The Doncaster Local Plan (Ref. 8-21) seek to maintain, protect, enhance and extend all assets in the green infrastructure network in Doncaster. Development proposals will be supported which contribute to an attractive and connected environment including creating and enhancing green corridors that link urban areas to countryside. The policies provide the detail on how Doncaster's green infrastructure visions and objectives will be achieved through the planning system by providing a network of well-connected habitats and an attractive, healthier, safer and more active place to live and work.

8.2.12 The Doncaster Green Infrastructure Strategy (Ref. 8-22) sets out an overall approach for delivering an integrated network of high-quality green spaces, habitats and landscapes across the borough.

Other Guidance Documents

8.2.13 Other guidance documents that have informed the assessment of the impacts of the Scheme on biodiversity includes:

a. Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Costal and Marine (Ref. 8-23); and

b. The Environmental Improvement Plan 2023 (Ref. 8-24);

c. Natural England and Department for Environment, Food and Rural Affairs (Defra) Standing Advice (protected species) (Ref. 8-25);

d. The United Kingdom (UK) Biodiversity Action Plan (BAP) list of priority habitats and species (Ref. 8-26), succeeded by the UK Post-2010 Biodiversity Framework (Ref. 8-27);

e. Doncaster Biodiversity Action Plan (Doncaster BAP) (Ref. 8-28);

f. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Ref. 8-29);

g. Mitigating biodiversity impacts associated with solar and wind energy development: Guidelines for project developers (Ref. 8-30);

h. Natural England's evidence review of the impacts of solar farms on birds, bats and general ecology (Ref. 8-31);

i. Natural England Technical Information Note TIN101 Solar parks: Maximising Environmental Benefits (Ref. 8-32).

8.3 Scoping Opinion and Additional Consultation

Scoping Opinion

8.3.1 A scoping exercise was undertaken in spring 2023 to establish the content of the assessment and the approach and methods to be followed. The scoping exercise outcomes were presented in the Scoping Report (**PEIR Volume III Appendix 1-1: EIA Scoping Report**) which was submitted to the Planning Inspectorate on 1 June 2023. The Scoping Report records the findings of the scoping exercise and details the technical guidance, standards, good practice, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on ecology.

8.3.2 A Scoping Opinion was received from the Planning Inspectorate on 11 July 2023 (**PEIR Volume III Appendix 1-2: EIA Scoping Opinion**).

8.3.3 A full review of all comments raised in the Scoping Opinion is provided in **PEIR Volume III Appendix 1-3: EIA Scoping Opinion Responses**. This also outlines how and where the Scoping Opinion comments have been addressed within this PEIR or will be addressed within the ES.

Additional Consultation

8.3.4 In addition to the statutory consultation process, additional consultation was undertaken to steer the development of the Scheme and ensure matters raised were addressed by the Applicant, details of which are presented in Table 8-1, below.

8.3.5 There is ongoing engagement with consultees and this section will be updated based on further consultation on the Scheme and matters raised by stakeholders, within the ES, submitted as part of the DCO application.

Table 8-1: Additional Consultation Responses Related to Ecology

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
Royal Society for the Protection of Birds (RSPB)	Following comments raised by NE in their scoping response, the RSPB were contacted to introduce the Scheme and invite comment on the proposals and on the methodology and rationale for the scope of bird surveys being undertaken to inform the assessment. The RSPB was unable to provide a detailed response owing to the large volume of applications they are asked to comment on.	Information on survey methods for birds is included in Table 8-2. Further consultation with NE has been undertaken via the Discretionary Advice Service (see below) to address specific comments raised on survey methods for birds.
City of Doncaster	The need for hedgerow surveys – City of Doncaster Council has a new Trees and Hedgerows officer who will be informed of	The Applicant will continue to engage with the relevant parties within City of Doncaster Council, including

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
Council Ecologist	the Scheme proposals. The Council also has a comprehensive hedgerows database that may be of use.	the Trees and Hedgerows Officer, to ensure that baseline data using in support of the impact assessment, is complete. Hedgerow surveys and a tree survey will be completed in 2024 in accordance with BS:5837 (Ref. 8-74) and will be undertaken within the Site Boundary, as relevant. A preliminary assessment on the potential impacts on hedgerows and trees is included within this chapter, with embedded design mitigation and appropriate buffers included in Section 8.10. Following detailed surveys to be undertaken in 2024 and where required, further scheme design evolution, a final assessment will be presented in the ES.
	Cumulative impacts of this and other solar developments and how ecological networks will be maintained – considers this to be an important issue as there are two other large solar and battery arrays within 5 kilometres (km). Scheme design should follow the mitigation hierarchy and consideration should be given to the Nature Recovery Networks in Doncaster (contacts can be provided in relation to these).	A preliminary assessment of cumulative effects is presented in Section 8.15 of this PEIR and will be updated in the ES.
	Priority habitats (specifically Coastal Floodplain Grazing Marsh) - The protection, enhancement and development of priority habitats feature in the City of Doncaster Council's policies. Further discussions on opportunities and safeguards	The Phase 1 Habitat Survey is ongoing, with habitats identified to date presented in Table 8-8 of this chapter. This identifies habitats present within the Site Boundary and will be further informed by habitat surveys undertaken in 2024, where applicable.

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
	that could be a part of the Scheme would be welcomed.	A preliminary assessment of effects is presented in Section 8.11 of this chapter.
	Opportunities for enhancements (BNG) - Doncaster Local Planning Authority have been at the forefront of BNG implementation and have a supplementary planning document which provides guidance on how BNG is applied 'on the ground'. The Council would like to see carbon budgets attached to the different land management regimes pre and post development in order that overall sustainability can be considered, not just ecology.	This comment is noted and the Applicant will continue to engage with the City of Doncaster Council ton matters relating to BNG. Biodiversity Net Gain Assessment will be included in the ES, submitted as part of the DCO Application.
	Impacts on local Great Crested Newt (GCN) populations if the Scheme is to be covered by a District Level Licence (DLL) – DLL has been used on several occasions linked with medium to large scale development over the past two years as Doncaster is within the DLL applicable area. The application of DLL over such extensive areas as proposed in the development should be passed by NE so as any issues that could arise during application are addressed at an early stage. It is considered that DLL has had some considerable benefit in the Doncaster area but there should be a precautionary approach taken. Three ponds have already been created in Doncaster as part of the DLL programme and it may be that pond creation can be linked to the DLL involvement of the Scheme.	The Applicant is engaging with NE to determine whether DLL is an appropriate mechanism to mitigate impacts of GCN from the Scheme.

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
	Effects of the Scheme on aquatic invertebrates - There is a growing amount of research being published on the impacts of solar arrays on invertebrates, especially aquatic invertebrates. A literature review to inform any monitoring of impacts was recommended and then monitoring that would contribute to wider research on this subject.	A full response regarding the potential effects to aquatic invertebrates from Solar PV Panels is set out in Table 8-1, in the response to the Planning Inspectorate (ID: 3.3.1).
	The scope of breeding, wintering and passage bird surveys, with particular consideration of potential effects on bird populations associated with internationally designated sites (Lower Derwent Valley SPA and Humber Estuary SPA) – Needs to also consider that overwintering species not associated with the statutory sites mentioned should also be taken into consideration.	The scope of bird surveys is set out in Table 8-3 of this chapter. The Applicant can confirm that the surveys give due consideration to all bird species, irrespective of association with a statutory site. A preliminary assessment of effects is presented in Section 8.11 of this chapter.
	The scope of bat surveys – These should be undertaken by skilled and knowledgeable bat ecologists and the surveys (bat transects and static monitoring) should be designed to include a full suite of bat surveys that cover the full extent of the development area. The use of the Site by foraging and commuting bats should be presented using 'heat' maps. Potential roost sites particularly trees need to be taken into consideration although it is acknowledged that the Scheme would largely avoid impacts on trees.	The scope of bat surveys is set out in Table 8-3 of this chapter, with full details included in **PEIR Volume III Appendix 8-4: Bat Survey Report**. A preliminary assessment of effects is presented in Section 8.11 of this chapter.
	Impacts of the Scheme on 'other notable mammals' such as Brown Hare, Hedgehog and	As detailed in Paragraph 8.4.20 of this chapter, specific surveys will not be needed to

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
	Polecat – It was requested that a scheme of monitoring studies is included in the proposals in order that the impacts of the proposals are taken fully into account. Evidence from other such developments applied at the planning and design stage should be presented to pre-empt any potential factors that could adversely impact the wider biodiversity and more discreet species-based issues.	inform the assessment for any mammals listed in accordance with S41 of the NERC Act (Ref. 8-9). Such species will be assumed to be present where the Site is within the known geographical range for these species, if there are desk study records of any such species occurring within 2 km of the Site Boundary and there is suitable habitat on Site to support them. Brown Hare are already known to be present at the Site from anecdotal sightings. Any embedded mitigation required for relevant SPI is included in Section 8.10 of this chapter. The proposed habitat creation and enhancement for the Scheme will be beneficial for these species.
Burnet Heritage Trust (BHT)	Concerns over the potential for the main site access to be made to the east of the Site; these access proposals have since been discounted in favour of a different location.	This comment is noted. The Applicant will continue to engage with the BHT to minimise environmental impacts through iterative design.
	The Scheme represents an opportunity for enhancing breeding success of Curlew *Numenius arquata* in the local area by providing appropriate buffer areas. BHT offered to provide details of anti-predator fencing that could aid Curlew breeding chances.	This comment is noted, and the Applicant welcomes the sharing of information. The Applicant will continue to engage with the BHT to incorporate measures which will maximise the ecological benefits of the Scheme, for species such as Curlew.
	Concerns about current land management onsite, including a large area of ploughed land that has not been ploughed for some time. BHTs concerns were that the Scheme was trying to change the ecological	The Applicant will use a wide range of sources to determine the habitats present within the Scheme with surveys ongoing in 2024. The ecological baseline would be determined at the time(s) of survey, but

Consultee	Summary of Consultation	How and Where Addressed in this PEIR
	baseline that would inform the assessment.	will be informed by others sources which may present previous presence or condition. Land management activities are currently determined by the existing landowners and would only become the Scheme's responsibility following DCO consent.

8.4 Assessment Methodology

8.4.1 This section sets out the scope and methodology for the preliminary assessment of the potential impacts of the Scheme on ecology and nature conservation.

Establishment of the Baseline Conditions

8.4.2 Establishment of the baseline environment, within the Study Area, Survey Areas and resulting ZoI, involved reference to existing data sources and field surveys, which are presented below.

Site and Study Area

8.4.3 The Site is the collective term for the Solar PV Site, Grid Connection Corridor and Existing National Grid Thorpe Marsh Substation (as defined in **PEIR Volume I Chapter 2: The Scheme**). Where ecological features are identified relevant to an individual element of the Scheme (such as the Solar PV Site or Grid Connection Corridor), then this is referred to throughout.

8.4.4 The Study Area was defined to include ecological features likely to be at risk from direct and indirect impacts that might arise from the Scheme and is the initial basis for determining the ZoI. The Chartered Institute of Ecology and Environmental Management (CIEEM) (Ref. 8-23) defines a ZoI as: *"…the area over which biodiversity features may be affected by biophysical changes as a result of the proposed project and associated activities"*.

8.4.5 The ZoI is based on:

a. The nature of the Scheme, activities, and the potential for effects at the construction, operation and maintenance, and decommissioning phases;

a. The nature of the land use (minimum 60 % arable) and habitats in the vicinity (majority being arable), the number of water courses and water bodies, their connectivity within and outside of the Site and how they may be used by different species or species groups;

b. The presence of ecological features in the wider area, based on the location of the Site and desk study data; and

c. The habits, behaviours and preferences of different species or species groups and whether these could be affected both spatially and temporally.

8.4.6 The Study Area captured all designated sites, sensitive habitats, and protected and notable species that occur, or potentially occur (where surveys are not complete) within the ZoI of the Scheme. The boundaries and zones for the Study Area reflect standard good practice and were informed by published guidance and professional judgement. This then enabled the identification of specific areas which required ecological survey (Survey Areas) (see Table 8-2) which are specific to a given species, group of species or habitat. The Study and Survey Areas defined are the maximum distances that statutory consultees would typically expect to be considered and these were presented within the EIA Scoping Report (**PEIR Volume III Appendix 1-1: EIA Scoping Report**), with no scoping responses received in any disagreement of this.

8.4.7 In defining individual Study Areas, consideration was given to the geographic location, nature and scale of the Scheme (refer to **PEIR Volume I Chapter 2: The Scheme**). For this Scheme, the Study Area, for which data were searched and collated through a desk study, is within the Site Boundary and up to:

a. 10 km from the Site Boundary for European sites, including hydrological connections, extended to 30 km for SAC that are designated for bats, or where bats are listed as a qualifying feature;

b. 2 km from the Site Boundary for sites statutorily designated for their biodiversity value at a National level (e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs);

c. 2 km from the Site Boundary for sites non-statutorily designated for their biodiversity value (e.g. Local Wildlife Sites (LWS), Sites of Importance for Nature Conservation (SINC));

d. 2 km from the Site Boundary for Ancient Woodland and Priority habitats;

e. 2 km from the Site Boundary for records (from the preceding ten years) of protected and notable species;

f. 2 km from the Site Boundary for records of protected or notable habitats, species and scheduled INNS;

g. 2 km from the Site Boundary for any applications for European Protected Species Licences and agri-environment schemes, e.g. Countryside Management Schemes; and

h. 2 km from the Site Boundary for the status of water bodies subject to the Water Framework Directive (WFD) (Ref. 8-16) which are assessed in **PEIR Volume I Chapter 9: Water Environment** and informed by the assessment of aquatic ecology receptors presented here. As impacts may propagate downstream in hydrologically-linked surface water bodies, the Study Area was extended beyond 2 km where data were not available within that zone.

Sources of Information

8.4.8 The Study Areas applied to different ecological features are defined in Paragraph 8.4.7.

8.4.9 Doncaster Local Records Centre (DLRC) was contacted in February 2023 and again in November 2023 following Scheme changes, to obtain information on the location of non-statutorily designated sites and for records of protected and notable habitats, species and INNS from the preceding ten years.

8.4.10 Protected and notable habitats and species are considered to be those listed under:

a. Schedules 1, 5 and 8 of the WCA (Ref. 8-1);

b. Schedules 2, 4 and 5 of the Conservation of Habitats and Species Regulations 2017 (Ref. 8-7); or

c. Section 41 (S41) of the NERC Act (Ref. 8-9) which lists species and habitats of principal importance (Species of Principal Importance (SPI) or Habitats of Principal Importance (HaPI)) for nature conservation in England.

8.4.11 Other habitats and species, such as those included in national, regional or local Red Data Books and Lists but not protected by legislation (this is consistent with the requirements of relevant planning policy) were also considered and have been assessed on a case-by-case basis.

8.4.12 South Yorkshire Badger Group (SYBG) were contacted in March 2023 (and again in November 2023) to request records of Badgers (including Badger setts) within and up to 100 metres (m) from the Site. However, records were not provided owing to concerns from SYBG that the information would not be treated as confidential and could result in harm to Badgers. Irrespective of this, the Applicant has undertaken and will continue to undertake detailed surveys for Badgers within the Site Boundary and up to 50 m (see Table 8-2), as presented in **PEIR Volume III Appendix 8-5: Badger Report (Confidential)** and summarised in this PEIR.

8.4.13 Online data resources that were reviewed include:

a. The Ramsar Sites Information Service (RSIS) website (Ref. 8-33) for site information and designation details of any Ramsar's identified within the relevant Study Area (refer to Paragraph 8.4.7);

b. The NE website (Ref. 8-35) for information on sites statutorily designated for their biodiversity value and to confirm reasons for designation and their condition;

c. Joint Nature Conservation Committee (JNCC) website (Ref. 8-36), for site information and designation details of SAC and SPA (including potential SPA (pSPA) and possible SAC (pSAC)) identified within the relevant Study Areas;

d. The Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref. 8-37) to identify the location (and details) of statutorily designated sites, ancient woodland, priority habitats and for any granted

European Protected Species Licence applications within 2 km of the Site;

e. Natural England's Ancient Woodland (England) inventory (Ref. 8-38) for the location of Ancient Woodland within 2 km of the Site;

f. Woodland Trust's ancient tree inventory (Ref. 8-39), for details of ancient, veteran or notable trees within the Study Area;

g. National Biodiversity Network (NBN) Atlas (Ref. 8-40) for open-source details on any protected and, or notable species recorded within 2 km of the Site;

h. Environment Agency Ecology and Fish Data for species records of fish, macroinvertebrate and macrophytes species (Ref. 8-41);

i. Environment Agency Catchment Data Explorer for data on WFD water bodies and water catchments (Ref. 8-42); and

j. Doncaster BAP (Ref. 8-28).

8.4.14 Records of INNS, as listed under Schedule 9 of the WCA, 1981 (as amended) (Ref. 8-1) and the Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref. 8-12) have been considered when assessing the likely significant ecological effects of the Scheme. The presence of such species is generally detrimental for ecology and there is legislation in place to control the spread of such species. Hence, it is important to consider the potential for the spread of any such invasive species and the likely significant effects resulting from this, and any mitigation that may be required to prevent it. The removal of such species may be desirable and beneficial for ecology. Likewise, measures should be taken to ensure that such invasive species are not inadvertently brought onto the Site. Therefore, while the species concerned are not relevant ecological features for the purposes of Ecological Impact Assessment (EcIA), there is still a need to consider them in terms of their potential relevance to delivery of legislative compliance (see Section 8.2 and **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**), for their potential to contribute to the amplification of any adverse effects arising from the Scheme, or their potential to conflict with biodiversity mitigation and enhancement proposals.

Field Surveys

8.4.15 The requirement for ecological field surveys was determined following a PEA, the results of which are reported within this chapter and **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**. The PEA consisted of three components: a desktop study data review, a Phase 1 Habitat survey and a scoping survey for protected species and other species of conservation concern.

8.4.16 The Phase 1 Habitat survey followed the standard JNCC method (Ref. 8-43) which, in summary, comprises a walkover to record the broad habitat types within the Site and up to 50 m from the Site Boundary, where these areas were accessible or viewable from within the Site.

8.4.17 A scoping survey to inform the likelihood of the habitats on Site supporting protected species was carried out in conjunction with the Phase 1 Habitat survey. This survey, also informed by the desk study, led to the

recommendation of field surveys for certain protected or notable species and notable habitats, as presented in Table 8-2.

8.4.18 Aquatic scoping (walkover) surveys were completed to assess the quality of targeted aquatic habitats (watercourses and ditches) within the Site where potential impacts were considered likely and these surveys were used to assess the potential for water bodies to support protected or notable species and inform further survey work.

8.4.19 Details of the Survey Areas (or anticipated Survey Areas where not yet undertaken or the requirement for survey is unconfirmed), methods, survey periods and guidance used for each survey are presented in Table 8-2. It is important to note that the extent of the Survey Area varies according to the ecological feature in question and with regards to the precautionary principle i.e. if there is doubt as to whether an area should be surveyed, it is included in the Survey Area. Accordingly, the Survey Areas used in this assessment ensured sufficient data were gathered to meet any design iterations which may change the likely ZoI used to undertake the impact assessment.

8.4.20 Ecological surveys undertaken to data have noted the presence of Brown Hare within the Site, but no species-specific surveys for any mammals listed in accordance with S41 of the NERC Act (Ref. 8-9) (e.g. Brown Hare, Hedgehog, Polecat and Harvest Mouse *Micromys minutus*) will be undertaken as part of the assessment. Instead, where the Site is within the known geographical range for these species, if there are desk study records of any such species occurring within 2 km of the Site Boundary and there is suitable habitat on Site to support them, then they are assumed to be present. Consideration for any embedded mitigation required for relevant SPI is included in Section 8.10 of this PEIR and will be refined and updated in the ES, submitted as part of the DCO Application. It is anticipated that the proposed landscape design for the Scheme will be largely beneficial for these species.

8.4.21 Ponds and ditches located within and close to the Site may support common and widespread amphibian species (e.g. Common Frog *Rana temporaria*, Common Toad *Bufo bufo* and Smooth Newt *Lissotriton vulgaris*) and the Site also offers suitable terrestrial habitats for these species in the form of hedgerows, scrub, semi-improved grassland and woodland. Surveys are not required for such species, but observations of these species have been recorded and will continue to be recorded during ecological surveys. These species receive limited legislative protection, although Common Toad is a SPI and mitigation included in Section 8.10 of this PEIR has considered their presence, or potential presence.

8.4.22 Ecological field surveys are ongoing, having commenced in February 2023 and will continue into 2024, to characterise the ecological baseline within the relevant Survey Areas.

8.4.23 Table 8-2 presents details of the coverage, methods and survey periods (either undertaken where completed, or proposed) within the relevant Survey Areas. Where surveys have been completed and data are available to inform the characterisation of the baseline in this chapter, this is identified in Table 8-2. Table 8-2 also identifies those remaining surveys that are still in progress or are planned for within the appropriate survey windows across

the Site. The data gathered from these surveys will be used to inform the assessment presented in the ES.

Table 8-2: Ecological Surveys that have been, or will be, Undertaken to Characterise The Baseline Conditions

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
Phase 1 habitat survey	Walkover survey recording the habitat types and boundary features present following the standard JNCC method (Ref. 8-43). The habitat mapping will also inform the requirement for further detailed botanical surveys, where necessary.	The land within the Site and a buffer zone of 50 m (where visible/accessible).	Using professional judgement, 50 m is an appropriate Survey Area, acknowledging that terrestrial habitats that are likely to be directly impacted by the Scheme are within the Site. The 50 m buffer is appropriate in evaluating adjacent habitats and informing on the potential presence, or otherwise, of protected species within the vicinity of the Scheme.	Yes, habitat information is included for the areas of the Solar PV Site that were surveyed in March, April and October 2023 and for where priority habitats have been identified during the desk study.	Yes, surveys are ongoing across the Site and will commence again from Spring 2024.
Botanical Surveys	Surveys for important arable plant species involve walking arable field boundaries to record notable species as listed in Great Britain	The Survey Area is within the Site and areas of terrestrial habitat to be surveyed in further detail are those with the potential to be affected by the	Using professional judgement, habitat within the Site is an appropriate Survey Area, acknowledging that habitats that are likely to be impacted by the Scheme are within the Site itself. The surveys	No detailed survey information is included, however, this PEIR does include desk study data and high-level	Yes, targeted surveys across the Site will be undertaken in Spring/Summer 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	(Ref. 8-44) and England (Ref. 8-45). Other terrestrial habitat surveys to include mainly grassland (including any relevant roadside verges) involve surveying such areas in more detail (i.e. species lists with abundance ratings).	Scheme that will include priority or potential priority habitats, as identified from the initial Phase 1 Habitat survey and desk study information.	will identify any areas of notable habitats or important for flora and inform any required avoidance, mitigation or enhancement.	habitat data (from the Phase 1 survey) to inform the preliminary assessment of the potential impacts on arable flora and grassland.	
Habitat Condition Assessment for BNG	Identification of the UKHab type (Ref. 8-46) and a habitat condition assessment will be undertaken where required for the purpose of BNG assessment.	All habitats within the Site.	As required for the purpose of a BNG assessment.	Not required at this stage.	Yes, surveys across the Site will be undertaken, as required, in Spring/Summer 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
Hedgerows	Hedgerows will be surveyed in accordance with the methodology as outlined in Defra's Hedgerow Survey Handbook (Ref. 8-47), to assess their 'importance' against the Wildlife and Landscape Criteria, detailed in the Hedgerows Regulations (Ref. 8-11) and to determine whether a hedgerow is species-poor or species-rich. A habitat condition assessment will also be undertaken for the	Hedgerows within the Site.	Using professional judgement, surveying hedgerows within the Site is appropriate, acknowledging that those hedgerows that are likely to be impacted by the Scheme are within the Site itself. Hedgerows outside the Site will remain intact and unaffected by the Scheme.	No detailed information is included on the importance of hedgerows. However, this PEIR does include a preliminary assessment of the potential impacts on hedgerows, given their known presence within the Site from the desk study and Phase 1 survey.	Surveys will be undertaken across the Site, using the methods described in this table, in Spring/Summer 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	purpose of BNG assessment.				
Aquatic habitat walkover (scoping) survey. Fish, macroinvertebrate and macrophyte surveys, including aquatic and riparian INNS are to be completed.	Accessible and safe stretches of water body banks were walked, noting physical habitat features such as riparian cover, channel substrate, habitat type, modifications, and in-stream vegetation to assess the potential for water bodies to support protected or notable species and inform further survey work. Survey method for streams and ditches will follow the aquatic	Water bodies identified during the aquatic scoping survey and desk study for further survey within the Site, based on likely impacts to ordinary watercourses and ditches. Main rivers were scoped out due to the commitment to cross these watercourses by non-intrusive techniques, with the exception of fish surveys where there remains the potential for impacts on	The land within the Site is an appropriate Survey Area to determine any potential impacts arising from the Scheme both upstream and downstream (also informed by desk study, which assesses a wider 2 km ZoI). The Preliminary Ecological Appraisal (PEA) report, as presented in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**) includes a desk-study undertaken on the 23 February 2023 and a walkover survey of accessible land within and adjacent to the Site in March and April 2023. Further surveys will be	Summary of aquatic habitats present within the Site to inform requirements for further aquatic ecology surveys, based on desk-top study and walkover results presented in the PEA Report.	Surveys will be undertaken across the Site, using the methods described here, in Spring/Summer/Autumn 2024

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	macroinvertebrate sampling procedures standardised by the Environment Agency in 2017 (Ref. 8-48) and the UKTAG River Assessment Method (Macrophytes and Phytobenthos) for use with LEAFPACS2 (Ref. 8-49) and for electric fishing surveys.	receptors in relation to European sites.	undertaken of the River Went, Fleet Drain, and Fenwick Common Drain, to assess habitat suitability for River and Sea Lamprey, and if necessary, carry out electric fishing surveys for these and other fish species. Any further surveys will only be undertaken if impacts to these watercourses are unavoidable.		
Terrestrial Invertebrates	A walkover survey, undertaken by a specialist entomologist, to identify areas of likely greater importance to terrestrial	All habitats within the Site that may be permanently impacted.	Using professional judgement, surveying habitat within the Site only is appropriate, acknowledging that habitats that have the potential to be permanently impacted (i.e. lost) by the Scheme	No specific survey information is included, but a summary of terrestrial habitats present within the Site, identified	Walkover survey and any sample-surveying to be undertaken in Spring/Summer 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	invertebrates, e.g. semi-natural grasslands, followed by sample-surveying to appraise the broad level of terrestrial invertebrate interest within such areas.		and potentially supporting notable terrestrial invertebrates or assemblages are within this area. The surveys will identify any areas likely to be important for terrestrial invertebrates and inform any required avoidance, mitigation or enhancement. No surveys will be undertaken for terrestrial invertebrates within the Grid Connection Corridor as the temporary nature of the construction of the Grid Connection Cables will not significantly impact upon any terrestrial invertebrates, or their habitats, in these areas.	through the Phase 1 habitat survey, is included to inform the preliminary assessment of the potential impacts of the Scheme on terrestrial invertebrates.	
GCN	Habitat Suitability Index (HSI) surveys to	Water bodies within 500 m of the Site were	With reference to published guidance, habitats within and up to	Yes, desk study information is included and	The Applicant is currently engaging with Natural England to

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	evaluate the suitability of water bodies and their potential to support GCN (Ref. 8-50). Further to the HSI assessment, suitable (as defined by the results of the HSI survey) any accessible water bodies identified within the Survey Area are then scoped in for Environmental DNA (eDNA) survey (Ref. 8-51) to determine presence or absence of GCN.	identified during the Preliminary Ecological Appraisal and further surveys will, or have been, undertaken on water bodies within 250 m of the Site, as required.	250 m of the Site could constitute significant foraging areas, hibernation or resting sites for GCN, which typically utilise terrestrial habitat up to 500 m from their breeding ponds (Ref. 8-52). However, 250 m is considered an appropriate Survey Area from the Site for HSI and eDNA surveys, acknowledging that there is a notable decrease in abundance of GCN beyond a distance of 250 m from a breeding pond (Ref. 8-53). As a DLL will be applied for, this process will inform the ES, including information of the Scheme's likely impacts on GCN.	from a limited number of HSI and eDNA surveys that were undertaken in Spring 2023 and the data from these are being used to inform the DLL application.	determine whether DLL is a suitable approach for the Scheme. If further surveys are required, then these will be undertaken in 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
Reptiles	Surveys of terrestrial habitats for reptiles to record species presence (or absence) using artificial refugia and observations of species in accordance with Froglife's Advice Sheet 10 (Ref. 8-54) and Natural England's Standing Advice Sheet for reptiles (Ref. 8-55).	Suitable habitat for reptiles (such as grassland or margins) within the Site Boundary that is potentially directly impacted by the Scheme.	With reference to published guidance, the Survey Area provides sufficient information on reptile and amphibian presence within the Site, acknowledging that habitats that have the potential to be permanently impacted (i.e. lost) by the Scheme and potentially supporting reptiles are within this area.	Yes, desk study data and results of surveys completed within the Solar PV Site in May, June and September 2023.	A habitat suitability assessment for reptiles within the Grid Connection Corridor will be undertaken in April/May 2024. Where suitable habitat exists for a reptile population, and direct impacts cannot be avoided, then further presence/absence surveys will be undertaken to inform mitigation.
Breeding birds	Surveys for breeding birds are based on a standard method for surveying breeding birds as detailed in 'Bird Monitoring Methods' (Ref. 8-	For the general breeding bird assemblage, the Survey Area is defined as the land within the Site and to a maximum of 50 m from the Site. For	Standardised survey buffers for assessing the impacts of development on bird populations do not exist, however, the Survey Area provides information on the breeding birds within the area immediately	Yes, desk study results and inclusion of results of surveys of breeding birds undertaken within the Survey Area	Yes, further surveys within the Site will be undertaken within any areas not previously surveyed (e.g. where there was no access) in 2023 and these will be undertaken between March and June 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	56) and 'Bird Census Techniques' (Ref. 8-57); and were adapted where necessary to include species-specific methods (as detailed in 'Bird Monitoring Methods' (Ref. 8-56)) for other species, as required.	species of greater conservation value and/or higher sensitivity, e.g. those listed on Schedule 1 of the WCA (Ref. 8-1) and sensitive to potential noise or visual disturbance, where any such species were recorded, the survey area was extended up to 200 m from the Site, e.g. Hobby (*Falco Subbuteo)* and Barn Owl.	surrounding the Site and includes areas contiguous with the Site, where birds may potentially be adversely affected. Depending on the sensitivity of the species, birds occurring outside of the survey area may also be adversely affected (for example those listed on Schedule 1 of the WCA) and therefore where any such species are recorded beyond the 50 m survey buffer (up to 200 m from the Site), these have also been recorded. However, the 50 m survey buffer is sufficient to determine the likely impacts of the Scheme on breeding bird species occurring or likely to occur in the area.	between March and July 2023.	

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
Non-breeding (Wintering and Passage) Birds	Non-breeding bird surveys, using an adapted walkover survey method including frequent stopping points to view and observe bird behaviour, as detailed in 'Bird Monitoring Methods' (Ref. 8-56) and 'Bird Census Techniques' (Ref. 8-57).	The land within the Site and to a maximum of 500 m from the Site will be surveyed.	Whilst standardised survey zones for assessing the impacts of development on bird populations do not exist, the Survey Area provides information on the non-breeding bird population within the area immediately surrounding and contiguous with the Site, where birds may potentially be adversely affected, either directly or indirectly. Therefore, the Survey Area is sufficient to determine the likely impacts of the Scheme on non-breeding bird species occurring or likely to occur in the area.	This PEIR does include a preliminary assessment, based on desk study results and an incomplete dataset of monthly surveys undertaken between September 2023 and January 2024, but surveys are ongoing to provide detailed information on the importance of the Site for non-breeding birds.	Yes, a full assessment of non-breeding birds will be presented with the ES, following completion of the surveys in February and March 2024.
Bats – Daytime Bat Walkover (DBW) Survey and Ground	Trees to be impacted or subject to	Relevant features (i.e. trees) within the Site, where	Information collated on the location of trees that are suitable for roosting	Yes, data available from the desk study	Prior to submission of the ES, a DBW survey (which can be

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
Level Tree Assessment (GLTA).	disturbance (above existing levels) will be subject to daytime bat walkover assessment, followed by a ground level tree assessment (GLTA) where impacted in accordance with The Bat Conservation Trust guidance (Ref. 8-58).	accessible and likely to be impacted by the Scheme.	bats will inform design and offset buffers to avoid direct effects upon potential roost sites (and avoidance of trees and woodland with higher ecological value irrespective of bats which should be avoided). Furthermore, the information will form the basis of the scope for roost surveys (as detailed below).	and for surveys undertaken within accessible areas of the Solar PV Site in 2023.	undertaken at any time of year) of areas of the Solar PV Site that were previously inaccessible and the Grid Connection Corridor will be undertaken, where there is a potential for loss of roost features.
Bats – Roost Surveys	Where tree removal has been confirmed prior to ES submission, climb and inspect tree and/or bat emergence surveys will be undertaken at dusk in	Features with bat roost suitability identified during the GLTA that will be impacted by the Scheme (i.e. if the design cannot avoid the loss of trees).	Based on the current Scheme layout, it is anticipated that impacts to potential roosts are likely to be avoided and that any further survey work, if required is likely to be minor (i.e. possibly a few individual trees)	No.	If required (i.e. there is certainty that trees potentially supporting bat roosts will be removed prior to ES submission), roost surveys will be undertaken between May and September 2024.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	accordance with standard survey guidance (Ref. 8-58).		and on a precautionary basis.		
Bats – Foraging/Commuting	Four targeted walked transect routes, to cover suitable areas of affected habitats within the Solar PV Site; each transect surveyed three times in spring, summer and autumn. The survey methodology is based upon published guidance available in Spring 2023 (Ref. 8-59), tailored as necessary to suit the Solar PV Site. The surveys have	Four transects sampling representative habitats within the Solar PV Site.	The Solar PV Site is predominantly arable and low value improved/semi-improved grassland, offering low suitability for foraging/commuting bats, with the majority of higher value boundary habitats (hedgerows, watercourses, woodland) being retained.	Yes, data available from the desk study and for surveys undertaken within the Solar PV Site in Spring (May), Summer (July) and Autumn (September) 2023.	An additional bat activity survey will be undertaken along the Grid Connection Corridor to cover the large construction compound and potentially other habitat loss along this Grid Connection Corridor.

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	been supplemented by the deployment of static bat detectors, one per transect.				
Riparian mammals (Water Vole *Arvicola amphibius*, Otter *Lutra lutra* and Mink *Mustela vison*)	Undertake a Habitat Suitability Assessment (HSA) to determine the suitability of each watercourse or water body for riparian mammals. Then survey watercourses and water bodies, deemed suitable for riparian mammals for evidence of Water Vole and Otter activity, following methods as described in the	Undertake the HSA on all watercourses and water bodies within the Site (and up to 250 m upstream and downstream of the River Went, owing to the presence of Otter), with only those watercourses and water bodies that are identified as being suitable to support riparian mammals subject to detailed surveys.	With reference to published guidance and using professional judgement, surveying riparian habitats up to 10 m is sufficient for the majority of watercourses to determine presence or absence of riparian mammals within, or adjacent to, watercourses as it covers the 10 m distance of avoidance around Water Vole burrows. The Survey Area around the River Went is extended to include disturbance distances for any potential Otter holts.	Yes, desk study data and survey data available for a limited number of surveys undertaken on watercourses within the Solar PV Site in June 2023.	Further HSA surveys will be undertaken within the Site Boundary in Spring and Summer 2024 where such areas could not be accessed in 2023. Where detailed surveys are required, presence/absence surveys will also continue in Spring and Summer 2023 to look for field signs along suitable watercourses and ditches, where open cut crossing techniques are required, or appropriately sized

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	'Water Vole Conservation Handbook' (Ref. 8-60) and 'The Water Vole Mitigation Handbook' (Ref. 8-61), guidance in the 'New Rivers and Wildlife Handbook' (Ref. 8-62); the 'Fifth Otter Survey of England 2009-2010' (Ref. 8-63) and the 'Ecology of European Otter' (Ref. 8-64). Record any evidence of Mink, using these survey methods.	Additional surveys of woodland in the vicinity of water courses will also be checked for Otter holts.			stand-off buffers cannot be applied.
Badger	A walkover survey, searching for signs of Badger activity	Within the Site and to a maximum of 50 m from the Site, where	With reference to published guidance and applying professional judgement, 50 m beyond	Yes, desk study data and survey data available for the Solar PV	Yes, surveys to be completed across the Site, where required and including the Grid

Survey	Survey Method	Survey Area	Supporting Notes	Information Available for Inclusion within this PEIR?	Further Information Required for the ES?
	(such as setts and latrines), as described in the Mammal Society publication 'Surveying Badgers' (Ref. 8-65) and with reference to 'Surveying for Badgers: Good Practice Guidelines' (Ref. 8-66).	viewable from within the Site or where access was permitted.	the Site is an appropriate Survey Area as it covers the 30 m distance of avoidance around setts at which direct or indirect effects on Badger setts could occur.	Site only, where accessed during surveys undertaken in February and March 2023.	Connection Corridor. The full data set will be reported as a confidential appendix within the ES
INNS	INNS species observations will be recorded when noted during other ecological surveys. Plants will include notes on precise location and stand size.	Site wide observations of any INNS species will be recorded throughout pre-construction surveys, and during construction.	INNS will be recorded to avoid and reduce the spread of any INNS species before, during and after construction.	Desk study results available and any observations of INNS from during ecology surveys (e.g. aquatic surveys) undertaken within the Solar PV Site in 2023.	Yes, any INNS identified in surveys scheduled to be undertaken in 2024 between PEIR and ES will be submitted with the ES.

Biodiversity Net Gain

8.4.24 Surveys to inform the BNG assessment will be undertaken as appropriate to record the area (or length) of each habitat measured alongside a habitat condition assessment in line with UKHab (Ref. 8-46) and guidance for river and ditch condition assessment (Ref. 8-67, Ref. 8-68). Biodiversity metrics provide a measure of overall biodiversity value based on habitat type, area, condition, strategic significance and distinctiveness. The current approved metric is the statutory biodiversity metric tool (Ref. 8-69) that allows a value to be measured, in this case biodiversity, which is calculated pre- and post-development for three habitat components: habitats, watercourses, (rivers and streams) and hedgerows. The change in biodiversity units is calculated for each component and indicates either a net loss, a net gain or no change in biodiversity.

8.4.25 Compliance with planning policy in the NPPF (Ref. 8-20) requires that the Scheme considers and engages a mitigation hierarchy, requiring the highest level to be applied, where practicable. The mitigation hierarchy is also fundamental to BNG and there are four sequential steps that must be taken throughout the lifecycle of a project, where there is potential for impacts on relevant ecological features:

a. Avoidance – actions taken to avoid causing impacts to the environment prior to beginning development (e.g. moving part of the development to a different location);

b. Minimisation – measures taken to reduce the duration, intensity, extent and/or likelihood of the unavoidable environmental impacts caused by development (e.g. adapting the development design to minimise impacts);

c. Restoration or rehabilitation – actions taken to repair environmental degradation or damage following unavoidable impacts caused by development; and

d. 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).

8.4.26 Schedule 15 of the Environment Act, 2021 (Ref. 8-6) makes provision for BNG in relation to development consent for NSIPs. Although the requirement for a minimum 10 % gain in biodiversity for NSIP will not become mandatory until a future date (anticipated to be November 2025), the Scheme will achieve at least this level of net gain in habitat units (as set out in the incoming legislation).

8.4.27 NPS EN-1 (Ref. 8-17) also sets out how BNG should be addressed for Energy NSIP proposals and how proposals should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, where practicable; and that BNG should be applied after compliance with the mitigation hierarchy (above) and does not change or replace existing environmental obligations.

8.4.28 CIEEM's Biodiversity Net Gain: Good Practice Principles for Development (Ref. 8-70) defines BNG as "*development that leaves biodiversity in a better state than before"* and involves *"an approach where developers work with*

local governments, wildlife groups, landowners and other stakeholders in order to support their priorities for nature conservation". BNG is achieved when measurable improvements for biodiversity are delivered in association with a development through the creation of new habitats or enhancement and management of existing habitats. Whilst BNG allows for these measures to be provided within the Site, outside of this, or in combination, the Scheme will deliver BNG within the Solar PV Site, through the implementation of measures such as field boundary enhancements and planting appropriate seed mixes.

8.4.29 The BNG assessment has not been undertaken at this stage as the design for the Scheme continues to evolve. However, a BNG assessment will be submitted with the ES as part of the DCO application. Prescriptions for the establishment, long term management and monitoring of habitat creation measures will be detailed within the Framework LEMP.

8.4.30 The BNG assessment, therefore, will identify the opportunities of the Scheme, contributing to BNG, in line with the requirements of the Environment Act 2021 (Ref. 8-6), NPS EN-1 (Ref. 8-17), the NPPF (Ref. 8-20), CIEEMs Good Practice Guidance (Ref. 8-70) and local planning policy (see Paragraph 8.2.7).

8.5 Impact Assessment Methodology

8.5.1 The preliminary impact assessment, detailed in this chapter, has been carried out in accordance with good practice guidance for EcIA, issued by CIEEM (the CIEEM Guidelines) entitled 'Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Costal and Marine' (Ref. 8-23) as summarised below.

8.5.2 The aims of the assessment are to:

a. Identify important ecological features (IEFs), such as designated sites, protected habitats and species which may be impacted by the Scheme;

b. Provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant likely significant effects of the Scheme. Impacts and effects may be positive or negative;

c. Facilitate scientifically rigorous and transparent determination of the consequences of the Scheme in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and

d. Set out what steps will be taken to adhere to legal requirements relating to the relevant ecological features concerned.

8.5.3 The principal steps involved in the CIEEM approach can be summarised as determining:

a. Ecological features that are both present and might be affected by the Scheme are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;

b. The importance of the identified ecological features is evaluated, placing their relative nature conservation importance into geographic context, which is then used to define the relevant biodiversity features that need to be considered further;

c. The changes or perturbations predicted to result as a consequence of the Scheme (i.e. the potential impacts) and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;

d. The likely effects (positive or negative) on relevant ecological features are then assessed and, where possible, quantified;

e. Measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines) and if necessary, measures to compensate for effects on features of nature conservation importance are also included; and

8.5.4 Any residual effects of the Scheme are then presented. It is not necessary in the assessment to address all habitats and species with potential to occur in the relevant Study Areas and instead the focus is on those that are 'relevant' i.e. ecological features that are considered to be important and potentially affected by the Scheme. This does not mean that efforts should not be made to safeguard wider biodiversity and requirements for this have been considered, where appropriate.

Determining Importance

8.5.5 To support a focussed assessment, there is a need to determine the scale at which the relevant ecological features identified through the desk studies and field surveys undertaken for the Scheme are of value. The value of each relevant ecological feature has been defined with reference to the geographical level at which it matters, informed through relevant planning policy and legislation (see **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**) which is important in demonstrating how the Scheme will comply with statutory requirements and policy objectives for biodiversity, in accordance with Section 4.3 of the CIEEM guidelines (Ref. 8-23).

8.5.6 Species populations are valued on the basis of their size, recognised status (such as through published lists of species of conservation concern and designation of BAP status) and legal protection. For example, bird populations exceeding 1 % of published information on biogeographic populations are considered to be of international importance, those exceeding 1 % of published data for national populations are considered to be of national importance, and so on.

8.5.7 In assigning values to species populations, it is important to take into account the status of the species in terms of any legal protection. However, it is also important to consider other factors such as its distribution, rarity, population trends and the size of the population which would be affected. For example, whilst the GCN is protected as a European protected species

under the relevant legislation and therefore conservation of the species is of significance at an international level, this does not mean that every population of GCN is internationally important. It is important to consider the particular population in its context. Therefore, in assigning values to species, the geographic scale at which they are important has been considered. The assessments of value rely on the professional opinion and judgment of experienced ecologists.

8.5.8 Plant communities are assessed both in terms of their intrinsic value and as habitat for protected species whose habitat is also specifically protected and for species of nature conservation concern which are particularly associated with them.

8.5.9 Due regard will also be paid to the legal protection afforded to species during the development of mitigation and compensation measures to be implemented for the Scheme. For European protected species there is a requirement that the Scheme should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

8.5.10 For the purposes of the assessment within this chapter, only ecological features of at least Local importance are considered as IEFS that require assessment for potential significant effects. Whilst consideration of impacts at all geographic scales is important, features of less than Local importance (i.e. of Site importance) are common and widespread (therefore of no local value) and are not legally protected or included within local planning policy. The CIEEM guidelines (Ref. 8-23) make it clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*".

8.5.11 Assessing the value of features requires consideration of both existing and future predicted baseline conditions. Therefore, the description and valuation of ecological features takes account of any likely changes, such as trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other Schemes or land use changes, as explained in the 'Future Baseline' (no development) section of this PEIR.

8.5.12 A summary of the value (importance) of ecological features and the geographical frames of reference used for this assessment, based on Section 4.7 in the CIEEM guidelines (Ref. 8-23), is presented in Table 8-3.

Table 8-3: Summary of Sensitivity of Ecological Features, According to Geographic Context

Sensitivity (Value)	Geographic Frame of Reference	Examples
Very High	International	Statutorily designated sites, such as Ramsar Sites, SACs (including candidate SACs), SPAs, normally within the geographic area of Europe.

Sensitivity (Value)	Geographic Frame of Reference	Examples
		Species occurring in numbers approaching that of international importance (i.e. >1% of a biogeographic population).
High	UK or National (Great Britain), but considering the potential for certain ecological features to be more notable (of higher value) in England, with context relative to Great Britain as a whole)	Statutorily designated sites, such as a SSSI or NNR. HaPI (Ref. 8-9), considering factors such as its size, distribution and the extent of the habitat which would be affected. SPI (Ref. 8-9) occurring in numbers approaching that of national importance (i.e. >1% of the UK population).
Medium/High	Regional (Yorkshire and the Humber)	Species, including SPI (Ref. 8-9) occurring in numbers of greater geographical importance than within the county of South Yorkshire but does not reach the threshold to be of National importance.
Medium	County (South Yorkshire) and/or District (Doncaster)	Non-statutorily designated sites, such as LWS. HaPI (Ref. 8-9) not representing a nationally important habitat, but recognised as a Local BAP habitat which would or may fulfil the criteria for selection as a LWS. Species occurring in numbers approaching that of county or district

Sensitivity (Value)	Geographic Frame of Reference	Examples
		importance (i.e. >1% of the county or district (if known) population).
Low	Local	Species of conservation interest e.g. SPI/Doncaster BAP species that contribute to the local biodiversity i.e. species are of conservation value but are still common and widespread. Areas of habitat that do not meet criteria for selection as LWS in South Yorkshire but are considered to enrich the local area.
Negligible	Site	Species that are common and widespread and are not legally protected or included within local planning policy (e.g. Field Vole *Microtus agrestis*). Areas of habitat that are widespread and of no local value (such as a fence-line or hard-standing).

Characterising Ecological Features

8.5.13 In accordance with Section 1.21 in the CIEEM guidelines (Ref. 8-23), the terminology used within the assessment draws a clear distinction between the terms ‘impact’ and ‘effect’. For the purposes of this chapter, these terms are defined as follows:

a. Impact – actions resulting in changes to an ecological feature. For example, construction activities of a development removing a hedgerow; and

b. Effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature e.g. the effects on a population of bats as a result of the loss of a bat roost.

8.5.14 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

a. Positive or negative – i.e. is the change likely to be in accordance with nature conservation objectives and policy and is that change:

   i. Positive – a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value; or

   ii. Negative – a change that reduces the quality of the environment e.g. destruction of habitat.

b. Spatial extent – the spatial or geographical area or distance over which the impact or effect may occur under a suitably representative range of conditions;

c. Magnitude – the 'size', 'amount' or 'intensity' and 'volume' of an impact – this is described on a quantitative basis, where possible;

d. Duration – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;

e. Timing and frequency – i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons; and

f. Reversibility – i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale i.e. the expected 40-year lifespan of the Scheme (in the context of the feature being assessed).

8.5.15 Combined, these characteristics form the magnitude criteria for effects of the Scheme on IEFs as summarised in Table 8-4.

Table 8-4: Magnitude Criteria for Effects

Magnitude	Examples
High	Changes to the ecological feature pre-development (baseline) condition that almost always have an effect (positively or negatively) on its integrity or conservation status. Such changes may be long-term, permanent and/or irreversible.
Medium	Changes to the ecological feature baseline condition that in some circumstance may affect (positively or negatively) its integrity or conservation status. Although such changes may be long-term, they are potentially reversible.

Magnitude	Examples
Low	Changes on an ecological feature that do not usually affect the baseline condition and are often short-term and/or reversible.
Very low	There is no noticeable change to the ecological feature baseline condition.

Significance Criteria

8.5.16 For each ecological feature, only those characteristics relevant to understanding the ecological effect of the Scheme and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

a. Not significant – no effect on structure and function, or conservation status; and

b. Significant – structure and function, or conservation status is affected.

8.5.17 Sections 5.24 to 5.28 in the CIEEM guidelines (Ref. 8-23) state that effects should be determined as being significant (a 'significant effect') when "*an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)*".

8.5.18 Using this information and professional judgement, it is determined whether the effects will be 'significant' or 'not significant' on the structure and integrity of site or ecosystems or conservation status of habitats and, or species of each ecological feature and the impact significance is determined at the appropriate geographical scale, as presented in Table 8-3.

8.5.19 There are a number of approaches for determining the significance of effects on ecological features. Whilst the CIEEM guidelines (Ref. 8-23) recommend the avoidance of the use of the matrix approach for categorisation (major, moderate and minor), in order to provide consistency of terminology within this PEIR, the terminology used in the CIEEM guidelines for impact assessment have been translated into the classification of effects scale, as outlined in Table 8-5, but still remain consistent with the CIEEM guidelines. As a rule, major and moderate effects are considered to be significant, whilst minor and neutral/negligible effects are considered to be not significant. However, professional judgement will be applied, including taking account of whether the effect is permanent or temporary, its duration and frequency, whether it is reversible, and/or its likelihood of occurrence. Within this

chapter, ecological effects are only described as being either significant or not significant and the level of effect, as set out in Table 8-5 is not given at this stage, as the full ecology surveys and data analysis are not yet complete.

Table 8-5: Significance Criteria for Effects

Effect Classification Terminology	Equivalent CIEEM Terminology
Major beneficial (positive)	1) Beneficial effect on structure/function or conservation status at a regional, national or international level; and 2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Moderate beneficial (positive)	1) Beneficial effect on structure/function or conservation status at a county level; and 2) The extent, magnitude, frequency, and/or timing of an impact positively affects the integrity or key characteristics of the resource.
Minor beneficial (positive)	1) Beneficial effect on structure/function or conservation status at a local level; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Negligible	No effect on structure/function or conservation status.
Minor adverse (negative)	1) Adverse effect on structure/function or conservation status at a local level; and 2) The extent, magnitude, frequency, and/or timing of an impact does not affect the integrity or key characteristics of the resource.
Moderate adverse (negative)	1) Adverse effect on structure/function or conservation status at a county level; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.
Major adverse (negative)	1) Adverse effect on structure/function or conservation status at a regional, national or international level; and 2) The extent, magnitude, frequency, and/or timing of an impact negatively affects the integrity or key characteristics of the resource.

8.6 Assumptions, Limitations and Uncertainties

8.6.1 The preliminary assessment presented in this chapter reflects the information obtained and evaluated at the time of reporting (February 2024),

and has referenced published data, records and web-based information obtained to date. A final assessment will be undertaken as part of the EIA and will be reported in the ES that will be submitted with the DCO application.

8.6.2 The preliminary assessment includes consideration of the construction, operation and maintenance, and decommissioning phases of the Scheme and is based upon the maximum parameters of design for the Scheme and preliminary design information (refer to **PEIR Volume I Chapter 2: The Scheme**) presented in **PEIR Volume II Figure 2-3: Indicative Site Layout**).

8.6.3 As noted in **PEIR Volume I Chapter 2: The Scheme**, subject to being granted consent and following a final investment decision, the earliest construction could start is 2028. Construction would require an estimated 18 to 24 months, with the Grid Connection Corridor anticipated to require a 12 month construction period and the Solar PV Site an estimated 24 months. Should the construction programme be extended, this will not change the results of the EIA with respect to flora, as the impact is not affected by the duration of activity but rather the change or loss of any habitats. The impact on fauna is likely to be similar if the construction period is extended, with respect to any habitat loss. However, a longer construction period could potentially result in the increased magnitude of certain impacts (e.g. prolonged noise disturbance).

8.6.4 Habitat and species information referenced in the assessment has been collected from site surveys undertaken on land within and around the Site between February 2023 to January 2024, where permission to access the land was obtained from landowners (see Table 8-2). Where any survey data are currently incomplete or limited, and further work is required to inform the assessment, this is also presented within Table 8-2, which contains a summary of work that will be completed for the ES. The preliminary assessment undertaken for this PEIR is therefore based upon a review of desk study data, aerial photography and the field survey data collected up to January 2024. It is noted that although some field survey data have been collected in 2023, these are not complete datasets and have not been analysed in time for inclusion and consideration in this PEIR. Where this is the case, this is stated in Table 8-2. Complete datasets will be presented within the ES.

8.6.5 Since the scoping process was undertaken, the design of the Scheme has evolved and the current Site boundary is presented in **PEIR Volume II Figure 1-2: Site Boundary Plan**. This evolution has included the addition of a number of land parcels to the south of the Scheme, and this change was actioned after the majority of appropriate seasonal windows for surveys had closed in 2023. However, ecological surveys will be undertaken within the appropriate survey windows, where required in 2024, and the data from these will inform the Ecology chapter for the ES that will accompany the DCO application.

8.6.6 Field surveys to inform this PEIR have been undertaken within the Solar PV Site only with no formal surveys undertaken to date within the Grid Connection Corridor, due to access restrictions. Whilst sufficient information has been obtained from the desk study to inform on the locations of non-statutory sites within the vicinity of the Grid Connection Corridor and limited

desk study information on the locations of protected species and notable habitats (such as from MAGIC (Ref. 8-37)), surveys to validate and confirm the presence, or otherwise, of protected and notable habitats and species will be undertaken in 2024 as access becomes available. This information will be presented in the final ES and submitted as part of the DCO application.

8.6.7 Owing to the levels of traffic expected to be generated by the Scheme being below relevant criteria, as set out in **PEIR Volume I Chapter 14: Other Environmental Topics**, a detailed dispersion modelling exercise is not proposed to be undertaken for the Scheme and the effect can be considered to be not significant. Therefore, this chapter does not consider potential effects on ecological features (habitats, sites and species) as a result of changes in air quality due to construction and decommissioning traffic, as no significant effects are anticipated at this stage. This will be reviewed as part of the ES as should there be any changes to anticipated vehicle movements that subsequently trigger threshold levels, dispersion modelling will be undertaken as part of the EIA and reported in the ES in order to quantitatively determine the potential impacts on ambient pollutant concentrations within the Study Area.

8.6.8 Similarly, as described in **PEIR Volume I Chapter 2: The Scheme**, there would be no normal requirement for Heavy Goods Vehicles (HGV) movements during the operation and maintenance of the Scheme (it is anticipated that any deliveries (including the removal of wastes from site) would be via Light Goods Vehicles (LGV) or cars and would not be frequent) and therefore, no impacts to ecological features due to changes in air quality are anticipated during operation and maintenance of the Scheme due to vehicle emissions – see also **PEIR Volume I Chapter 14: Other Environmental Topics** which has scoped out assessment of the operation and maintenance effects of the Scheme on air quality due to the low level of traffic generated resulting in no significant effects being predicted.

8.6.9 It has been assumed that decommissioning impacts will be similar to those occurring during construction, with retention, where practicable, of important ecological features present at the time of decommissioning and any impacts mitigated fully in line with relevant legislative and policy requirements. It is anticipated that the existing protected species legislation would remain in place, or that any replacement legislation will offer the same level of protection. The mode of decommissioning for the Grid Connection Cables will be dependent upon government policy and good practice at that time. Currently, the most environmentally acceptable option is considered to be leaving the Grid Connection Cables in situ, as this avoids disturbance to overlying land and habitats and to neighbouring communities. Alternatively, the Grid Connection Cables can be removed by opening up the ground at regular intervals and pulling the Grid Connection Cables through to the extraction point, avoiding the need to open up the entire length of the Grid Connection Cables.

8.7 Baseline Conditions

8.7.1 This section describes the existing and future baseline conditions for the ecology assessment.

8.7.2 Further details of the findings of desk and field-based studies, including evaluation of the relative nature conservation value of identified ecological features, will be included within the ES, submitted as part of the DCO application.

Existing Baseline

Sites Statutorily Designated for their Biodiversity Value

8.7.3 There are three sites statutorily designated for their biodiversity value at an International level and within the 10 km Study Area of the Site. These are:

a. Thorne Moor SAC;

b. Thorne and Hatfield Moors SPA; and

c. Hatfield Moor SAC.

8.7.4 There are no SAC sites that list bats as a qualifying feature within 30 km of the Site.

8.7.5 Beyond the 10 km Study Area, the River Went and minor watercourses connected to it are linked to the Humber Estuary SAC/Ramsar approximately 16 km downstream of the Solar PV Site via the River Don and Dutch River. The Humber Estuary SAC/Ramsar is partly designated for two migratory fish species (River Lamprey and Sea Lamprey), which have the potential to be present in the River Went and connected watercourses. Whilst impacts are likely to be avoided, following completion of aquatic surveys in 2024, an assessment on whether the Scheme will have a likely significant effect upon these sites will be considered further in the HRA report that will accompany the DCO application.

8.7.6 There is one site statutorily designated for its biodiversity value at a national level within the 2 km Study Area, this being Shirley Pool SSSI which is located approximately 900 m to the south of the Site Boundary (a section of road to the west of the Solar PV Site). The SSSI is designated for wetland habitats including open water, reed swamp, tall fen, wet neutral grassland, and carr which grades into birch-oak woodland on drier ground. Although unlikely, depending on the nature of the works at this location of the Site, there are potential habitat linkages (i.e. through surface/ground water) that might result in indirect impacts on the habitats associated with Shirley Pool SSSI. These may be through traffic movements during construction or pollution into interlinking watercourses.

8.7.7 Designation details of all statutorily designated sites within the relevant Study Areas are summarised below in Table 8-6 and are presented in ascending order, with those closest to the Site listed first. The locations of these statutorily designated sites, relevant to the Scheme, are presented in **PEIR Volume II Figure 8-1: Statutorily Designated for their Biodiversity Value at an International and National Level**.

Table 8-6: Sites Statutorily Designated for their Biodiversity Value Within 10 km (International) and 2 km (National) of the Site

Statutory Site Name	Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site	Value
Shirley Pool SSSI	The site contains excellent examples of wetland habitats including open water, reed swamp, tall fen, wet neutral grassland and carr which grades into Birch-oak woodland on drier ground. It is the most natural wetland of this type in South Yorkshire. The pools and drains support a representative aquatic flora and as a result it is also of high entomological value, the assemblages of insects associated with sedges and carrland being particularly diverse. A number of species recorded within the SSSI are close to the northern edge of their range in Britain.	approximately900 m south of the Site (a small off-site section of road) and 3.0 km west of the Grid Connection Corridor.	National
Thorne Moor SAC	The Annex I habitat that is a primary reason for selection of this site is degraded raised bogs still capable of natural regeneration.	approximately8.0 km east of the Solar PV Site	International
Thorne and Hatfield Moors SPA	This SPA is designated for breeding Nightjar.	approximately8.5 km east of the Solar PV Site.	International
Hatfield Moor SAC	Similar to Thorne Moors, Hatfield Moors is a remnant of the once-extensive bog and fen peatlands within the Humberhead Levels and is still the second-largest area of extant lowland raised bog peat in England. Moraines of sand occur beneath the peat, the largest of which forms Lindholme Island, in the centre of the bog. Little, if any, original bog surface has survived the massive extraction of peat over the last few decades. Peat-cutting has now ceased, and the bog is being restored over its remaining minimum average depth of 0.5 m of peat.	approximately8.5 km east of the Grid Connection Corridor.	International

Sites Non-Statutorily Designated for their Biodiversity Value

8.7.8 There are 46 non-statutory sites designated for their biodiversity value identified within 2 km of the Site Boundary. These sites have all been designated as LWS or Candidate Local Wildlife Sites (cLWS) for their biodiversity value at a county level and are known to have supporting value to a wide variety of protected or notable species and/or habitats. Whilst cLWS have not yet been designated, they are included within this chapter as they are being considered for designation and may become so within the lifetime of the Scheme.

8.7.9 Non-statutorily designated sites are summarised below in Table 8-7 and are presented in ascending order, with those closest to the Site listed first. The locations of these non-statutorily designated sites, relevant to the Scheme, are presented in **PEIR Volume II Figure 8-2: Sites Non-Statutorily Designated for their Biodiversity Value**.

Table 8-7: Non-Statutorily Designated Sites Within 2 km of the Site

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Went Valley (Part) LWS	This site comprises a series of semi-improved and grazed neutral grasslands which are located immediately south of the River Went.	Within the northern part of the Solar PV Site (adjacent to and south of the River Went).
Wrancarr Drain and Braithwaite Delves LWS	The site comprises two drains. The Ash Carr Drain runs along the western side of a disused railway embankment. There is an overgrown abandoned farm access track that ran north-south along the former route of the railway line, but tall ruderal vegetation is now interspersed by dense scrub in this area. GCN have been recorded here.	A section of this LWS sits within the Grid Connection Corridor.
Trumfleet Pit LWS	A linear wetland site comprising a water filled drain with an east sloping bank with many mature Alders *Alnus glutinosa*, occasional Crack Willow *Salix fragilis* and Pedunculate Oak *Quercus robur*. Skylark *Alauda* arvensis, Gadwall *Anas strepera* and Meadow Pipit *Anthus pratensis* have been recorded at this site.	A section of this LWS sits within the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Trumfleet Pond LWS	This is a small wetland, comprising a small linear pond, with some *Salix* species, surrounded by a horse pasture.	Within the Grid Connection Corridor.
Fox Covert LWS	The site comprises deciduous scrub woodland and a drain. The adjacent land use is silage, arable and wetland. Lesser Spotted Woodpecker *Dendrocopos minor* have been recorded at this site.	This LWS is immediately adjacent to the Grid Connection Corridor.
Marsh Lane LWS	The site comprises a long lane and its hedgerows and some woodland edge, the adjacent land use is woodland and agricultural land. The bridleway of the lane and its edges support an assemblage of plants typical of bare and disturbed ground including Annual Meadow Grass *Poa annua*, Pineapple Mayweed *Matricaria discoidea*, Hawkweeds *Hieracea*, Toad Rush *Juncus bufonius*, Hedge Mustard *Sisymbrium officinale* and Fat Hen *Chenopodium album*.	This LWS is immediately adjacent to the Grid Connection Corridor.
Fenwick Churchyard LWS	This site comprises a small graveyard and contains an area of mildly calcareous to neutral unimproved grassland with scattered planted trees mainly in a line opposite to the site entrance.	Located less than 1 m west of Fenwick Common Lane, which comprises part of the Solar PV Site.
Bunfold Shaw LWS	This small, irregularly shaped site is predominantly Pedunculate Oak dominated woodland in the eastern and central sectors, while the western and south western edge is an open clearing, which supports mainly tall ruderal vegetation, with one or two scattered Oaks and several young, planted Scot's Pine *Pinus sylvestris*. This area of woodland	Located less than 10 m from the Solar PV Site, within the central area of the Solar PV Site.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
	is also listed as 'Ancient and semi-natural woodland'.	
Thorpe in Balne/Kirk Bramwith Area LWS	A large area situated between the River Don and the canal. There are cattle-grazed flood banks alongside the river, which are species poor apart from a small banking. The continuation of Northfield Lane is species-rich in hedgerow terms, with a mix of ground flora. The north west facing canal banking is floristically good in some parts, but lack of cutting/grazing is resulting in dominant grasses taking over.	Approximately 20 m from the Grid Connection Corridor.
Fenwick Hall Moat LWS	The moat edges support some very large mature trees including Ash *Fraxinus excelsior* and White Willow *Salix alba*. The deepest area of standing open water is located at the north eastern corner of the moat where the pond has been deepened in recent years. The wet mud of the moat supports a dense stand of Reed Sweet-grass *Glyceria maxima* with Great Willowherb *Epilobium hirsutum*, Plicate Sweet-grass *Glyceria notata*, Marsh Bedstraw *Galium palustre* and Hard Rush *Juncus inflexus*.	Approximately 25 m from the Solar PV Site, within the central area surrounding Fenwick Hall.
Bentley Tilts and Course of Old Ea Beck LWS	A long linear site, approximately 3.5 km in length. Running along the centre of the site is the straightened and embanked course of the Ea Beck. The site contains two ponds, created by the Environment Agency in the mid-1990 s, and South of the Ea Beck flood bank is a series of waterbodies, ditches and wet borrow pits. The site has historically attracted large	Approximately 35 m west of the Grid Connection Corridor, next to the Existing National Grid Thorpe Marsh Substation.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
	numbers of Snipe *Gallinago gallinago*.	
Warren House Park cLWS	Woodland, hedgerows and wildflower meadow with local wildlife interest including Grass Snake *Natrix 8-52atenate8-52* and birds such as Linnet *Linaria cannabina*, Redwing *Turdus iliacus*, Fieldfare *Turdus pilaris* and Barn Owl.	Approximately 40 m south west of the Site (a small off-site section of road).
Barnby Dun Old Don Oxbow LWS	Site is split into two, with the northern part being used as a fishery and the southern part being used for agriculture and grazing. The site is part of the course of the Old River Don and consists of standing water with a high flood embankment on the south east side.	The closest point of the LWS is approximately 75 m east of the Grid Connection Corridor.
Broad Ings Oxbow LWS	Broad Ings Oxbow is the original line of the River Don and is a treeless site with pasture flood banks grazed by cattle. The area between Broad Ings Oxbow and the straightened River Don is also grazed and has shallow pools after seasonal flooding.	Approximately 90 m east of the Grid Connection Corridor, on the opposite side of the River Don to the Scheme.
Moss Brick Pond LWS	Disused claypit, surrounded by dense scrub. Now used as a fishing lake, the open water area contains locally-abundant Curly Pondweed *Lagarosiphon major*. Both Southern Marsh *Dactylorhiza praetermissa* and Common Spotted Orchid *Dactylorhiza fuchsia* are present.	Approximately 110 m south west of Fenwick Common Lane, which comprises part of the Solar PV Site.
Riddings Farm Pond cLWS	This is a small pond and wetland feature containing small populations of Fine-leaved Water Dropwort *Oenanthe aquatica* (which is locally scarce) and good	Approximately 130 m from the Solar PV Site, within the central area at Riddings Farm.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
	numbers of submerged plant species.	
Pilkington's Burgy Banks LWS	The Burgy Banks have been created over many years by the nearby Pilkington's Glass factory which was located on the opposite side of the River Don and the Dun Navigation. The banks have been created by the gradual settling out of a liquid waste (burgy) which was pumped through a pipe over the river and canal. This process, which began sometime in the 1920's, has resulted in a considerable area of steeply banked 'lagoons', all of which have dried out and solidified.	Approximately 145 m south of the Grid Connection Corridor.
Barnby Dun Borrow Pits LWS	This site is a flooded linear 'borrow pit' created during the building of the flood banks of the adjacent River Don Flood Drain. The water depth ranges from 10 cm at the edges to well over a metre in the centre of the pond. There are two subsites; one is located on the eastern side of the river and the other is on the western side. The high flood banks are semi-improved grassland and are grazed by sheep.	The closest point of the LWS is approximately150 m east of the Grid Connection Corridor.
Old Ings and Chequer Lane LWS	Historic records of Otter and GCN here, this site is large and comprises a series of drains, arable land, improved grassland, woodland, scrub and hedgerows. The adjacent land use is mainly arable.	Approximately 250 m east of the Grid Connection Corridor.
Thorpe Marsh Area LWS	This site comprises Thorpe Marsh Nature Reserve, a reserve of 60 ha managed by the Yorkshire Wildlife Trust. It consists of ancient ridge-and-furrow pastures, a	Approximately 405 m west of the Grid Connection Corridor, next to the Existing National Grid Thorpe Marsh Substation and

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
	disused railway line, ponds and a lake excavated in the late 1970 s.	Bentley Tilts and Course of Old Ea Beck LWS.
Copley Spring Wood LWS	A mixed deciduous woodland bounded by a continuous hedgerow and containing abundant Pedunculate Oak and some Hybrid Oak *Quercus* x *rosacea*.	Approximately 420 m south of the Solar PV Site.
Northfield Pond LWS	A constant wet pond area with typical wet zone trees and ditch running south from the Northfield Pond. Adjacent land use is arable and a canal runs along the north western boundary.	Approximately 450 m east of the Grid Connection Corridor.
Bentley Bank LWS	This site comprises a long linear marsh, grazed grassy floodbank, scrub, ponds and drains. The adjacent land use is arable and the mounds of waste from the Pilkington's Glass Factory (known locally as Burgy Banks). The site is bisected by Arksey Common Lane.	Approximately 465 m south of the Grid Connection Corridor.
Old River Don Oxbow LWS	This site is located on alluvium in the flood plain of the River Don. During the 1930 s the River Don was straightened out near Waite House. All that remains today of the old course is shallow grassy depression which periodically holds water. The site, within the flood banks of the Flood Drain is inundated at times when the river is high. To the south of the old river course is a large pond created by the Environment Agency. To the north and west there is a mixture of arable and pasture. To the east are the River Don Flood Drain and the Dun Navigation.	Approximately 495 m south of the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Croft Ings LWS	This site comprises a series of three 'triangular' borrow pits created to provide material to construct the adjacent canal embankment. A water-filled drain links the ponds. The canal bank rises steeply up from the lower lying agricultural land. This bank is vegetated by tall ruderals, False Oat Grass *Arrhenatherum elatius*, Bramble *Rubus fruticosus* and Common Nettle *Urtica dioica*. Water Vole have been recorded at this site.	Approximately 610 m south east of the Grid Connection Corridor.
Went Valley (near Sykehouse) LWS	This site supports a mosaic of habitats spread over a series of fields. The site is bounded to the north by a small young plantation and the River Went. The southern and eastern boundary is formed by a grassy embankment and established hedge lines.	Approximately 635 m east of the Solar PV Site.
Shirley Pool and Rushy Moor Area LWS	This site contains excellent examples of wetland habitats including open water, reed swamp, tall fen, wet neutral grassland and carr which grades into Birch-oak woodland on drier ground. Shirley Pool SSSI is also located within this site (a smaller extent than the LWS).	Approximately 700 m south of the Site (a small off-site section of road) and 3.0 km west of the Grid Connection Corridor.
Long Sandall Ings LWS	This site is an area of flat, low-lying land situated on alluvium in the flood plain of the River Don, a meander of which formally passed through the area. This was removed when the river was straightened during the first part of the 20 th Century and little trace of it can be found today.	Approximately 820 m south of the Grid Connection Corridor.
Bramwith Lock Woods LWS	This site comprises an extensive area of dense Hawthorn	Approximately 820 m east of the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
	Crataegus monogyna scrub, tall ruderal vegetation and grassland.	
Campsall Country Park LWS	This LWS includes woodland, meadows, ponds and wildflower areas.	Approximately 870 m west of the Site (a small off-site section of road).
Ruskholme LWS	This LWS is located on the east side of the New Junction Canal and on the north bank of the River Don, on the alluvial floodplain. This site is associated with a number of other nearby Local Wildlife Sites and subsites, including: Old Ings, Chequer Lane No. Thorpe in Balne/Kirk Bramwith Area and Bramwith Lock Woods.	Approximately 930 m east of the Grid Connection Corridor.
Bramwith Lane Wood cLWS	This site is a very small, scrappy copse of widely spaced coniferous trees, European Larch *Larix decidua*, Scots Pine and Corsican pine *Pinus nigra*, together with occasional Oak and Sycamore *Acer pseudoplatanus*.	Approximately 970 m south east of the Grid Connection Corridor.
The Grove, Kirk Sandall LWS	This site comprises a narrow section of scattered trees and shrubs running parallel to Moor Lane, which widens out at the western end into secondary broadleaved woodland. Yellowhammer *Emberiza citrinella*, Reed Bunting *Emberiza schoeniclus* and Mistle Thrush *Turdus viscivorus* have been observed here.	Approximately 1.0 km south east of the Grid Connection Corridor.
Kirk Sandall Gorse cLWS	The site formerly had many more open areas; however, the lack of management has allowed tall gorse to spread into most parts of the site. This scrub does, however, provide shelter for birds and the berry-bearing scrub also provides a good source of food in autumn.	Approximately 1.30 km south east of the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Went Valley (Eskholme) LWS	The riverbank supports an abundance of Reed Sweet-grass, Fool's-watercress *Apium nodiflorum*, Amphibious Bistort *Persicaria amphibia*, Reed Canary Grass *Phalaris arundinacea*, Branched Bur-reed *Sparganium erectum*, Greater Bulrush *Typha latifolia* and locally-frequent Pink Water Speedwell *Veronica catenata*.	Approximately 1.44 km north east of the Solar PV Site.
River Went Oxbow cLWS	The old course of the River Went now forms a loop south of the present canalised river. Between one-third to almost a half of this old course is now a dry, or only seasonally wet, depression choked by tall ruderal and scattered wetland vegetation and is shaded throughout much of this western half by dense to scattered scrub and tree cover.	Approximately 1.47 km west of the Solar PV Site.
Barnby Dun Station Wood LWS	This site comprises quite a large area of woodland to the south of the active railway line at Barnby Dun. The canopy is dominated by oak, Silver Birch *Betula pendula* and Downy Birch *Betula pubescens* with an under storey of Elder *Sambucus nigra*, hawthorn and scattered Rowan *Sorbus aucuparia*. A small open glade, beside the railway has areas of bare sand, re-vegetating with Cup Lichen *Cladonia* sp. And mosses *Polytrichum commune*.	Approximately 1.54 km south east of the Grid Connection Corridor.
Joan Croft Pond cLWS	A small wetland site, which has become increasingly surrounded by dense scrub and very widespread and extensive tall ruderal vegetation.	Approximately 1.57 km west of the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Bramwith Hall LWS	This large field supports improved pasture with poor sward structure however the site is of good value being a wooded pasture. Many of the trees are unfenced however some newer planted chestnut species are protected.	Approximately 1.71 km east of the Grid Connection Corridor.
Clay Bridge Field LWS	The site is a small damp meadow enclosed by dense hedgerows on all sides except the south, which has a slightly raised bank along a dry ditch, supporting an old defunct hedgerow comprising a line of mature Pedunculate and Turkey Oaks *Quercus cerris*. A deep water-filled drain runs along the northern side of the site.	Approximately 1.79 km east of the Solar PV Site. New Junction Canal separates the Solar PV Site and the LWS. There is no direct habitat connectivity.
Arksey Ings LWS	No site description provided.	Approximately 1.80 km south west of the Grid Connection Corridor.
Westfield Ings LWS	The site is formerly a marsh within which ponds had been dug and trees planted. The southern part has recently been cleared of scrub and the ponds filled in, but the area still contains marsh plants and could, with suitable management, redevelop as a marsh habitat.	Approximately 1.83 km south east of the Solar PV Site.
Campsmount Park cLWS	Predominantly parkland area.	Approximately 1.84 km west of the Site (a small off-site section of road).
Bradley's Well cLWS	No site description provided.	Approximately 1.86 km north of the Site (a small off-site section of road).
Brecks Plantation cLWS	Plantation woodland.	Approximately 2.0 km south of the Grid Connection Corridor.

Non-Statutory Site Name	Non-Statutory Site Description	Approximate Distance (m/km) and Direction from Closest Point of the Site
Hobbledehoy Wood LWS	Woodland, not ancient woodland.	Approximately 2.0 km south east of the Grid Connection Corridor.

8.7.10 There are two areas of Ancient Woodland within the Study Area of the Site, these being Bunfold Shaw (less than 10 m from the Solar PV Site) and Parkshaw Wood, approximately 1.0 km north west of the Solar PV Site.

Habitats

8.7.11 The land within the Solar PV Site, approximately 420 ha, is predominantly arable agriculture (minimum 60 %), some of which have semi-improved grassland margins and the fields being intersected by a network of drainage ditches, hedgerows and tree-lines. Other habitat includes improved grassland (4.5 ha/approximately1 %), semi-improved grassland (approximately100 ha/24 %), mature trees and hedges (approximately 31 km) and small wooded copses (<1 ha/<1%). The surrounding habitat is mainly arable, with small pockets of mature broad-leaved woodland (plantation and semi-natural). There are individual and clusters of residential properties located adjacent to the Site.

8.7.12 The terrestrial habitats present within the Solar PV Site were identified during the Phase 1 Habitat survey, undertaken in March, April and October 2023. These habitats are the broad habitat types found within the Solar PV Site and are presented in Table 8-8, alongside area calculations that are taken from digitised maps of the Phase 1 Habitats. The locations of these habitats are presented in **PEIR Volume II Figure 8-3: Phase 1 Habitats** and further information is included within **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**.

8.7.13 Surveys within the Site are ongoing and whilst habitats within the Grid Connection Corridor have not yet been defined (therefore are not presented in Table 8-8), a review of aerial imagery (https://www.google.co.uk/maps) indicates that the Grid Connection Corridor lies predominantly within arable fields, crossing the villages of Moss and Thorpe in Balne. The Grid Connection Corridor also appears to cross hedgerows and a small number of ditches. However, where the desk study has identified any HaPI in the Grid Connection Corridor, then these are summarised and included in Table 8-8.

8.7.14 A review of the MAGIC website (Ref. 8-37) identified areas of priority habitats under S41 of the NERC Act 2006 (Ref. 8-9) as being present or likely to be present (where determination by further survey may be required) within the Solar PV Site or within the 50 m Survey Area:

a. Coastal and floodplain grazing marsh (within the Solar PV Site);

a. Rivers (the River Went forms the northern boundary of the Solar PV Site and Fleet Drain is also an Environment Agency (EA) main river and WFD water body);

b. Traditional Orchard (outside of the Solar PV Site, but a hedgerow directly links this habitat to the Solar PV Site); and

c. Reedbeds (outside of the Solar PV Site).

8.7.15 For the EIA that follows with the DCO application, these habitats will be further defined by the detailed habitat surveys, where relevant, set out in Table 8-2. Habitat and condition assessment data will be utilised in the BNG assessment.

Table 8-8: Broad Habitat Types Within the Site and Survey Area Recorded during Surveys or Anticipated to be Present, Alongside Preliminary Assessment of Biodiversity Importance Of Ecological Features

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
A1.1.1 – Broadleaved woodland – semi-natural	Bunfold Shaw LWS is a semi-natural broadleaved woodland located less than 10 m outside the Solar PV Site. As identified on the Ancient Woodland inventory (Ref. 8-38), it is an ancient woodland, dominated by Pedunculate Oak. The woodland also contains Hawthorn, Ash, Silver Birch, overtopping Hazel *Corylus avellana*, Alder, Aspen *Populus tremula* and some scattered conifer species *Pinus* sp. Smaller areas of broadleaved woodland are located within the Solar PV Site, with the largest of these being an apparently unmanaged area of *Salix* carr, approximately 1,700 m^2 in area.	0.2	<0.1	LWS and Habitat of principal importance (HaPI) – Lowland Mixed Deciduous Woodland	Up to County	Bunfold Shaw LWS is of County Importance. It is also an area of Ancient Woodland but is outside of the Site. There are no other areas of Ancient Woodland within the Site. Smaller areas of broadleaved woodland within the Site are HaPI's of lower value.
A1.1.2 - Broadleaved woodland – plantation	Three areas of broadleaved plantation woodland are located within the Solar PV Site, with species recorded including Oak, Sycamore, Whitebeam *Sorbus aria*, Hazel, Willow, Silver Birch,	0.2	<0.1	No	Site	Not a HaPI.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
	Hawthorn and Dog Rose *Rosa canina*.					
A1.3.2 – Mixed woodland – plantation	There are small areas of mixed plantation woodland which contain deciduous and coniferous trees.	0.2	0.1	No	Site	Not a HaPI.
A2.1 – Scrub – dense/continuous	Small areas of scrub are found throughout the Solar PV Site. Hawthorn is dominant, with Dog Rose and Willow species also present	0.3	0.1	No	Site	Not a HaPI.
A3.1 – Broadleaved parkland/scattered trees and A3.3 – Mixed parkland/scattered trees	There are remnants of previous hedges in several locations on the Solar PV Site that have been left unmanaged and as a result now form lines of scattered trees, rather than hedges. They delineate some of the field boundaries.	0.5	0.1	No	Local	Individual trees are not a HaPI. However, veteran or ancient trees are of greater value. Individual trees can provide suitable habitat for protected and notable species, including bats and Barn Owl. The desk study (Ref. 8-39) identified veteran and ancient trees within the Study Area, but not from within the Site.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
B2.2 – Neutral grassland – semi-improved (including B6 – Poor semi-improved grassland)	Approximately 24 % of the Solar PV Site is semi-improved neutral grassland, used for livestock grazing. Some of these areas are dominated by Red Fescue *Festuca rubra*, with abundant Perennial Ryegrass *Lolium perenne*. Other species include Yorkshire Fog *Holcus lanatus*, Cock's-foot *Dactylis glomerata*, Reed Canary Grass and Bent species *Agrostis* sp. Areas with perennial ryegrass and few other species noted within the sward may be re-categorised as B4 Improved grassland following updated surveys in the summer. Some of the grasslands to the northeast of the Solar PV Site have Brassica crop which have spread from the arable fields. These areas are also likely to be subject to some periodic inundation due to the proximity to the River Went and this was supported by the presence of occasional reed and rush	100.9	24	Some of this habitat is within an area shown as Coastal and Floodplain Grazing Marsh HaPI. Potentially other HaPI grassland types may be present. Limestone Grassland, Lowland Heathland and Neutral and Wet Grassland Doncaster BAP habitats (Ref. 8-28).	If priority grasslands are present – Up to County	Some areas are a HaPI. Neutral and wet grassland is also a Doncaster BAP habitat (Ref. 8-28). Further surveys to determine extent and quality of grassland habitats to see if meets the HaPI and Doncaster BAP criteria. If significant area of HaPI/Doncaster BAP habitat then up to County importance.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
	species, potentially of higher value.					
B4 – Improved grassland	Fields in the south east of the Solar PV Site with Perennial Ryegrass dominant.	4.5	1.1	No	Site	Not a HaPI.
C3.1 – Other tall herb and fern – ruderal	There are two areas of tall ruderal vegetation within the Solar PV Site, species including Curled Dock *Rumex crispus*, Common Nettle, Willowherb species *Epilobium* sp. Cleavers *Galium aparine*, Bramble, Hogweed *Heracleum sphondylium* and Dog Rose.	0.6	0.1	No	Site	Not a HaPI.
F1 – Swamp	This habitat, within the northern Solar PV Site (adjacent to the River Went) consists of swards that are dominated by Common Reed with Soft Rush *Juncus effusus*, scattered Pond Sedge *Carex* sp. and Greater Bulrush, representing a reedbed habitat. Some of the swamp habitat is associated with the River Went (Part) LWS, however there are some areas which sit outside of this.	8.2	2.0	Swamp is a HaPI. 'Marshes and Swamps, Lakes and Ponds, Ditches and Drains (MLD)' is listed as a Doncaster BAP habitat (Ref. 8-28).	Up to County	HaPI of County Importance due to presence of LWS and extent of habitat along the River Went riparian corridor.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
	Smaller areas of reedbed within the Solar PV Site are located in and around some of the drainage ditches and the River Went. These areas appear to be regularly inundated (likely after prolonged periods of rain) but dry out regularly.					
G2 – Running water	The River Went runs along the northern boundary of the Solar PV Site, flowing from west to east. The river channel is approximately 7 m wide and the banks are less than 1 m high and vegetated with Common Nettle and Common Reed *Phragmites australis*. The Fleet Drain and Fenwick Common Drain are two watercourses that run through the Solar PV Site and are connected to (fed by) the network of field drains. The Fleet Drain is connected to the River Went, and to Fenwick Common Drain. Banks are steep, and approximately 2 to 3 m high, and 2 to 3 m wide. Flora adjacent to the drains includes	0.9	0.2	Importance due to presence of the LWS designation and connectivity to the Humber Estuary SAC.	Up to County	Rivers may qualify as a HaPI.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
	Common Nettle, Lesser Celandine *Ficaria verna* and Cow Parsley *Anthriscus sylvestris*.					
J1.1 – Cultivated/disturbed land – arable	Over 60 % of the Solar PV Site is cultivated and used for the production of arable crops, including Brassica sp. and wheat. Arable margins are adjacent to the fields in the north, with flora recorded here including Shepherd's Purse *Capsella bursa-pastoris*, Red Dead Nettle *Lamium purpureum*, Yarrow *Achillea millefolium*, Colt's Foot *Tussilago farfara*, Common Chickweed *Stellaria media*, Speedwell species *Veronica* sp. and Bittercress species *Cardamine* sp. Potential for rare/scarce arable plants.	292.5	69.7	Arable margins are a HaPI and Doncaster BAP habitat (Ref. 8-28).	Up to County	Intensively managed arable farmland is not a HaPI but some arable fields have field margins which could support notable flora (to be confirmed through an arable flora survey) and arable margins are a HaPI.
J1.2 – Cultivated/disturbed land – amenity grassland	This refers to open areas, used for amenity (such as parklands or gardens) and are typically intensively managed with very few plant species.	0.2	0.1	None	Site	Not a HaPI.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
J1.3 – Cultivated/disturbed land – ephemeral/short perennial	These comprise areas of disturbed ground/set-aside within arable fields in the southern part of the Solar PV Site with no signs of recent cultivation. Species present here include Common Nettle, Umbellifer species *Daucus* sp. Mayweed species and Cleavers.	5.9	1.4	None	Site	Not a HaPI.
J2.6 – Dry ditch	Drainage ditches are associated with every hedgerow, scattered tree line and field edge at the Solar PV Site. Although the majority of each ditch were dry, every ditch contained some water at the time of survey. The water present is likely to be as a result of prior rainfall as the majority of ditches lacked any flora that is typical of periodic or permanent inundation, with only some localised stands of common reed indicating more regular inundation.	0.2	0.0	No, however, may support notable aquatic species due to connectivity with other watercourses, including designated sites. Ditches and drains are a Doncaster BAP habitat (Ref. 8-28).	Site	Not a HaPI. However, ditches and drains which hold water for most of the year are a Doncaster BAP habitat.
J3.6 – Buildings	A single agricultural building is present within the Solar PV Site.	0.1	0.0	None	Site	Not a HaPI.

Habitat	Summary Description	Area (hectares)	% of Site Area	Conservation Status	Preliminary Importance	Supporting notes
J4 – Bare ground	A small area mainly along tracks/paths	0.3	0.1	None	Site	Not a HaPI.
J5 – Other habitat	Other habitat target noted during the PEA survey, generally not surveyed due to no access therefore no habitat assigned.	0.8	0.2	None	Site	Survey update will define these habitats (where accessible).
Z99 – Hardstanding	Hardstanding around buildings and roads.	2.7	0.6	None	Site	Not a HaPI.
Species-poor and species-rich hedgerows (intact and defunct), some with trees.	There are approximately 110 hedgerows within the Solar PV Site, with native species, Hawthorn or Blackthorn *Prunus spinosa*, dominating and most have some evidence of current management. A few of the hedges present appear more diverse than others; supporting a number of woody species, including Blackthorn, Ash, Dog Rose and Oak standards. Hedgerows are also present within the Grid Connection Corridor.	Approximately 31 km	-	All hedges are a HaPI. Ancient and species-rich hedgerows are a Doncaster BAP habitat (Ref. 8-28). Some of the hedgerows may be classified as 'Important' under the Hedgerow Regulations (Ref. 8-11), to be confirmed by further surveys in 2024.	Up to County	HaPI, legally protected under the Hedgerow Regulations (Ref. 8-11). Hedgerows are listed as a Doncaster BAP habitat (Ref. 8-28).

Protected and Notable Species and INNS

8.7.16 The desk study obtained data from DLRC of protected and notable species within the 2 km Study Area and from the preceding ten years. These protected and notable species, including species of conservation importance, are summarised in this PEIR and can be reviewed in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**.

8.7.17 Table 8-9 presents a summary of protected, notable and INNS animal and plant species that have been identified (up to January 2024) during the desk study and completed ecological surveys (undertaken between February 2023 and January 2024) as present, or potentially present, within the Site and relevant Survey Areas (see Table 8-2) alongside a preliminary assessment of each feature's importance/value (sensitivity).

8.7.18 The preliminary assessment of biodiversity importance of ecological features has been made where surveys have been undertaken and completed as of January 2024. This assessment will be further updated by ongoing surveys throughout the relevant survey windows in 2024. Where the biodiversity importance of a feature is specific to a particular area of the Site (e.g. occurring within the Solar PV Site only), then this is specified with population size or specific species in Table 8-9.

Table 8-9: Summary of Baseline Details for Legally Protected, Notable and Invasive Non-Native Species Alongside Preliminary Assessment of Biodiversity Importance of Ecological Features

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
Aquatic macro-invertebrates (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: There are no recent records of notable or protected aquatic macroinvertebrates, including White-clawed Crayfish *Austropotamobius pallipes* within the Study Area. Although protected and notable aquatic invertebrate records were absent from the Study Area, it should be noted that for the River Went from Blowell Drain to the River Don WFD Water Body (ID: GB104027064260), aquatic invertebrates were classified as High status for the 2019 WFD cycle (Ref. 8-71). There are no Environment Agency monitoring sites on Fleet Drain and Fenwick Common Drain. Therefore, desk study data was taken from an Environment Agency monitoring site (EA Site ID: 916) on the River Went, 2 km upstream from the Site and 4.7 km upstream of the confluence of Fleet Drain with the River Went. **Field Survey**: Aquatic macroinvertebrate surveys will be completed in	Desk study records indicate that the River Went may be of importance to aquatic macroinvertebrates. Whilst there is potential for notable macroinvertebrates to be present within the Site, IEF's will be confirmed (TBC), following surveys in 2024.	Likely importance of Local, based on desk study data, to be confirmed when surveys are completed between PEIR and ES.	No recent records of notable or protected aquatic macroinvertebrates species were identified during the desk study and surveys will be completed in 2024, during the appropriate seasons. Regardless, a preliminary assessment of the potential impacts to aquatic macroinvertebrates is included in Table 8-12, in consideration of embedded mitigation measures included in Section 8.10.

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	spring/summer/autumn 2024. To date, a targeted approach to survey has been undertaken to assess a representative number of ditches and watercourses with the potential to be affected by the Scheme. Following aquatic walkover surveys, eleven ditches have been assessed to date, of which six were recorded as wet and five were dry. Wet ditches were generally found to be showing little sign of physical damage and visible INNS were absent. However, heavy shading was present, marginal vegetation was lacking along many and there was a lack of diversity in aquatic plants.			
Aquatic macrophytes (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: There were no Environment Agency monitoring sites within 2 km of the Site. However, one monitoring site (EA Site ID: 326) was located on the River Went, approximately 2.75 km downstream of the Site. According to this data, there are no recent records of protected aquatic macrophytes. According to Environment Agency catchment database data, macrophytes as a sub-element scored poorly on the Went from Blowell Drain to the River	Desk study records indicate that there are no notable or protected aquatic macrophytes within the Study Area. The potential for notable macrophytes and INNS to be present within the Site will be confirmed	Likely importance of Local, based on desk study data, to be confirmed when surveys are completed between PEIR and ES.	No recent records of notable or protected aquatic macrophytes species were identified during the desk study and surveys will be completed in 2024, during the appropriate seasons. Regardless, a preliminary assessment of the potential impacts to aquatic macrophytes is included in Table 8-12, in consideration

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	Don Water Body during the 2019 and 2022 cycle. Furthermore, there were no records of protected macrophyte species listed in the Species Audit of Doncaster Borough in support of the Doncaster BAP (Ref. 8-28). **Field Survey**: Aquatic macrophyte surveys will be completed in 2024.	following surveys in 2024.		of embedded mitigation measures included in Section 8.10.
Fish (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: Environment Agency data within 2 km of Fleet drain and Common drain were not available. Therefore, NBN Atlas data (Ref. 8-40) from an Environment Agency monitoring site (EA Site ID: 4355) approximately 2 km upstream of the Site on the River Went were used. Two notable fish species were identified in 2012, 2017 and 2019, these being European Bullhead *Cottus gobio* and European Eel *Anguilla anguilla*. Furthermore, additional fish species recorded there included seven records of Three-spined Stickleback *Gasterosteus aculeatus*, with the most recent record being in 2017. According to Environment Agency data, fish are classified as Poor status within the Went	European Eel potentially present in all water bodies within the Site, due to their connectivity. European Bullhead, Brown/Sea Trout. Potential for Lamprey sp. to be present due to connectivity to Humber Estuary SAC.	Likely importance of County, based on desk study data.	Desk study data has identified the potential for European Eel, protected under the Eels (England and Wales) Regulations (Ref. 8-15), to be present. Furthermore, European Bullhead is an Annex II (Ref. 8-2) and UK BAP species (Ref. 8-26), however it is common and widespread. Brown Trout is a SPI. River Lamprey and Sea Lamprey (Annex II) are a primary reason for selection

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	from Blowell Drain to the River Don WFD Water Body. The Species Audit of the City of Doncaster Council, produced for the Doncaster BAP in 2007 (Ref. 8-28), also listed twenty-two records of European Eel, six records of Atlantic Salmon *Salmo salar*, four records of Brown Trout *Salmo trutta* located at various unconfirmed locations, and one record of Sea Lamprey within the New Junction Canal which is connected to the River Went approximately 6 km downstream of the Study Area. **Field Survey**: Fish surveys will be completed in 2024 on watercourses where HDD is not taking place. .			of the Humber Estuary SAC. A preliminary assessment of the potential impacts to fish is presented in Table 8 13, in consideration of embedded mitigation measures included in Section 8.10.
Terrestrial invertebrates (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary**	**Desk Study**: The desk study returned over 750 records of notable terrestrial invertebrates from within the Study Area, mainly butterflies (334 records), moths (83 records), beetles (29 records), dragonflies (310 records) and orthoptera (one record). **Field Survey**: Semi-natural grassland areas may support notable species or assemblages of terrestrial invertebrates, which will be confirmed by surveys.	–Based on Phase 1 habitat data, there are areas of potentially more value to terrestrial invertebrate species and assemblages within the Solar PV Site and this will be confirmed following	Likely importance of Local, based on desk study data and grassland habitats within the Solar PV Site.	Based on the potential for assemblages of notable terrestrial invertebrates within higher value grassland habitats (i.e. HaPI) within the Solar PV Site. Boundary habitats (i.e. hedgerows and trees) of higher value to terrestrial

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
Ecological Appraisal)		additional survey in 2024.		invertebrates likely to be avoided. A preliminary assessment of the potential impacts to terrestrial invertebrates is presented in Table 8 13, in consideration of embedded mitigation measures included in Section 8.10.
GCN (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study:** The data search returned records of GCN from within the Study Area. **Field Survey**: There are no ponds within the Site, however, four watercourses were sampled for GCN eDNA in spring 2023 within the Solar PV Site, with all four returning positive results.	Population of GCN, based on desk study records of presence within the Study Area (outside of the Site) and eDNA survey of four watercourses in the Solar PV Site.	Likely importance of Local, based on desk study data and surveys undertaken to date	The Scheme has the potential to result in the loss of suitable terrestrial habitat for GCN (albeit mostly temporarily), therefore the DLL approach is being explored through consultation with Natural England. If required, further surveys will be undertaken as presented in **Table 8-2** and Natural England's risk modelling will be used to identify whether the Scheme is likely to have a significant effect on this

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
				species, should the DLL route be pursued. As part of the DLL process Natural England would undertake an impact assessment, the outcome of which would be documented in an Impact Assessment and Conservation Payment Certificate. This document would also provide additional detail to inform the findings in the ES, including information on the Scheme's impact on GCN and the appropriate compensation required
Reptiles (see **PEIR Volume III Appendix 8-3: Reptile Survey Report**)	**Desk Study**: The data search returned records of Grass Snake occurring within the Study Area. **Field Survey**: Low population of Grass Snake recorded in September 2023 from the three survey areas within the Solar PV Site, with a	Grass Snake	Local	Reptiles are protected from intentional injuring or killing under the WCA (Ref. 8-1) and are SPI under S41 of the NERC Act (2006) (Ref. 8-9). Grass Snake is also included in the species Audit of the City of

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	peak of 9 animals on a single date, which included a single juvenile.			Doncaster Council, produced for the Doncaster BAP (Ref. 8-28). However, only a low population of a single species; Grass Snake (a common and widespread species) is present within the Solar PV Site.
Birds (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: The desk study identified records of over 70 species of bird, including specially protected species (such as Barn Owl) and notable bird species (such as Yellowhammer) **Field Survey**: Surveys of breeding birds undertaken to date (to be completed in 2024), recorded 57 birds using the Solar PV Site and a breeding assemblage of 47 species, including notable species such as Skylark and Yellowhammer. Curlew was recorded on the Solar PV Site in April 2023, but no subsequent evidence of breeding on the Site was identified. The species is likely to be present within the wider landscape of the Site.	Common nesting bird species and an assemblage of notable birds (general breeding bird assemblage) breeding within the Site.	Likely importance of Local - to be confirmed when surveys complete.	All nesting birds are protected under the WCA (Ref. 8-1). Habitat within the Site supports nesting birds. The Solar PV Site supports notable species during the breeding season.
		Single breeding territory of Barn Owl within the Solar PV Site	Likely importance of Local - to be confirmed when surveys complete.	Specially protected species, owing to its inclusion on Schedule 1 of the WCA, but one territory does not constitute 1 % of the national or county population for this species.

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	Surveys of non-breeding birds are ongoing, but as of January 2024, the assemblage of non-breeding birds recorded within the Solar PV Site, includes SPI (Ref. 8-9) (such as Skylark) and low numbers of Annex 1 species (Ref. 8-2), such as Golden Plover *Pluvialis apricaria*.	Assemblage of non-breeding birds	Likely importance of Local - to be confirmed when surveys complete.	SPI and Birds of Conservation Concern (BoCC) Red list species recorded, but currently do not constitute 1 % of the national or county population for any species.
Bats – roosts (see **PEIR Volume III Appendix 8-4: Bat Survey Report**)	**Desk Study**: The desk study identified sixteen records of bats within the Study Area in the last ten years, including two roosts. Species comprise Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Pipistrelle species *Pipistrellus* sp. a Brown Long-eared bat *Plecotus auritus* and Noctule *Nyctalus noctula*. No roost records are from within the Site and the closest records are 1.2 km east of the Site, in 2015. A review of MAGIC (Ref. 8-37) identified three Natural England licences were granted within the Study Area, the closest of which covered destruction of a resting place for Common Pipistrelle and Soprano Pipistrelle. **Field Survey**: As of December 2023, the daytime bat walkover has identified numerous trees within the Solar PV Site as having bat	Potential for roosts of widespread, rarer or species with restricted distribution within and adjacent to the Site.	Up to County – to be confirmed for each species of bat when surveys complete.	All bat species and their roosts are legally protected in the UK under the WCA, 1981 (as amended) (Ref. 8-1) and Habitats and Species Regulations (Ref. 8-7), which implement the EC Directive 92/43/EEC (Ref. 8-2). Seven bat species are also included as Priority Species under S41 of the NERC Act (Ref. 8-9). The Site is unlikely to support significant roost sites, for example maternity or hibernation roosts for rarer species due to the lack of habitats such as buildings and underground sites and

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
	roost suitability. Some areas at the time could not be assessed due to access (detailed assessments will be undertaken in 2023, where required). These trees mostly form tree lines/hedgerows along field boundaries.			geographical location. Bat emergence surveys and/or aerial climb and inspect surveys will be completed where trees with moderate or high suitability for roosting bats will be directly affected by the Scheme, or where the potential for disturbance (above existing levels) is identified. Theis data will inform the ES and mitigation strategy. However, it is anticipated that the vast majority of mature trees will be retained and protected and disturbance can be mitigated.
Bats – commuting and foraging habitat (see **PEIR Volume III Appendix 8-4: Bat**	**Desk Study**: The desk study returned seven bat records within the 2 km Study Area (dated within the last ten years, up to 2022), none of these are within the Site. These included one pipistrelle species, one Common Pipistrelle record, three Soprano Pipistrelle records and two Brown Long-eared bat. The closest record	Foraging/commuting activity of widespread and rarer bat species within and adjacent to the Site.	County – to be confirmed when surveys complete	All bat species and their roosts are legally protected in the UK under the WCA, 1981 (as amended) (Ref. 8-1) and Conservation of Habitats and Species Regulations (as amended)

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
Survey Report)	is approximately 1.7 km north west from the Site. **Field Survey**: Species recorded during 2023 bat surveys included Common Pipistrelle, Soprano Pipistrelle, Pipistrelle species, Brown Long-eared bat, Noctule, Daubenton's bat *Myotis daubentonii* and *Myotis* species (Daubenton's and/or other unknown *Myotis* species).			(Ref. 8-7), which implement the EC Directive 92/43/EEC (Ref. 8-2). Seven bat species are also included as Priority Species under Section 41 of the NERC Act (Ref. 8-9). The biodiversity importance of commuting and foraging habitat for bats is based on species rarity, habitat types/features habitat reliance and roost types. The bat activity survey data collated during the ongoing surveys will inform the ES and mitigation strategy.
Riparian mammals (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary**	**Desk Study**: The data search returned records of Water Vole occurring within the Study Area, but none identified from within the Site. No recent (i.e. within the preceding ten years) records of Otter were returned. **Field Survey**: The River Went, ponds and the ditches associated within and surrounding the Site were assessed as having the potential to support water voles. Evidence of Otter was	Presence of Otter within the River Went.	Likely importance of Local – to be confirmed when surveys complete.	Otter is protected under Habitats and Species Regulations (Ref. 8-7) and Schedule 5 of the WCA (Ref. 8-1). Water Vole and Otter are also included in the species Audit of the City of Doncaster Council,

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
Ecological Appraisal)	recorded on the River Went. Further surveys will be used to determine presence of resting/breeding dens of Otter and presence/absence of Water Vole.			produced for the Doncaster BAP (Ref. 8-28). Otters have an estimated British population of 11,000, are increasing in population size and range (Ref. 8-72) and are of International Union for the Conservation of Nature (IUCN) Least Concern status in England (Ref. 8-73). Limited levels of Otter activity noted.
Badger (see **PEIR Volume III Appendix 8-5: Badger Report (Confidential)**)	**Desk Study**: The data search did not return any recent records of Badger within the Study Area and within the preceding ten years. **Field Survey**: The Solar PV Site supports areas of woodland, grassland, scrub, hedgerows, and ponds which provide suitable commuting, foraging and watering habitat for Badger and evidence of this species was recorded within the Solar PV Site.	Presence of this species within the Site.	Local	Protected under The Protection of Badgers Act 1992 (Ref. 8-10) and also included in the species Audit of the City of Doncaster Council, produced for the Doncaster BAP (Ref. 8-28). However, they remain common and widespread.

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
Brown Hare (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: The data search returned records of Brown Hare within the Study Area and occurring within the preceding ten years. **Field Survey**: This species has been recorded within the Solar PV Site during ecological surveys and is therefore assumed to occur within the Grid Connection Corridor.	Presence of this species confirmed within the Site.	Local	SPI in England (Ref. 8-9) and also included in the species Audit of the City of Doncaster Council, produced for the Doncaster BAP (Ref. 8-28). Brown Hare was recorded in arable land within the Solar PV Site during ecological surveys undertaken in 2023.
Hedgehog (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: The data search returned records of Hedgehog within the Study Area and occurring within the preceding ten years. **Field Survey**: This species has not been recorded within the Site during ecological surveys, although hedgerows, woodland and scrub habitat could support this species.	Assumed presence within the Site	Local	SPI in England (Ref. 8-9). Not recorded during ecological surveys, but based on scrub, woodland and hedgerow habitats within the Site, geographical range of this species, alongside presumed abundance within the county, an assumption has been made this species is likely to be present within the Site.
Other mammals,	**Desk Study**: The data search returned records of Harvest Mouse within the Study	Assumed presence within the Site	Local	Harvest Mouse is a SPI (Ref. 8-9) and is also

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes
listed on S41 of the NERC Act (such as Polecat, Harvest Mouse) (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	Area and occurring within the preceding ten years. There were no records of Polecat or other S41 species identified within the Study Area and within the last ten years. **Field Survey**: The habitat within the Site contains arable farmland, ditches, hedgerows and woodland. Therefore, this habitat is assumed to support Harvest Mouse.			included in the species Audit of the City of Doncaster Council, produced for the Doncaster BAP (Ref. 8-28). The Site does offer suitable habitat for this species, which can be found in tall grassland, farmland and hedgerows.
INNS (desk study results included in **PEIR Volume III Appendix 8-2: Preliminary Ecological Appraisal**)	**Desk Study**: Several aquatic non-native species were identified as occurring within the Study Area during the desk study, including the New Zealand Mud Snail *Potamopyrgus antipodarum*, Nuttall's Waterweed *Elodea nuttallii* and Curly Waterweed *Lagarosiphon major*. **Field Surveys**: Terrestrial and aquatic INNS will be recorded during ongoing ecological surveys.	Not applicable	Not applicable	Mitigation including biosecurity measures will need to be implemented during construction in areas where these species are present to prevent their spread, which would constitute an offence under the associated legislation (e.g. for INNS plants Curly Waterweed and Nuttall's Waterweed).

Ecological Feature and Technical Appendix	Baseline Detail	IEFs	Preliminary Assessment of Biodiversity Importance	Supporting Notes

8.8 Summary of Important Ecological Features

8.8.1 Table 8-10 summarises the known IEFs that are relevant to the Scheme, based on desk study and survey data collected between February 2023 and January 2024. Based on CIEEM guidelines (Ref. 8-32) and using professional judgement, features of Site importance i.e. less than Local importance, are not considered further in the assessment process, unless legislation requires their consideration. Therefore, in recognition of the protected status of species occurring at a local level (e.g. Badger), the Scheme will embed appropriate mitigation (see Section 8.10 of this PEIR) to minimise or avoid impacts in line with the relevant legislation.

8.8.2 The identification of further IEFs will be determined by the ongoing field surveys during 2024 and updated baseline information will be presented in the ES, submitted as part of the DCO application.

Table 8-10: Summary of known Important Ecological Features

IEFs	Geographic importance	Reason for valuation of IEFs
Thorne Moor SAC	International	Statutory site of nature conservation value at an international level and therefore qualifies as **Very High** Importance.
Thorne and Hatfield Moors SPA	International	Statutory site of nature conservation value at an international level and therefore qualifies as **Very High** Importance.
Hatfield Moor SAC	International	Statutory site of nature conservation value at an international level and therefore qualifies as **Very High** Importance.
Shirley Pool SSSI	National	Statutory site of nature conservation value and therefore qualifies as **High** Importance.
46 sites of county importance (LWSs or cLWSs – see Table 8-7)	County	Non-statutory sites designated for biodiversity

IEFs	Geographic importance	Reason for valuation of IEFs
		importance, qualifying as **Medium** Importance.
Habitat – broad-leaved woodland (semi-natural), including Ancient Woodland	Up to County	Habitat of ecological importance, supporting a wide range of fauna and included as a HaPI. Therefore, this habitat qualifies as being of up to **Medium** Importance.
Habitat – veteran/ancient trees	Local	Ancient and veteran trees are notable for their potential biodiversity value. Therefore, this habitat qualifies as being of **Low** Importance.
Habitat – Neutral grassland - semi-improved (including B6 - poor semi-improved grassland)	Up to County	Coastal and Floodplain Grazing Marsh is as a habitat of ecological importance included as a HaPI. At this stage, pending further survey, this habitat qualifies as being of up to **Medium** Importance.
Habitat - swamp	Up to County	HaPI and Doncaster BAP habitat. Therefore, this habitat qualifies as being of **Medium** Importance.
Habitat – Running water	Up to County	Connectivity to statutory site of nature conservation value and therefore qualifies as **Medium** Importance.
Habitat – arable margins	Up to County	At this stage, pending further surveys this

IEFs	Geographic importance	Reason for valuation of IEFs
		habitat has been assessed as being of up to **Medium** Importance.
Habitat - hedgerows	Up to County	The network of hedgerows across the Site will be of value to birds, bats and other fauna, therefore hedgerows qualify as being of **Medium** Importance.
Aquatic macroinvertebrates	Likely importance of Local	At this stage, pending further surveys this feature has been assessed as being of **Low** Importance.
Aquatic macrophytes	Likely importance of Local	At this stage, pending further surveys this feature has been assessed as being of **Low** Importance.
Fish	Likely importance of County	At this stage, pending further surveys this feature has been assessed as being of **Medium** Importance.
Terrestrial invertebrates	Likely importance of Local	At this stage, pending further surveys this feature has been assessed as being of **Low** Importance.
GCN	Likely importance of Local	At this stage, pending further surveys this feature has been assessed as being of **Low** Importance.
Reptiles – Grass Snake	Local	Presence of an estimated low population of one reptile species within the Solar PV Site. Therefore, qualifies

IEFs	Geographic importance	Reason for valuation of IEFs
		as being of **Low** Importance.
Breeding Birds (General breeding bird assemblage)	Likely importance of Local	Populations of common and notable breeding bird species, of Local importance, and therefore qualifies as being of **Low** Importance.
Breeding birds – territories of specially protected species within the Solar PV Site.	Likely importance of Local	Small population of Barn Owl, a species included on Schedule 1 of the WCA (Ref. 8-1) within the Solar PV Site and qualifies as being of **Low** Importance.
Non-breeding birds	Likely importance of Local	At this stage, pending further surveys this feature has been assessed as being of **Low** Importance.
Bats – roosts	Up to County	Potential for bat roosts within and close to the Site, including those identified in the desk and possible other rarer species would qualify as being of **Low** to **Medium** Importance (depending on the species).
Bats – commuting/foraging habitat	Up to County	The biodiversity importance of commuting and foraging habitat for bats is based on species rarity, habitat types/features habitat reliance and roost types. Based on this assessment the

IEFs	Geographic importance	Reason for valuation of IEFs
		commuting/foraging habitat would qualify as being of **Medium** Importance.
Riparian Mammals (Otter)	Likely importance of Local	Presence of Otter on the River Went and lack of breeding dens (pending further survey) would qualify as being of **Low** Importance.
Badger	Local	Badgers occurring within the Site are of **Low** importance.
Other mammals (Brown Hare, Hedgehog and Harvest Mouse)	Local	Presence of Brown Hare confirmed within the Solar PV Site and presence likely across the Site for Hedgehog and Harvest Mouse, with all species qualifying as being of **Low** Importance.
INNS	Not applicable	There are statutory constraints regarding the potential spread of INNS, as presented in **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**.

Future Baseline

8.8.3 The future baseline (i.e. no development) scenarios are set out in **PEIR Volume I Chapter 5: Environmental Impact Assessment Methodology**. However, this section considers those changes to the ecological baseline conditions, described above, that might occur in the absence of the Scheme and during the time period over which the Scheme would be in place.

No Development

8.8.4 In the short to medium term, in the absence of the Scheme, habitats within the Site (such as arable fields (cropped on rotation), grazed grassland,

mature trees, hedgerows, ponds and woodland) have and will continue to provide a number of species with potential habitat for foraging and reproduction, such as agricultural fields for ground-nesting breeding birds. In the long term, in the absence of the Scheme, habitats within the Solar PV Site will be under agricultural management and therefore the low biodiversity of this landscape and the damaged soil, poor water quality and artificially low water tables will remain, making recovery of these ecosystems harder to achieve. The distribution of some species will change in response to changes in crop type/livestock management, whilst the species assemblages are likely to remain broadly the same. Any changes to the baseline between now and the future scenario have been taken into account in this preliminary assessment and when determining likely mitigation measures.

8.8.5 Irrespective of whether the Scheme were to proceed or not, the current national, regional and local trend is for an overall decline in species diversity and abundance e.g. farmland birds. These declines are likely to continue in the landscape surrounding the Scheme throughout its duration.

Construction Period (Assumed to be 2028-2030)

8.8.6 Based on current trends, in the absence of the Scheme, species abundance and diversity are likely to remain similar to the existing baseline conditions during the construction period, although the trajectory for the majority of species is continued decline.

8.8.7 If the Scheme did not proceed, the majority of existing habitats are likely to continue being present, although some changes in habitat extent, composition and structure will occur as a result of ecological succession e.g. the gradual establishment of tree and shrub seedlings within woodland areas and along hedgerows. These resultant gradual changes in habitat composition are unlikely to materially alter the ecological baseline and therefore the habitats and species present are very unlikely to undergo significant change prior to 2028.

Operation and Maintenance (Assumed to be 2030-2070)

8.8.8 Based on current projections, the long-term i.e. the next 40 years, will see extreme weather conditions due to climate change (see **PEIR Volume I Chapter 6: Climate Change**) to which the agricultural landscape has low resilience. For example, heavy and prolonged rainfall would exacerbate loss of soil and sedimentation of ditches, drains and rivers. There would be a continued decline in biodiversity, including species associated with the baseline conditions present within the Site.

8.8.9 National and local planning policy targeted at halting and reversing these declines is presented in **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**.

8.8.10 If the Scheme did not progress, based on available information, whilst there is likely to be an overall decline in biodiversity, there are no reasons to expect that there would be any marked change in the broad habitat types within the Site between opening in 2030 and decommissioning in 2070 (based on an estimated 40-year operation). Habitats such as broad-leaved trees and scrub will be more mature but are likely to support a broadly

similar species assemblage and arable farmland will also be managed accordingly, maintaining broadly similar species assemblages.

Decommissioning (Assumed to be from 2070)

8.8.11 The future baseline conditions in 2070 are currently unknown and more difficult to predict given the time period that would need to lapse between now and then. Habitats such as plantation woodland would have matured, though some may have been felled or partially cropped. Species assemblages are also likely to have changed in accordance with the site conditions, with changes in biodiversity likely to occur if climate change continues at its current pace. Effects could include changes in species habitats and compositions and consequently changes in species assemblages and distribution.

8.9 Potential Impacts

8.9.1 Prior to the implementation of any mitigation, the Scheme has the potential to affect biodiversity (positively or negatively) during construction, operation and maintenance, and decommissioning in the following ways:

Construction (Assumed to be 2028-2030)

8.9.2 Impacts on biodiversity features during construction of the Scheme are likely to include:

a. Habitat loss or gain – direct impacts associated with changes in land use resulting from the Scheme, for example temporary works associated with site clearance, and permanent land-take (mainly arable land) associated with the installation of the Scheme;

b. Fragmentation of populations or habitats – indirect impacts due to the Scheme dividing a habitat, group of related habitats, site or ecological network, or the creation of partial or complete barriers (e.g. culverts) to the movement of species, with a consequent impairment of ecological function;

c. Disturbance – indirect impacts resulting from a change in normal conditions (e.g. light, noise, vibration and human activity) that result in individuals or populations of species changing behaviour or range;

d. Habitat degradation – direct or indirect impacts resulting in the reduction in the condition of a habitat and its suitability for some or all of the species it supports, for example changes in chemical water quality, increased sedimentation and dust deposition, or changes in surface flow or groundwater;

e. Species mortality – direct impacts on species populations associated with mortalities due to construction activities, for example site clearance; and

f. Introduction and, or, spread of invasive species, due to the movement of personnel, equipment and plant machinery, potentially facilitating the introduction of invasive species.

Operation and Maintenance (Assumed to be 2030-2070)

8.9.3 Impacts on biodiversity features during operation and maintenance of the Scheme are likely to include:

Negative impacts:

a. Potential avoidance of species using the Site, such as bats and birds, due to indirect impacts through operational lighting;

b. Disturbance of sensitive species during operation and maintenance activities;

c. Fragmentation of habitats causing a barrier effect e.g. due to fencing;

d. Disturbance and displacement of aquatic fauna, especially fish, from Electromagnetic Fields (EMF); and

e. Potential displacement of bats due to the presence of Solar PV Panels.

8.9.4 There is limited scientific literature available on the impacts to bats from operational solar farms (Ref. 8-77, Ref. 8-78, Ref. 8-79), although a couple of recent papers (Ref. 8-81, Ref. 8-82) from small operational sites (in south west England and France) have suggested that bats avoided fields with solar panels and that bat activity was reduced by almost half at the boundaries of fields with solar panels compared to control sites. The reasons for these reductions in activity were not fully determined, but it is worth noting that no pre-construction surveys were undertaken to characterise the baseline, so limited information was presented on pre-construction bat populations or how bats used the site prior to panels being present. In addition, these smaller sites did not have any significant new tree/hedge planting, and/or grassland creation and therefore, are unlikely to be comparable to this Scheme (and other large-scale DCO schemes) where significant areas of habitat enhancement are provided. All the small solar PV sites in the studies were on grassland that was either grazed or managed through mowing or were on cut arable crops and therefore the avoidance behaviour observed by bats is likely to be different at this Scheme where the embedded mitigation and proposed habitat enhancement will include large areas of habitat buffers, pond restoration and new tree and hedge planting.

8.9.5

Beneficial impacts:

a. Increases in permanent habitat of greater floristic diversity than arable farmland, increasing invertebrate assemblages and abundance;

b. Increased connectivity through planting of trees and hedgerows;

c. Undeveloped fields and margins providing enhanced nesting and foraging habitats for farmland birds, small mammals, amphibians and reptiles;

d. Potential attraction and increases in species foraging around the Site, such as bats and birds, from increases in prey items (i.e. flying insects);

e. Potential increases in abundance and distribution of species, due to lack of human disturbance and changes in habitat (such as agricultural practices) within the Site; and

f. Indirect beneficial impacts through a possible reduction of agricultural chemical inputs to watercourses/reduction in pesticide use on crops within the local area resulting in an increase in invertebrate abundance and diversity.

Decommissioning (from 2070)

8.9.6 Impacts on ecological features during decommissioning of the Scheme are likely to be similar to those during the construction phase. Field surveys would be required in advance of decommissioning to define the ecological baseline at the time of decommissioning and to ensure that impacts on ecological features are identified, avoided and/or mitigated. Upon decommissioning, the above-ground physical infrastructure will be removed and the Site returned to landowners in the condition as at the end of operation and maintenance, including the established habitats.

8.10 Embedded Design Mitigation

8.10.1 This section contains the avoidance and embedded mitigation measures relevant to biodiversity that are already incorporated into the Scheme design, as described in **PEIR Volume I Chapter 2: The Scheme**. At this stage, this is a preliminary list of committed embedded mitigation measures and is not intended to be definitive or comprehensive.

8.10.2 Embedded avoidance and mitigation measures are incorporated into the Scheme, in line with national and local planning policy (as presented in **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**). As a first principal, the Scheme has sought to avoid IEFs and where this has not been practicable, then embedded mitigation measures have been added to form an integral, committed and deliverable part of the Scheme design that does not comprise standard construction practices. They are assumed to be implemented (to be formalised into the Framework CEMP, secured through the DCO) and are therefore factored into the determination of significant effects.

8.10.3 A summary of the avoidance and mitigation measures embedded into the Scheme to minimise construction impacts on biodiversity are presented below. These measures are provided on the basis of baseline conditions known at the time of reporting (February 2024). The ongoing baseline surveys are likely to record further IEFs which will need consideration in the final Scheme design and, if required, the Scheme design will be further refined to include more embedded mitigation, as appropriate, should forthcoming baseline data suggest it is required or would be advantageous. The specifics and quantity of any further appropriate mitigation will be informed by the baseline surveys and incorporated into the Scheme design submitted with the DCO application.

Design and Construction

8.10.4 Embedded mitigation measures are incorporated into the Scheme, in line with national and local planning policy (as presented in **PEIR Volume III Appendix 8-1: Legislation, Policy and Guidance (Ecology)**). As a first principal, the Scheme has sought to avoid IEFs and where this may not be possible, then embedded mitigation measures have been added to form an

integral, committed and deliverable (and will be formalised into the Framework CEMP, secured through the DCO) part of the design of the Scheme that does not comprise standard construction practices.

8.10.5 Embedded measures are taken into account prior to the assessment of effects in order to avoid considering assessment scenarios that are unrealistic in practice i.e. effects do not take account of measures even though they are likely to be standard practice and/or form part of the Scheme design. These have been followed through into the assessment to ensure that realistic likely environmental effects have been identified.

Measures Embedded into the Scheme Design

8.10.6 The Scheme design (as presented in **PEIR Volume II Figure 2-3: Indicative Site Layout**) avoids all sites statutorily designated for their biodiversity value and avoids or seeks to minimise impacts on sites that are non-statutorily designated for their biodiversity value. Measures embedded within the Scheme design ensure that designated sites are not adversely impacted during construction, operation and maintenance, or decommissioning e.g. through siting construction routes away from designated sites, incorporating suitable buffer zones and erection of temporary construction fencing to avoid incursion into exclusion zones. Furthermore, an Ecological Clerk of Works (ECoW) will oversee works, as necessary, to ensure embedded mitigation measures are implemented.

Habitat Avoidance Measures

8.10.7 The Scheme has been designed to avoid key nature conservation and ecological features present within or adjacent to the Site. Accordingly, the following buffers from key habitat features have been applied:

a. All woodland – at least 15 m;

b. All trees within hedgerows, lines of trees and individual trees – protected by clearly defined root protection areas, concordant with the requirements for each individual tree, in line with British Standard BS 5837: Trees in relation to design, demolition and construction – Recommendations (Ref. 8-71);

c. Watercourses (where practicable and open trenching is not required during construction) – at least 10 m from the bank-top of the watercourse to protect riparian habitats and to mitigate for potential hazards such as chemical and soils spills into watercourses and avoid potential direct impacts to watercourses and any protected species that may use them;

d. Standing water - at least 20 m; and

e. Hedgerows (without trees) – where practicable, at least 5 m.

8.10.8 Measures to ensure the sustainable management of the soil resources which are disturbed by the Scheme (and their associated seedbanks) and which support the habitats within the Site will be based upon standard industry good practice measures such as those in Defra's Code of Practice (Ref. 8-75) ensuring that stored soils retain their quality and function. Additionally soils of different types or supporting different habitats will be stored separately and replaced in the area they were taken from so that the incorporated seedbank is not lost. These measures will be set out in a Soil

Management Plan (SMP) to be provided in advance of construction, secured through a Requirement attached to the DCO.

Framework Construction Environmental Management Plan

8.10.9 The Framework CEMP (included as **PEIR Volume III Appendix 2-1: Framework Construction Environmental Management Plan**) outlines the standard embedded good practice measures that will be implemented during construction of the Scheme to mitigate construction-related effects on biodiversity associated with dust deposition, air pollution, pollution incidents, water quality, light, noise and vibration. The Framework CEMP will be further refined for the ES and will be used as the basis for the contractor to prepare a detailed (construction issue) CEMP prior to construction once all details of the Scheme are known. Production of the detailed CEMP will be secured through a requirement attached to the DCO ensuring the prescribed measures are effectively communicated and implemented.

Vegetation Clearance

8.10.10 Vegetation clearance will be undertaken in advance of construction and at an appropriate time of year (dependant on habitat) so as to avoid the nesting bird period and incidental injuring or killing of animals, such as Brown Hare or reptiles.

8.10.11 Post-construction, any temporary habitat loss across the Site (i.e. where there are temporary construction compounds) will be restored, where required.

Security Perimeter Fencing

8.10.12 A permanent perimeter fence will be implemented early in the construction phase to secure the Solar PV Site and prevent construction activity in proximity to peripheral habitats and retained habitats within the Site. The fence design will include gaps or suitable gates to allow mammals that may use woodland or scrub habitats, including Badger, Brown Hare, and Hedgehog, to pass underneath at strategic locations and this fence will be maintained during operation and maintenance of the Scheme. Equally, in some locations, gaps will be avoided to allow the security fencing to act as an anti-predator fence, particularly in areas targeted at providing habitat for ground-nesting birds.

8.10.13 Temporary heras-style fencing (which does not impede the movement of small mammals) will be used to demarcate the working width of the Grid Connection Corridor. This fencing will also prevent construction activity in proximity to retained vegetation, in particular HaPI and designated sites (e.g. LWS) within and adjacent to the Site.

Construction Lighting

8.10.14 During construction, works will be restricted to daylight hours wherever practicable to remove the need for artificial lighting, with focussed task specific lighting provided where this is not possible, unless directed by authorities or areas requiring road closures. Within construction compounds and at welfare areas, Passive Infra-Red (PIR) controlled lights (motion sensors) will be used outside of core working hours. Task specific and fixed

general lighting may be required in winter periods (early mornings and up to 19:00) to meet safety requirements. Additionally, lighting would be used by the security teams during their regular checks (further details on lighting design are found in **PEIR Volume I Chapter 2: The Scheme**.

8.10.15 Where lighting is required, it will conform to good practice guidelines (Ref. 8-76) with respect to minimising light spill into adjacent habitats and prevent disturbance to bats and other species, in so far as it is reasonably practicable. With reference to **PEIR Volume I Chapter 2: The Scheme**, the following such measures will be taken:

a. Lights installed will be of the minimum brightness and/or power rating capable of performing the desired function;

b. Light fittings will be used that reduce the amount of light emitted above the horizontal (reduce upward lighting);

c. Light fittings will be positioned correctly, inward facing and directed downwards;

d. Direction of lights will seek to avoid spillage onto neighbouring properties, habitats, highway, or waterway; and

e. PIR controlled lights (motion sensors) will be used except where temporary focussed task specific lighting is required.

Works Adjacent to Watercourses and Watercourse Crossing

8.10.16 Where watercourses/ditches (not Main Rivers – which are to be crossed by non-intrusive techniques e.g. Horizontal Directional Drilling (HDD)) are crossed by cabling works and open cut techniques are required, habitats that are temporarily lost will be reinstated after installation.

8.10.17 The installation of new culverts will be avoided. Where small watercourses/ditches (not Main Rivers) are crossed for access (either temporarily during construction or permanently during operation and maintenance), new crossings will be clear-span and wide enough to avoid the loss of in-channel and riparian habitats.

8.10.18 No works will be undertaken within at least 10 m of the banktop of watercourses, which is considered sufficient to avoid potential direct impacts to the river and species using them. The CEMP will specify requirements for the safe storage of chemicals/other hazardous materials (e.g. fuel) to prevent them reaching watercourses during flood events during construction.

8.10.19 The depth of HDD will be 1.5 m below the bed of any watercourse, however, should further surveys identify the presence of sensitive fish species, then there is the potential to increase the depth to 5 m to limit disturbance to these species.

Drainage Strategy

8.10.20 A drainage strategy will be developed to manage surface water runoff and to reduce the likelihood and severity of potential pollution incidents and flooding affecting watercourses and the local ditch network to reduce or eliminate adverse effects for aquatic and riparian species and habitats.

Wildlife Legislation Compliance

8.10.21 To comply with relevant wildlife legislation, pre-construction surveys, such as for breeding birds, Badger and/or bats (if roost features are impacted), will be undertaken to support the baseline survey findings. The purpose of these preconstruction surveys is to ensure mitigation during the construction phase is based on the latest protected species and invasive species information.

8.10.22 During construction and operation and maintenance, where protected species are present within the Site, Reasonable Avoidance Measures (RAMs), including appropriate buffers (of up to 30 m) around any identified Badger setts, or trees with bat roost potential (a buffer of 15 m) will be applied throughout the Scheme (e.g. from Solar PV Panels and along the Grid Connection Corridor). The implementation of measures to avoid animals being injured or killed within construction working areas, through exclusion, will prevent them falling into and becoming trapped in excavations.

8.10.23 Site preparation works will be timed to avoid the nesting bird period i.e. March to August (inclusive), where practicable, and any vegetation clearance proposed within the nesting bird period will be checked for the presence of any nests by a suitably experienced ecologist, prior to vegetation removal, and if active nests are found, then appropriate buffer zones would be put in place and the area monitored until the young birds have fledged.

8.10.24 Checks for nesting birds listed under Schedule 1 of the WCA (Ref. 8-1), especially Barn Owl will be carried out where the Scheme intersects or passes close to suitable breeding habitats or known breeding locations for these species, and where the final package of mitigation cannot be relied upon to eliminate potential disturbance. If nesting Schedule 1 birds are found close to the works area, works within a stand-off around the nest may need to be suspended for the duration of the breeding period. The timing of this measure and size of the standoff would be species and site-specifiapproximately

8.10.25 Where required, mitigation strategies will be prepared for protected species. Where required, applications for species licences (or the DLL scheme, with regards to GCN) from Natural England will be submitted in advance of works for relocation of animals away from construction areas sufficiently in advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.

8.10.26 Ecological surveys are ongoing and whilst the desk study has identified INNS within the Study Area, their presence/absence within the Site has not yet been confirmed. Pre-construction and pre-decommissioning surveys will be undertaken to provide an update on the presence and location of any INNS, the findings of which will inform the implementation of measures to prevent their further spread. This will include production of a Biosecurity Plan prior to construction (detailed in the Framework CEMP, with a detailed CEMP broadly in line with the Framework CEMP secured via a Requirement of the DCO) which will set out procedures to ensure that no invasive species are brought onto the Site (e.g. WCA Schedule 9 species) (Ref. 8-1). In the event that any future infestations of invasive non-native species are identified prior to and or during the development process, exclusion zones will be established around them and a suitably qualified ecologist contacted for advice as required.

Operation and Maintenance

8.10.27 The general principles to be followed during operation and maintenance of the Scheme to minimise impacts are presented below. These will be formalised through the Framework OEMP which will be submitted with the DCO application.

8.10.28 During operation and maintenance of the Scheme there is no requirement for artificial lighting in areas of solar PV other than during temporary periods of maintenance/repair. All routine maintenance activities, except Solar PV Panel cleaning (expected to be conducted once every two years), will be scheduled for daylight hours as far as is practicable and therefore it is anticipated that focussed task specific lighting should only be required in the event of emergency works/equipment failure requiring night-time working or Solar PV Panel cleaning. The Solar PV Panels would be cleaned at night when they are cool. Solar PV Panel cleaning would be lit by tractor mounted lighting which is similar to night-time arable harvesting which are currently undertaken within the Site. It is therefore anticipated that focussed task specific lighting should only be required in the event of emergency works/equipment failure requiring night-time working or Solar PV Panel cleaning. Where lighting is required during operation and maintenance, it will conform to good practice guidelines with respect to minimising light spill into adjacent habitats and prevent disturbance to bats and other species.

8.10.29 Outside of core working hours PIR controlled lights (motion sensors) will be used. Any compounds for the On-Site Substation will have inward facing PIR controlled security lighting installed at each corner of the compound. Field Station Units and the control buildings for the On-Site Substation will likely require some internal lighting (to be manually activated when needed), but light spillage would be minimal (through doorways when open).

8.10.30 The Scheme's Surface Water Drainage Strategy will include measures to manage surface water runoff during operation and maintenance and will reduce the likelihood and severity of potential pollution incidents and flooding affecting watercourses and the local ditch network to reduce or eliminate adverse effects for aquatic and riparian species and habitats. A Framework Surface Water Drainage Strategy will be provided with the ES, with a detailed Surface Water Drainage Strategy being prepared by the contractor post-consent (as secured by DCO Requirement).

8.10.31 The creation and subsequent management of habitats will be determined by the characterisation of the existing baseline. However, management will seek to maximise floristic diversity, which will require low density and short frequency, sheep grazing (conservation grazing) or an appropriate, sensitive mowing regime.

8.10.32 Any required management of vegetation within the Scheme will be undertaken in accordance with legislative requirements associated with breeding birds e.g. undertaken outside of the bird nesting season (typically March to August inclusive). The management of grassland habitats will be undertaken in a manner that increases biodiversity value, with sensitive management regimes taking into account flora and fauna sensitivities, e.g. nesting birds and the presence of reptiles and amphibians. It is likely that localised management of trees and hedgerows will be required, but again

this will be consistent with legislative requirements and the provisions for maximising biodiversity value. This will be set out in the Framework LEMP.

8.10.33 A programme of monitoring will be established prior to operation and maintenance to ensure that biodiversity measures are implemented according to plan with necessary remediation.

Decommissioning

8.10.34 The general principles to be followed in the decommissioning of the Scheme will include measures to mitigate likely significant decommissioning related effects on biodiversity. These will be formalised through the Framework DEMP which will be submitted with the DCO application. Whilst the majority of mitigation measures will be similar to those during construction (as above), monitoring undertaken during the operation and maintenance phase and pre-decommissioning surveys will inform any mitigation and protected species licencing, as required at the time of decommissioning. A detailed DEMP will be prepared and agreed with the relevant authorities at the time of decommissioning, in advance of the commencement of decommissioning works.

8.11 Screening for Potential Impacts and Effects

8.11.1 An initial screening of the potential for impacts and effects to arise from the construction, operation and maintenance, and decommissioning phases of the Scheme as described in **PEIR Volume I Chapter 2: The Scheme** on the IEFs identified in Table 8-10 is provided in Table 8-11 to Table 8-12, to focus the potential impact pathways likely to require further detailed assessment.

8.11.2 This initial screening is based on the characterisation of the baseline conditions known to date, in the absence of any mitigation over and above that which is currently embedded in the design. As such the ‘worst case assessment’ presented is reflective of the current baseline information held and associated professional judgement applied to the assessment of effects.

8.11.3 The further surveys identified in Table 8-2 may identify additional IEFs to those presented in Table 8-10. In addition, once the baseline conditions are fully defined and with consideration of the embedded avoidance and mitigation measures set out in Section 8.10, it is likely that there will be a number of additional beneficial effects on IEFs to that presented in this PEIR, including benefits from a change in land management away from intensive agriculture (including the use of pesticides and fertilisers) to permanent low input grasslands and sympathetically managed boundary features e.g. hedgerows.

8.11.4 Accordingly, where the current characterisation of the baseline and assessment have identified that potential or reasonable likely presence of an IEF, but this is either not confirmed or the extent of any presence fully established yet, **Table 8-11** and **Table 8-12** sets out how the Scheme has either already embedded mitigation to avoid a potential effect occurring or identifies whether further additional mitigation may be required (subject to outcomes of detailed surveys confirming there is in fact an IEF which may be affected).

Sites Statutorily and Non-Statutorily Designated for their Biodiversity Value

8.11.5 The statutory and non-statutory designated sites that have been assessed, based on the baseline data identified during the desk study, are presented in **Table 8-11**. Where there is the potential for effects to occur on designated sites, then this is stated and the relevant receptors assessed further on in this PEIR (as presented in Table 8-13) to determine the significance of that effect.

Table 8-11: Determination of Potential Impacts and Effects on Relevant Ecological Features – Designated Sites

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
Thorne Moor SAC	Very High	**Construction**: This SAC (primary reason being degraded raised bogs, still capable of natural regeneration) is 8 km east of the Solar PV Site. There are no ecological connections (as there are roads (including the M18) which sever the areas between the Scheme and the SAC) or hydrological links (there are no connecting watercourses, as reviewed from ordnance survey mapping) between this SAC and the Site (see also **PEIR Volume I Chapter 9: Water Environment**). NE in their scoping response agreed that this SAC can be scoped out of the assessment and that there are no direct ecological or hydrological connections. Given the distance between the Site and this SAC, there will be no habitat loss within the SAC; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with Thorne Moor SAC. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Thorne Moor SAC.	No
		Operation and Maintenance: Given the distance and lack of pathways between the SAC and the Site it is not considered there are any impacts arising during operation and maintenance of the Scheme that could affect Thorne Moor SAC.	No
		Decommissioning: As with construction, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Thorne Moor SAC during decommissioning activities.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
Thorne and Hatfield Moors SPA	Very High	**Construction**: This SPA (which is designated for breeding Nightjar) is 8.5 km east of the Solar PV Site. There are no ecological connections (as there are roads (including the M18) which sever the area between the Scheme and the SPA) or hydrological links (there are no connecting watercourses, as reviewed from ordnance survey mapping) between this SAC and the Site (see also **PEIR Volume I Chapter 9: Water Environment**). NE in their scoping response agreed that this SPA can be scoped out of the assessment and that there are no direct ecological or hydrological connections. Given the distance between the Site and this SPA, there will be no direct impacts on habitat within the SPA; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with Thorne and Hatfield Moors SPA. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Thorne and Hatfield Moors SPA.	No
		Operation and Maintenance: Given the distance and lack of pathways between Thorne and Hatfield Moors SPA and the Site it is not considered that there are any impacts arising during operation and maintenance of the Scheme that could affect Thorne and Hatfield Moors SPA.	No
		Decommissioning: As with construction, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Thorne and Hatfield Moors SPA during decommissioning activities.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
Hatfield Moor SAC	Very High	**Construction**: This SAC (which is designated for its remnant bog and fen peatlands) is 8.5 km east of the Solar PV Site. There are no ecological connections (there are roads (including the M18) and settlements which sever the Scheme and the SAC) or hydrological links (there are no connecting watercourses, as reviewed from ordnance survey mapping) between this SAC and the Site (see also **PEIR Volume I Chapter 9: Water Environment**). NE in its scoping response agreed that this SAC can be scoped out of the assessment and that there are no direct ecological or hydrological connections. Given the distance between the Site and this SAC, there will be no direct impacts on habitat within the SAC; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with Hatfield Moor SAC. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Hatfield Moor SAC.	No
		Operation and Maintenance: Given the distance and lack of pathways between the SAC and the Site it is not considered that there are any impacts arising during operation and maintenance of the Scheme that could affect Hatfield Moor SAC.	No
		Decommissioning: As with construction, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Hatfield Moors SAC during decommissioning activities. of	No
Shirley Pool SSSI	High	**Construction**: At its closest point to the Site, Shirley Pool SSSI is approximately900 m south of the Site. This part of the Site that is closest	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		to the SSSI (Moss Road, to the east of Askern) is included within the Scheme for temporary works required in the road corridor (street furniture removal) to enable access. Shirley Pool SSSI is 3.0 km west of the Grid Connection Corridor and 3.0 km south west of the Solar PV Site. There are no ecological connections (there are minor roads and settlements between the Scheme and the SSSI) or hydrological links (there are no connecting watercourses, as reviewed from ordnance survey mapping) between this SSSI and any part of the Site (see also **PEIR Volume I Chapter 9: Water Environment**). As the SSSI is approximately 900 m outside of the Site, there will be no direct impacts on habitat within the SSSI; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with Shirley Pool SSSI. Embedded mitigation measures (see Section 8.10), formalised in the Framework CEMP, will ensure no impact on the integrity or the functioning of Shirley Pool SSSI through use of standard environmental protection measures. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of Shirley Pool SSSI.	
		Operation and Maintenance: Given the distance and lack of pathways between the SSSI and the Site it is not considered that there are any impacts arising during operation and maintenance of the Scheme that could affect Shirley Pool SSSI.	No
		Decommissioning: As with construction, there will be no disturbance or direct impact to this SSSI, fragmentation of habitats, habitat degradation or species mortality arising from decommissioning	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		activities and any impacts at the time of decommissioning would be mitigated fully in line with relevant legislative and policy requirements. Measures to remove or reduce impacts during decommissioning will be included within the Framework DEMP, secured as part of the DCO Requirements.	
Four non-statutory designated sites within the Site	Medium	**Construction**: Four non-statutory designated sites are within the Site, these being: Wrancarr Drain and Braithwaite Delves LWS, Trumfleet Pit LWS and Trumfleet Pond LWS, which are all within the Grid Connection Corridor and Went Valley (Part) LWS which is within the Solar PV Site. These LWS are all predominantly designated for their habitats. Went Valley (Part) LWS is within the Solar PV Site (see **PEIR Volume II Figure 8-3: Phase 1 Habitats**), but is avoided and outside of the developable areas of the Scheme, as presented in **PEIR Volume II Figure 2-3: Indicative Site Layout**. The exact habitat composition of the LWS within the footprint of the Grid Connection Corridor has not been determined. Regardless, it should be possible to avoid these LWS and route the working area away from LWS, with appropriate setbacks to protect adjoining habitat and including a 10 m set-back to protect watercourses and riparian habitats. Dependent on the construction methods used to install the Grid Connection Corridor, there is potential to directly impact on habitat within the three LWS situated within the Grid Connection Corridor, along a working area of approximately 30 m. Non-intrusive construction methods would not directly impact upon habitats within these LWS, although the exact route and construction methods to be used are yet to be defined. Once defined, measures to remove or	Yes (Wrancarr Drain and Braithwaite Delves LWS, Trumfleet Pit LWS and Trumfleet Pond LWS) – subject to Grid Connection Corridor refinement and development of construction methods

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		reduce impacts on the LWS will be included within the Framework CEMP submitted with the ES as part of the DCO application. Dependent on the construction methods utilised within the Grid Connection Corridor, construction may lead to temporary fragmentation of habitats within these LWS. However, boundary vegetation will be retained and protected, as much as is practicable, which will maintain connectivity for any species using LWS's. Embedded mitigation measures, as presented in Section 8.10, will ensure there is no impact on the integrity or the functioning of LWS (through dust generation, noise or visual disturbance); that no construction related pollution would affect these LWS and consequently that there will be no species mortality of any species using these LWS. These standard environmental protection measures will be adopted during construction and formalised in the Framework CEMP, secured as part of the DCO Requirements.	No (Went Valley (Part) LWS)
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to designated site features (such as through noise, water quality, air quality, lighting or visual) which could affect LWS within the Site. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of these non-statutory designated sites during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and any impacts at the time of decommissioning would be mitigated fully in line with relevant legislative and policy requirements. The mode of decommissioning for	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Grid Connection Cables would be dependent upon government policy and good practice at that time (as presented in **PEIR Volume I Chapter 2: The Scheme)**. Whilst it is preferred to leave the Grid Connection Cables *in situ*, as this avoids disturbance to overlying land and habitats, the Grid Connection Cables can be removed by opening up the ground at regular intervals and pulling the Grid Connection Cables through to an extraction point, avoiding the need to open up the entire length of the Grid Connection Cables. Therefore, dependent on the decommissioning methods used within the Grid Connection Corridor, it should be possible to avoid siting extraction points within LWS's which will avoid any impact pathways to these sites. Went Valley (Part) LWS will be outside of the developed areas of the Solar PV Site, as presented in **PEIR Volume II Figure 2-3: Indicative Site Layout** and will be avoided with appropriate setbacks and embedded mitigation (e.g. pollution control) to remove pathways to impacts on this LWS. Measures to remove impacts to LWS's during decommissioning will be included within the Framework DEMP, submitted with the ES as part of the DCO application and will include siting extraction points away from LWS's (if cabling is to be removed) and pollution control.	
Ten non-statutory designated sites outside of the Site, but within 100 m of the Site	Medium	**Construction**: Ten LWS (including cLWS) are outside of the Site but within 100 m of the Site Boundary, these being: Marsh Lane LWS, Fenwick Churchyard LWS, Bunfold Shaw LWS, Thorpe in Balne/Kirk Bramwith Area LWS, Fenwick Hall Moat LWS, Bentley Tilts and Course of Old Ea Beck LWS, Warren House Park cLWS, Barnby Dun Old Don Oxbow LWS and Broad Ings Oxbow LWS. All are predominantly designated for their habitat and there are ecological or hydrological connections between these LWS's and the Site.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		There will be no loss of habitat within these LWS's, nor fragmentation of habitats, or of populations of species using habitats within any of these non-statutory designated sites during construction. Boundary vegetation, such as hedgerows and ditches, potentially linking LWS to the Site, will be retained. Embedded mitigation measures, as presented in Section 8.10, will ensure there is no impact on the integrity or the functioning of LWS that no construction related pollution would affect these LWS (e.g. through management of surface water and sediment runoff) and consequently that there will be no species mortality of any species using these LWS. These standard environmental protection measures will be adopted during construction and formalised in the Framework CEMP, secured as part of the DCO Requirements. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of these non-statutory designated sites.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to designated site features (such as through noise, water quality, air quality, lighting or visual) which could affect LWS within 100 m of the Site. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon these non-statutory sites during operation and maintenance of the Scheme.	No
		Decommissioning: Any impacts at the time of decommissioning would be mitigated fully in line with relevant legislative and policy requirements, although there is unlikely to be any disturbance to LWS, habitat degradation or species mortality. Measures to remove or	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		reduce impacts during decommissioning will be included within the Framework DEMP, secured as part of the DCO Requirements.	
32 non-statutory designated sites outside of the Site, and beyond100 m from the Site	Medium	**Construction**: These LWS (including cLWS) are all outside of the Site and >100 m from the Site Boundary, with the closest LWS being Moss Brick Pond LWS which is approximately110 m from the Solar PV Site. All are predominantly designated for their habitat. There are no ecological connections (as there are minor roads which sever the area between the Scheme and these LWS's) or hydrological links (there are no connecting watercourses, as reviewed from ordnance survey mapping) links between these LWS and the Site. The construction of the Scheme will not directly impact on habitat within these non-statutory designated sites as they are outside of the Site and consequently, there will be no fragmentation of habitats, or of populations of species using habitats within any of these non-statutory designated sites during construction. Boundary vegetation, such as hedgerows and ditches, potentially linking these LWS to the Site, will be retained. Embedded mitigation measures, as presented in Section 8.10, will ensure there is no impact on the integrity or the functioning of LWS; that no construction related pollution would affect these LWS (e.g. through management of surface water and sediment runoff) and consequently that there will be no species mortality of any species using these LWS. These standard environmental protection measures will be adopted during construction and formalised in the Framework CEMP secured as part of the DCO Requirements.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of these non-statutory designated sites.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to designated site features (such as through noise, water quality, air quality, lighting or visual) which could affect LWS (or cLWS) greater than 100 m from the Site Boundary. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of these non-statutory designated sites during operation and maintenance of the Scheme.	No
		Decommissioning: Given the distance of these LWS from the Site Boundary and the lack of pathways, as with construction, there will be no disturbance or direct impact to these LWS (or cLWS), fragmentation of habitats, habitat degradation or species mortality from decommissioning activities and any impacts at the time of decommissioning would be mitigated fully in line with relevant legislative and policy requirements. Measures to ensure impacts do not occur during decommissioning will be included within the Framework DEMP, submitted with the ES as part of the DCO application.	No

Habitats and Species

8.11.6 The relevant ecological features that have been identified to date (based on the desk study and field surveys) and therefore considered in this PEIR, are presented in Table 8-12. Where there is the potential for an effect to occur on known IEFs, then this is stated and the relevant receptor assessed further on in this PEIR (as presented in Table 8-13) to determine the significance of that effect.

8.11.7 Where the current characterisation of the baseline and assessment have identified that potential or reasonable likely presence of an IEFs, but this is either not confirmed or the extent of any presence fully established yet, Table 8-12sets out how the Scheme has either embedded mitigation to avoid an effect occurring or whether further additional mitigation may be required, subject to outcomes of detailed surveys, to avoid and reduce an effect.

Table 8-12: Determination of Potential Impacts and Effects on Relevant Ecological Features – Habitats and Species

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
Habitat – broad leaved woodland (semi-natural), including Ancient Woodland	Medium	**Construction**: Broad-leaved woodland habitat was recorded within the Site and will be retained and protected. There is no Ancient Woodland within the Site Boundary. There will be no direct impacts on woodland habitat; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with woodland habitats. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO Requirements) and include the protection of retained habitats and pollution prevention will ensure no impact on the integrity or the functioning of woodland habitats through use of standard environmental protection measures. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon the integrity or functioning of woodland habitats.	No
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained woodland habitats and maintenance is not expected to be required for retained woodland. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon woodland habitats during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO Requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	
Habitat – veteran/ancient trees	Low	**Construction**: This habitat was recorded outside the Site (through the desk study) and will be avoided. Any veteran or ancient trees that are identified within the Site during ongoing ecological surveys in 2024 will also be retained and avoided. There will be no direct impacts on veteran or ancient trees; no fragmentation of habitats, or of populations of species using habitats and no species mortality of any species associated with veteran or ancient trees. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) and including the protection of retained habitats and pollution prevention will ensure no impact on the integrity or the functioning of retained trees through use of standard environmental protection measures. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon veteran trees.	No
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained trees and maintenance is not expected to be required. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon veteran or ancient trees during operation and maintenance of the Scheme.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO Requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	No
Habitat – Neutral grassland – semi-improved (including B6–- poor semi-improved grassland)	Medium	**Construction:** Detailed surveys will be undertaken in spring/summer 2024 to determine the value of grassland habitats, some of which have been identified during the desk study as being Coastal and Floodplain Grazing Marsh. These surveys will be used to inform whether specific mitigation is required and inform the evolution of the Scheme design. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (and secured as part of the DCO requirements) and include avoidance (where practicable) of priority habitat, protection of retained habitats and pollution prevention will ensure the integrity of retained habitats is not adversely affected.	Yes – pending further assessment
		Operation and Maintenace: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained grassland habitats. Any management of retained grasslands will be undertaken to increase value and condition. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon woodland habitats during operation and maintenance of the Scheme.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	No
Habitat – swamp	Medium	**Construction:** This habitat is in the northern part of the Solar PV Site and will be retained and outside of the developable areas of the Scheme, as presented in **PEIR Volume II Figure 2-3: Indicative Site Layout**. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include avoidance of this priority habitat, protection of retained habitats and pollution prevention to ensure the integrity of retained swamp habitats are not adversely affected.	No
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained habitats and maintenance is not expected to be required for swamp habitats. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon swamp habitats during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	
Habitats – Running Water	Medium	**Construction**: This habitat is found throughout the Site. Several ordinary watercourses and ditches will be crossed by access roads or cable crossings, requiring open-cut crossings, or culvert improvements. Therefore, there will be a direct loss of running water habitat and there will be potential fragmentation of habitats, or of populations of species using habitats. Main Rivers will be avoided, with cable crossings installed by non-intrusive techniques (HDD). HDD at insufficient depths can generate the potential effect of sediment mobilisation and disturbance of the bed of any watercourse, however, typically cables will be buried at a minimum depth of 1.5 m below the bed of any watercourse through HDD and this embedded mitigation removes this potential impact. Within the Solar PV Site, there are several watercourse/ditch crossings, which are required for access, although these may be updated during detailed design. The majority of these are existing crossing points that may require improvement, although any such improvements will ensure that running water habitats are not impacted through the implementation of mitigation measures outlined in the Framework CEMP (e.g. water quality monitoring and buffer zones). Indicative new crossing points have been included within the design to facilitate construction and similarly will be installed to allow continued connectivity along watercourses to allow fish passage. Localised SuDS, such as swales and infiltration trenches, will be used to control runoff to remove any indirect impacts to running water habitats. A full	Yes

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		list of crossing methods will be provided in the Framework CEMP and an explanation of these techniques is provided in **PEIR Volume I Chapter 9: Water Environment**. Any construction within the vicinity of watercourses may require temporary lighting, which has the potential to spill into adjacent watercourses. Artificial lighting of these habitats may disrupt species' movements. Therefore, any lighting that is required for the construction of the Scheme will be directed away from existing retained and sensitive habitats to minimise light disturbance to species associated with these habitats. Any requirements for task-specific lighting during construction will be designed to be downward directional and will only be used for the duration of the task. All temporary lighting will need to satisfy health and safety requirements, as well as minimising potential effects on the surrounding areas by minimising sky glow, glare, and light spillage. During construction, there is potential for pollutant spills and surface runoff into the watercourses and these spills have the potential to adversely affect habitats and species associated with running water habitats. However, standard environmental protection measures will be implemented and adopted during construction, formalised through the Framework CEMP secured as part of the DCO requirements and these measures will include dust suppression and pollution prevention. Consequently, indirect effects (such as disturbance and habitat degradation) to watercourses during construction will not occur.	
		Operation and Maintenance: There are no impact pathways (e.g. habitat loss or degradation), during operation and maintenance of the Scheme which could affect running water.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		A change in land use from agricultural use to solar will see benefits in the water table of these habitats, which has previously been artificially lowered for the purpose of irrigation of arable fields.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats through leaving buried cables *in situ* and pollution (e.g. spillages, noise, light) control.	No
Habitat – arable margins	Medium	**Construction:** Detailed surveys will be undertaken in spring/summer 2024 to determine the value of arable margins and these surveys will be used to inform specific mitigation requirements and inform Scheme design evolution. However, it should be possible to retain and protect the majority of arable margins, particularly any that support protected or notable flora. Security fencing will be installed at an early stage to protect retained habitats from incursion during construction. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include avoidance (where practicable) of protected and notable flora, protection of retained habitats and pollution prevention to ensure the integrity of retained habitats are not adversely affected. Furthermore, the setbacks (see Paragraph 8.10.7) from watercourses and boundary habitats will likely overlap with and include the majority of arable margins.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained arable margins. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon arable margins during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	No
Habitat – hedgerows	Medium	**Construction:** Detailed surveys will be undertaken in spring/summer 2024 to determine the importance of hedgerows and these surveys will be used to inform specific mitigation requirements and inform Scheme design evolution. Whilst the embedded mitigation includes the retention and avoidance of the majority of hedgerows, there will be the loss of sections of hedgerow during construction, to facilitate the Grid Connection Corridor, new fence lines and access routes. These habitats will be restored, post-construction, but there is likely to be a temporary (short-term) adverse effect on this habitat type. Embedded mitigation measures (see Section 8.10) will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include avoidance (where practicable) of hedgerows, protection of	Yes

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		retained habitats and pollution prevention to ensure the integrity of retained habitats is not adversely affected.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect retained habitats. Management of hedgerows will seek to increase their quality and value. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon hedgerows during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats and pollution (e.g. spillages, noise, light) control.	No
Aquatic Macroinvertebrates and Macrophytes	Likely importance of Low	**Construction:** Surveys have not yet been undertaken for aquatic macroinvertebrates and macrophytes. The construction of the Scheme will be offset (>10 m) from any watercourses and 20 m from standing water as detailed in the embedded design mitigation (see Paragraph 8.10.7). These offsets will prevent disturbance to aquatic and riparian habitats. Where ordinary watercourses and ditches are crossed, crossing points will be designed to allow continued connectivity along the watercourse, with a natural bed and no drop inlet or outlet. Where watercourses are open-cut for cable crossings, impacts will be temporary and habitats	Yes – pending further assessment

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		will reinstate within two years, with aquatic species re-colonising naturally from adjacent habitats. The construction of the Grid Connection Corridor and any internal access across the Site, where this crosses watercourses, will utilise non-intrusive methods to avoid physical disturbance to the watercourse, therefore avoiding disturbance to species, habitat loss, and direct mortality for aquatic species. During construction, there is potential for pollutant spills and surface runoff into watercourses which could adversely affect habitats and species. However, standard environmental protection measures will be implemented and adopted during construction, formalised through the Framework CEMP, secured through the DCO requirements. These measures will include dust suppression and pollution prevention. Consequently, indirect effects to watercourses supporting aquatic species during construction will not occur. There will be minimal mortality of any species associated with running water during construction of the Scheme, with appropriate mitigation to relocate aquatic species away from the works areas during construction. Where aquatic macroinvertebrates and macrophytes are lost during construction, these will rapidly re-colonise from adjacent habitats.	
		Operation and Maintenance: Artificial horizontally polarising surfaces (such as solar panels), the reflection-polarisation characteristics of which are similar to those of water, have the potential to attract water-leaving polarotactic insects posing a potential threat to these species. Aquatic macroinvertebrates in their terrestrial or airborne phase may be attracted to these surfaces, which may then disrupt their life cycle. Some aquatic insects are attracted to solar panels although this is an	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		unusual event dependent on the coincidence of several suitable conditions to trigger such behaviour e.g. wind direction and cloud cover. The likelihood of aquatic insects from this particular local aquatic habitat of Local Importance being attracted to large open areas of shiny surfaces is considered low given that such species will preferentially use smaller shiny surfaces. Most of the aquatic insect species identified during the desk study are of low conservation value, and do not use open water areas for any of their behaviours (i.e. few *Odonata* (dragonflies) were recorded for example). The impact of solar panels on these aquatic insects would therefore be negligible. It is not considered that there are any other impact pathways (e.g. habitat loss or degradation), during operation and maintenance of the Scheme which could affect aquatic macrophytes or macroinvertebrates. Therefore, there are considered to be no impact pathways that would impact either directly or indirectly upon aquatic macrophytes or macroinvertebrates.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction, and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats supporting aquatic macrophytes or macroinvertebrates (such as running water) at the time of decommissioning.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
Fish	Likely importance of Medium	**Construction:** Surveys have not yet been undertaken for fish. The construction of the Scheme will be offset (>10 m) from any peripheral watercourses, as detailed in the embedded design mitigation. These offsets will prevent disturbance to aquatic habitats supporting fish. Where ordinary watercourses and ditches are crossed, crossings will be designed to allow continued connectivity and fish passage along the watercourse, with a natural bed and no drop inlet or outlet. Where watercourses are open-cut for cable crossings, impacts will be temporary and habitats will reinstate within two years, with aquatic species re-colonising naturally from adjacent habitats; however, fish rescue may be required during construction where de-watering or over-pumping is required. The construction of the Grid Connection Corridor and any internal access or cabling across the Site, where this crosses watercourses, will utilise non-intrusive methods, where practicable, to avoid physical disturbance to the watercourse. During construction, there is potential for pollutant spills and surface runoff into watercourses which could adversely affect fish. However, standard environmental protection measures will be implemented and adopted during construction, formalised through the Framework CEMP, secured through the DCO requirements. These measures will include dust suppression and pollution prevention. Consequently, indirect effects to watercourses supporting fish during construction will not occur. Impacts on main rivers through HDD and construction activities (i.e. sediment mobilisation, noise, and vibration) will be avoided through measures formalised through the Framework CEMP, secured through the DCO, including HDD a minimum of 1.5 m below the bed of the	Yes – pending further assessment

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		watercourse. However, should further surveys identify the presence of sensitive fish species, then there is the potential to increase the depth to 5 m to limit disturbance to these species. A buffer of at least 10 m from the banktop of any watercourse, and directing lighting away from the watercourse will also be in place. With the above embedded mitigation in place, it is considered there will be minimal mortality of any species associated with running water during construction of the Scheme, with appropriate mitigation to relocate fish away from the works areas during construction.	
		Operation and Maintenance: There will be no habitat loss or degradation, during operation and maintenance of the Scheme which could affect fish. There are potential effects on fish and other aquatic fauna due to electromagnetic fields (EMF) from cables buried beneath watercourses. Such artificial EMF can disrupt migratory cues and predatory behaviour. It is considered, based on literature review and consideration of the strength of EMF from buried cables for the Scheme, that 5 m depth beneath the bed of any watercourse is sufficient depth to avoid impacts. As the depth of the cable is expected to be 1.5 m beneath the bed of any watercourse, there is the potential for effects of EMF during operation and maintenance of the Scheme, but the potential for these to occur will be determined following further survey and characterisation of the fish populations in relevant watercourses. Should further surveys identify the presence of sensitive fish species, then there is the potential to increase the depth to 5 m to limit disturbance to these species.	Yes – pending further assessment

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats supporting fish (running water) at the time of decommissioning.	No
Terrestrial Invertebrates	Likely importance of Low	**Construction:** A walkover surveys will be undertaken in spring/summer 2024 to determine the importance of habitats and their potential to support notable terrestrial invertebrate assemblages and species. These surveys will be used to inform specific mitigation requirements and inform Scheme design evolution. However, the majority of habitats that support or are likely to support terrestrial invertebrates will be retained and avoided, e.g. swamp habitat and hedgerows. Embedded mitigation measures (see Section 8.10) will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include avoidance (where practicable) of areas of greatest value to terrestrial invertebrates, protection of retained habitats and pollution prevention to ensure the integrity of retained habitats supporting terrestrial invertebrates is not adversely affected.	Yes, pending further assessment
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect terrestrial invertebrates and any maintenance of retained habitats will not affect terrestrial invertebrates. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		terrestrial invertebrates during operation and maintenance of the Scheme.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats supporting terrestrial invertebrates (where practicable), vegetation clearance being undertaken in a phased and sensitive manner and pollution (e.g. spillages, noise, light) control.	No
GCN	Likely importance of Low	**Construction:** There will be no loss of watercourses supporting GCN within the Site, although there may be temporary loss of habitat and disturbance to this species where non-intrusive crossing methods cannot be adopted. There will also be a temporary loss of terrestrial habitats, potentially used by GCN, although watercourses supporting GCN will be buffered to protect riparian habitats. The Applicant will continue to engage with Natural England to determine whether DLL is an appropriate means of mitigating impacts to GCN. If the DLL route is not pursued works would proceed under a Natural England protected species mitigation licence (where required), which would include appropriate mitigation. As set out in Section 8.10, embedded mitigation includes the preparation of mitigation strategies for protected species and where required, application for species licences from Natural England for relocation of animals away from construction areas sufficiently in	Yes, pending further assessment

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there are will be no habitat loss or disturbance to habitats (such as through noise or lighting)), that could affect GCN. Maintenance is not expected to be required for watercourses. Furthermore, the management of surface water and foul water drainage (see also **PEIR Volume I Chapter 9: Water Environment**) will ensure no hydrological impacts occur and that there are consequently no impacts upon habitats supporting GCN during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats supporting GCN (where practicable), vegetation clearance being undertaken in a sensitive manner and pollution (e.g. spillages, noise, light) control.	No
Reptiles – Grass Snake	Low	**Construction**: Grass Snake were recorded within the Solar PV Site in riparian habitats close to Fleet Drain and in grassland habitat bordering woodland edge. These habitats and other riparian habitats close to watercourses across the Solar PV Site (which may also support Grass Snake) are of value to Grass Snake and will be retained and avoided. All such habitats, known to support Grass Snake or with potential to support Grass Snake will, where practicable, be cleared in a sensitive manner (see Section 8.10) pre-construction to ensure that no mortality	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		occurs as reptiles will be displaced into adjacent habitats and away from construction activities. For the Grid Connection Cables, sensitive vegetation clearance, under the assumption of presence of reptiles in suitable habitat, will be adopted to displace reptiles into adjacent habitats and ensure no mortality occurs. Where direct impacts cannot be avoided (e.g. for construction compounds or substations) to habitat deemed as suitable to support reptiles within the Grid Connection Corridor, then further surveys will be undertaken in April/May 2024 to confirm presence/absence and confirm mitigation requirements. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured part of the DCO requirements) and include protection of retained habitats and pollution prevention, will ensure the integrity of retained habitats supporting reptiles is not adversely affected. Therefore, there are no impact pathways, either directly or indirectly, that would negatively impact upon reptiles.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats (such as through noise, water quality or lighting)) that could affect reptiles. Any maintenance of retained habitats potentially supporting Grass Snake, such as mowing of grassland beneath and between Solar PV Panels, has the potential to impact upon Grass Snake through mortality. However, this activity is expected to be undertaken at an appropriate time of year for the sensitive management of grassland (i.e. late summer/early autumn when temperatures are >5°C) when reptiles are active and can move away to avoid incidental injuring or killing of reptiles, concordant with the requirements for other species, such as nesting birds. Therefore, there are no impact	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		pathways, either directly or indirectly, that would impact upon reptiles during operation and maintenance of the Scheme.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include retention and avoidance of habitats supporting reptiles (where practicable), vegetation clearance being undertaken in a sensitive manner and pollution (e.g. spillages, noise, light) control.	No
Breeding Birds (General breeding bird assemblage)	Likely importance of Low	**Construction**: Habitats supporting the majority of breeding bird species throughout the Site, such as the majority of hedgerows and all woodland areas, will be retained. However, the construction of the Scheme will lead to the loss of arable habitat, used by a small number of breeding bird species such as Skylark, a species that is ground-nesting and relies on open space. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include protection of retained habitats, avoidance of the nesting bird period (typically this is March to August inclusive), pre-construction nesting bird checks and pollution prevention, will ensure the integrity of retained habitats supporting breeding birds is not adversely affected and that there is no fragmentation of habitats, or of populations of species using habitats and no species mortality of any breeding bird species.	Yes – pending further assessment
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		(such as through noise, water quality or lighting) that could affect breeding birds. Any maintenance of retained habitats potentially supporting breeding birds, such as mowing of grassland beneath and between Solar PV Panels, has the potential to impact upon breeding birds through mortality. However, this activity is expected to be undertaken between September and March, which is outside of the bird breeding season at an appropriate time of year to avoid incidental injuring or killing of breeding birds, concordant with the requirements for other species, such as reptiles. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon breeding birds during operation and maintenance of the Scheme.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, avoidance of the nesting bird period (typically this is March to August inclusive), pre-construction nesting bird checks and pollution prevention.	No
Breeding birds – territory of Barn Owl (a specially protected species) within the Solar PV Site.	Likely importance of Low	**Construction**: There will be no direct loss of woodland habitat or individual trees and buildings potentially supporting Barn Owl. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) and include protection of retained habitats, avoidance of the nesting bird period (typically for Barn Owl this is March to August inclusive although the species can nest outside of this period), pre-construction nesting bird checks and pollution prevention, will ensure	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		the integrity of retained habitats supporting breeding birds is not adversely affected and that there is no fragmentation of habitats, or mortality of Barn Owl. Therefore, there are no impact pathways, either directly or indirectly, that would negatively impact upon Barn Owl.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats (such as through noise, water quality or lighting) that could affect specially protected breeding birds. Maintenance of retained habitats (such as mature trees) potentially supporting such species is not expected to be required. However, pre-commencement checks will be required where any unexpected maintenance is required during the bird nesting season and on trees potentially supporting specially protected species. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon breeding birds during operation and maintenance of the Scheme	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, avoidance of the nesting bird period, pre-construction nesting bird checks and pollution prevention.	No
Non-breeding birds	Likely importance of Low	**Construction**: Whilst the baseline for non-breeding birds has yet to be fully defined, based on current understanding of baseline survey results any habitats supporting, or likely to support, the majority of non-	At this stage, no effects on non-breeding

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		breeding bird species throughout the Site, such as hedgerows and woodland areas, will be retained and the Scheme has been designed to minimise the amount of permanent habitat loss as much as is practicable. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (and submitted with the ES as part of the DCO application) will include protecting retained habitats, creation of new habitats and pollution prevention to ensure the integrity of retained habitats supporting non-breeding birds is not adversely affected and that there is no fragmentation of habitats, or of populations of species using habitats and no species mortality of any non-breeding bird species.	birds are anticipated
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to habitats (such as through noise, water quality or lighting)), that could affect non-breeding birds. Any maintenance of retained habitats potentially supporting non-breeding birds, such as mowing of grassland beneath and between Solar PV Panels, is not considered to have any impact on non-breeding birds. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon breeding birds during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		measures will include protecting retained habitats and pollution prevention.	
Bats – roosting	Low to Medium (depending on the species)	**Construction**: The current design of the Scheme avoids features used by roosting bats, such as woodland and mature trees identified as having potential to support roosting bats. This means there will be no loss of important habitats used by bats anywhere within the Site during construction. However, if the footprint of the Scheme design changes, resulting in any features that are likely to be directly impacted (e.g. from the cable routes/access) then further, more detailed bat roost surveys will be required at specific features (i.e. structures and trees with roost suitability) to inform mitigation and potential licence application in accordance with good practice guidance. Where construction works are undertaken within these buffer zones, there may be indirect impacts to roosts/potential roosts. However, these impacts would be avoided through use of a precautionary working method statement and the embedded mitigation measures presented in Section 8.10. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) will include protection of retained habitats, avoidance of important habitats to roosting bats, pre-construction checks and pollution prevention (including for lighting). These measures will ensure the integrity of retained habitats supporting, or potentially supporting, roosting bats is not adversely affected and that there is no fragmentation of habitats, or of populations of species using habitats and no species mortality of any bat species. Consequently, indirect effects to habitats supporting bats during construction will be avoided.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Therefore, there are no impact pathways, either directly or indirectly, that would negatively impact upon roosting bats.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats (such as through noise, water quality or lighting) that could affect roosting bats. Any maintenance of retained habitats potentially supporting roosting bats (such as mature trees) is not expected. However, pre-commencement checks will be required where any unexpected maintenance is required on trees potentially supporting roosting bats. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon roosting bats during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, pre-construction checks and pollution prevention.	No
Bats – foraging/commuting	Medium	**Construction:** The current design of the Scheme will avoid features used by roosting bats, such as woodland and mature trees identified as being important to commuting/foraging bats roosting bats. There will be loss of lower value grazed grassland and arable habitats used by bats within the Site. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) will include protection of retained habitats, avoidance	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		and minimisation of impacts to important habitats for commuting and foraging bats (e.g. hedgerows) and pollution prevention (including for lighting). These measures will ensure the integrity of retained habitats supporting, or potentially supporting, commuting and foraging bats is not adversely affected and that there is no fragmentation of habitats, or of populations of species using habitats and no species mortality of any bat species. Consequently, indirect effects to habitats supporting commuting and foraging bats during construction will be minimised or avoided. Therefore, there are no impact pathways, either directly or indirectly, that would negatively impact upon commuting/foraging bats.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats (such as through noise, water quality, lighting or visual) that could affect commuting or foraging bats. Any maintenance of retained habitats potentially supporting commuting or foraging bats (such as hedgerows) is not expected. However, recent research has suggested that numbers of foraging bats may be reduced by the presence of Solar PV Panels. This found that bats avoided fields with solar panels during operation and that total bat activity was almost halved at the boundaries of solar panel fields compared to that of control sites and at the centre of solar panel fields, bat activity dropped by two-thirds (Ref. 8-81). The reasons for these impacts was not fully determined, but it should be noted that these sites did not have any significant new tree/hedge planting, and/or grassland creation and may not be comparable to this Scheme	Yes

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		(and other large-scale DCO schemes) where significant areas of habitat compensation and enhancement are provided.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO Requirements. These measures will include protecting retained habitats, pre-construction checks and pollution prevention.	No
Riparian Mammals	Low	**Construction:** Whilst the baseline for riparian mammals has yet to be fully defined (to be completed in spring and summer 2024), the construction of the Scheme will seek to avoid ditches and watercourses where any Water Vole and Otter are recorded and these will be retained and suitably buffered. The construction of the Solar PV Site will be offset (>10 m) from any watercourses (see Section 8.10), therefore riparian habitats, including any watercourses used by Water Vole and Otter will be undisturbed. However, whilst the construction of the Grid Connection Corridor and internal accesses across the Site, will seek to adopt non-intrusive methods to avoid physical disturbance of watercourses found to support Water Vole and Otter, it is acknowledged that some may be subject to open cut trenching. Any potential impacts will depend upon the distribution of the species, which will be fully determined following completion of surveys in 2024. Embedded mitigation measures (see Section 8.10) to protect Water Vole and Otter habitat during construction will include pollution prevention and control, management of flood risk and maintaining	Yes – dependent on construction methods and species distribution within the Grid Connection Corridor.

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		connectivity for riparian mammals. These will be formalised in the Framework CEMP (secured as part of the DCO requirements). These will be formalised in the Framework CEMP (secured as part of the DCO requirements)	
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. there will be no habitat loss or disturbance to habitats (such as through noise, lighting or visual)), that could affect riparian mammals. Maintenance is not expected to be required for watercourses. Furthermore, the management of surface water and foul water drainage (see also **PEIR Volume I Chapter 9: Water Environment**) will ensure no hydrological impacts occur and that there are consequently no impacts upon habitats supporting riparian mammals during operation and maintenance of the Scheme.	No
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, pre-construction checks and pollution prevention.	No
Badger	Low	**Construction**: Based on the current distribution of Badger, as detailed in **PEIR Volume III Appendix 8-5: Badger Report (Confidential)**, the construction of the Scheme will be able to retain and avoid Badger setts recorded anywhere within the Site. The locations of existing Badger setts are outside the developable area, e.g. areas proposed for	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		solar PV and associated infrastructure, being found in existing (and retained) boundary features. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) will include protection of retained habitats, avoidance (and suitable buffers) of setts and pollution prevention (including for lighting). These measures will ensure the integrity of retained habitats supporting, or potentially supporting Badger are not adversely affected and that there is no fragmentation of habitats used by Badger and no species mortality. Consequently, indirect effects to habitats supporting Badgers during construction will be minimised or avoided. Pre-construction surveys will be undertaken to determine baseline conditions remain the same as currently recorded and if any changes to Badger distribution are identified and where setts cannot be reasonably avoided, then a NE licence may be required and mitigation measures updated accordingly.	
		Operation and Maintenance: During operation and maintenance of the Scheme, there will be no habitat loss or disturbance to habitats (such as through noise, water quality or lighting) that could affect Badger. Any maintenance of retained habitats potentially supporting Badger (such as woodland or hedgerows) is not expected. However, pre-commencement checks will be required where any unexpected maintenance is required within 30 m of known Badger setts or within habitats potentially supporting Badger. Therefore, there are no impact pathways, either directly or indirectly, that would impact upon Badger during operation and maintenance of the Scheme.	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, pre-construction checks and pollution prevention.	No
Other mammals (SPI (Ref. 8-9): Brown Hare, Hedgehog and Harvest Mouse)	Low	**Construction**: The construction of the Scheme will seek to retain and avoid the majority of habitats used by Brown Hare and the phased construction period, which will occur over many months, will retain Brown Hare within the Site, although this species maybe temporarily displaced around the Site during that time. The majority of habitats potentially supporting Hedgehog and Harvest Mouse, such as arable margins, scrub and hedgerows will be retained and avoided with any impacts to these habitats minimised as much as is practicable. Embedded mitigation measures (see Section 8.10) which will be formalised in the Framework CEMP (secured as part of the DCO requirements) will include protection of retained habitats potentially supporting these species, sensitive timing of vegetation clearance and pollution prevention, will ensure the integrity of retained habitats are not adversely affected and that there is no fragmentation of habitats, or of populations of species and that no species mortality occurs. Therefore, there are no impact pathways, either directly or indirectly, that would negatively impact upon Brown Hare, Hedgehog or Harvest Mouse (if present).	No
		Operation and Maintenance: During operation and maintenance of the Scheme, there are no pathways (e.g. habitat loss or disturbance to	No

IEF	Importance (see Section 8.5 and Table 8-3)	Potential Impacts (see Section 8.9)	Potential for an effect to occur?
		habitats (such as through noise, water quality, lighting or visual)), that could affect these SPI.	
		Decommissioning: Decommissioning impacts are expected to broadly align with those for construction and would require mitigating fully in line with relevant legislative and policy requirements at the time of decommissioning. Initial measures will be included within the Framework DEMP, secured as part of the DCO requirements. These measures will include protecting retained habitats, pre-construction checks and pollution prevention.	No

8.12 Significance of Effects

8.12.1 The significance of effects on known and predicted IEFs have been assessed following consideration of the potential impacts described in Section 8.11 and with consideration of the embedded mitigation measures outlined in Section 8.10 using the method as detailed in Section 8.5. The aim of the assessment was to identify potentially significant effects and determine the need, or potential need, for additional mitigation measures to those detailed in Section 8.10.

Construction

8.12.2 Accordingly, the evaluation has identified that during construction, per the conclusions in Section 8.11, there are potential impact pathways on the following known or predicted IEFs:

a. Temporary loss of habitat associated with Wrancarr Drain and Braithwaite Delves LWS, Trumfleet Pit LWS and Trumfleet Pond LWS, which are all within the Grid Connection Corridor;

b. Permanent loss of neutral grassland within the Solar PV Site;

c. Temporary loss of and fragmentation of running water habitats within the Site;

d. Temporary loss of hedgerows within the Site;

e. Temporary disturbance to aquatic macroinvertebrates and macrophytes;

f. Mortality to fish;

g. Temporary loss of habitat within the Solar PV Site of greater importance to terrestrial invertebrates;

h. Temporary loss of habitat used by GCN;

i. Loss of habitat used by ground-nesting birds; and

j. Temporary loss of and fragmentation of habitats supporting riparian mammals.

8.12.3 It is acknowledged that baseline surveys are ongoing and that these surveys may determine the presence of further IEFs, such as Water Vole. Although measures have been embedded within the Scheme design to avoid or minimise potential effects on predicted IEFs, where practicable, which means additional effects may be identified to those above, with further mitigation potentially being required. Following completion of surveys, all IEFs will be subject to detailed assessment, following the methods in Section 8.5 and updating the assessment presented for the IEFs identified to date in Section 8.11, and will be presented in the ES. Therefore, the absence of significant effects presented in this chapter does not preclude further significant effects arising as further ecological data becomes available and allows the full characterisation of the ecological baseline and identification of any additional IEFs.

8.12.4 Table 8-13 summarises the preliminary sensitivity (value) of IEFs, impacts and effects resulting from construction of the Scheme that are predicted at this stage. These will be further defined by ongoing ecological surveys which

will be used to reduce or remove the magnitude of impacts and potential for significant effects.

Table 8-13: Summary of Magnitude of Construction Impact and Significance of Effect

IEF	Sensitivity (Value)	Description of Impact	Magnitude of Impact	Effect Category	Potential for a Significant Effect?
Wrancarr Drain and Braithwaite Delves LWS	Medium	The construction of the Grid Connection Corridor for the Scheme is predicted to directly impact upon habitats within this LWS, although the exact construction methods within this area and habitats affected (as a result of limited survey information at the time of writing this PEIR) are yet to be defined.	Medium	Moderate adverse	Yes
Trumfleet Pit LWS	Medium	The construction of the Grid Connection Corridor for the Scheme is predicted to directly impact upon habitats within this LWS, although the exact construction methods within this area and habitats affected (as a result of limited survey information at the time of writing this PEIR) are yet to be defined.	Medium	Moderate adverse	Yes
Trumfleet Pond LWS	Medium	The construction of the Grid Connection Corridor for the Scheme is predicted to directly impact upon habitats within this LWS, although the exact construction methods within this area and habitats affected (as a result of limited survey information at the time of writing this PEIR) are yet to be defined.	Medium	Moderate adverse	Yes
Neutral grassland	Medium	Permanent loss of this habitat within the Site.	High	Moderate adverse	Yes
Running water	Medium	The construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible)	Medium	Moderate adverse	Yes

IEF	Sensitivity (Value)	Description of Impact	Magnitude of Impact	Effect Category	Potential for a Significant Effect?
		which in turn will lead to temporary fragmentation of running water, although the exact construction methods are not fully defined.			
Hedgerows	Medium	Construction activities are predicted to result in the potential for the loss of small sections of hedgerow as a result of Grid Connection Cables, fences and access routes. Whilst the extent of any loss of this habitat is currently unknown, the majority of hedgerows across the Site will be avoided and any replanting required has been embedded within the Scheme design for creation of hedgerows. However, it is noted that this may take time to develop.	Medium	Moderate adverse	Yes
Aquatic macro-invertebrates/ macrophytes	Likely importance of Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches and watercourses potentially supporting aquatic macroinvertebrates and macrophytes. However, the construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn will lead to temporary disturbance to aquatic macroinvertebrates and macrophytes, although the exact construction methods are not fully defined.	Low	Minor adverse	No
Fish	Likely importance of Medium	Where de-watering or over-pumping is required within watercourses supporting fish, there is the	Low	Minor adverse	No

IEF	Sensitivity (Value)	Description of Impact	Magnitude of Impact	Effect Category	Potential for a Significant Effect?
		potential for mortality of fish species, although fish rescue would be required to avoid this.			
Terrestrial invertebrates	Likely importance of Low	Construction activities may result in the temporary loss of grassland and marginal habitats of greater importance to terrestrial invertebrates. Whilst the extent of any loss of such habitats of potentially greater value to terrestrial invertebrates is currently unknown, the majority of habitats supporting terrestrial invertebrates across the Site will be avoided and retained. However, it is noted that any temporary habitat loss may take time to develop.	Low	Minor adverse	No
GCN	Likely importance of Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches and watercourses potentially supporting GCN. However, the construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn may lead to temporary disturbance to GCN (if present), although the exact construction methods are not fully defined.	Low	Minor adverse	No
Ground-nesting birds	Likely importance of Low	There will be habitat loss across the Solar PV Site which will lead to the loss of habitat used by ground-nesting birds.	High	Moderate adverse	Yes
Riparian mammals	Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches	Low	Minor adverse	No

IEF	Sensitivity (Value)	Description of Impact	Magnitude of Impact	Effect Category	Potential for a Significant Effect?
		and watercourses potentially supporting riparian mammals. However, the construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn will lead to temporary disturbance to riparian mammals (if present), although the exact construction methods are not fully defined.			

Operation and Maintenance

8.12.5 The evaluation has identified that during the operation and maintenance of the Scheme the following potential impacts on IEFs have been taken forward for further assessment:

a. Disturbance to fish from EMF arsing from buried cables; and

b. Displacement of foraging/commuting bats by the presence of Solar PV Panels.

8.12.6 Table 8-15 summarises the preliminary sensitivity (value) of IEFs, impacts and effects resulting from operation and maintenance of the Scheme that are predicted at this stage. These will be further defined by ongoing ecological surveys which will be used to reduce or remove the magnitude of impacts and potential for significant effects.

8.12.7

Table 8-14: Summary of Magnitude of Operation and Maintenance Impact and Significance of Effect

IEF	Sensitivity (Value)	Description of Impact	Magnitude of Impact	Effect Category	Potential for a Significant Effect?
Fish	Likely importance of Medium	There are potential effects on fish to EMF from cables buried beneath watercourses, which could impede movement and disrupt feeding behaviour. As the depth of the cable is expected to be 1.5 m beneath the bed of any watercourse, there is the potential for effects of EMF during operation and maintenance of the Scheme, but the potential for these to occur will be determined following further survey and characterisation of the fish populations in relevant watercourses.	Medium	Moderate adverse	Yes
Bats	Medium	Informed by detailed bat surveys (see **PEIR Volume III Appendix 8-4**: **Bat Survey Report**) identifying important areas for foraging and commuting bats and taking into account embedded mitigation measures set out in Section 8.10 and a Scheme design which sets back the Solar PV Panels from all important habitats used by foraging bats, i.e. hedgerows and woodlands, the findings from research at small operational solar sites are not considered comparable with the careful design configuration of the Scheme. As such, no adverse effect on the overall bat populations present within the Site or integrity of any particular bat species population is predicted.	Low	Negligible	No

Decommissioning

8.12.8 The effects of decommissioning of the Scheme are likely to be similar to those for construction, but with recognition that many of the potential impacts associated with the construction of the Scheme, such as building of infrastructure, e.g. substation and laying of cables, will not be relevant during decommissioning. Therefore, the effects summarised in Table 8-13, also apply to decommissioning. Habitats and protected or notable species are likely to be subject to temporary damage of habitats and disturbance to species during decommissioning activities. Therefore, appropriate measures will need to be put in place to minimise degradation of habitats and disturbance of species, appropriate to the legislative and policy requirements at the time of decommissioning. It is reasonable to assume that measures included within the Framework DEMP will to control this.

8.12.9 Taking into account that relevant legislation and policy will need to be adhered to when decommissioning takes place, appropriate measures will be put in place to monitor and manage the impact of decommissioning activities on IEFs. A final DEMP, as secured via a requirement of the DCO, will be produced prior to decommissioning.

8.13 Additional Mitigation and Enhancement Measures

8.13.1 Surveys for ecology are ongoing and at this stage, it is not confirmed (in the absence of full survey data) the extent of any additional mitigation required (including whether any additional mitigation measure are needed at all) over and above the embedded and standard environmental protection measures as set out in Section 8.10. However, the potential for significant effects on IEFs has been identified in Table 8-13 and the Scheme will seek measures to reduce the potential significance of these effects. EIA is an iterative process, and should further mitigation be identified, e.g. if further ecological surveys determine other impacts, then the Scheme design will look to mitigate these wherever possible. These mitigations will be clearly distinguished in the DCO submission from the enhancements, e.g. habitat creations and improvements proposed to deliver the required net gains in biodiversity.

8.13.2 In line with the forthcoming mandatory requirements for BNG in relation to NSIPs and in acknowledge of NPS EN-1, the Scheme will seek to deliver significant gains for biodiversity in line with national and regional policies and biodiversity priorities. These gains and further enhancements will also be based on consultation responses as the Scheme progresses. A robust monitoring programme will also be defined in the DCO submission to ensure that required mitigation biodiversity net gains and further enhancement measures are delivered successfully and to implement any remediation as required.

8.13.3 Habitat creation and enhancements have been included within the Scheme design to increase the biodiversity of the Scheme. Whilst a number of these will minimise the landscape and visual impacts, these will also provide landscape-scale benefits for biodiversity through the increase in habitat availability and connectivity for a wide range of fauna.

8.13.4 Vegetation would be established through natural regeneration or in the case of grasslands from seed collection from the grasslands identified within the Site Boundary and through a suitable long-term habitat management regime. Consideration will be paid to microclimatic conditions when identifying appropriate species. Management will be undertaken in a variety of ways to ensure maximum biodiversity gains, with grassland managed by either low intensity grazing or infrequent hay cutting to allow plant species to flower and seed.

8.14 Residual Effects

8.14.1 A preliminary assessment of effects to ecological receptors as a consequence of the Scheme has been undertaken and identified the potential for significant effects to ecological features.

8.14.2 Ecological surveys are ongoing, so the preliminary assessment presented in this chapter has been undertaken based on the ecological data available at the time of writing, consisting of the sources set out in Table 8-3 and where necessary, professional judgement and using a precautionary basis. However, it is expected that the implementation of appropriate mitigation measures will reduce the magnitude of impact identified and the significance of effects won't exceed that presented in Table 8-11 and Table 8-13.

8.14.3 With the implementation of the enhancements the Scheme has the potential to generate beneficial effects for a number of the IEFs identified in Table 8-10. Further details on beneficial effects will be presented in the ES, once the baseline conditions are fully defined and enhancement measures fully established. However, it is anticipated that wide scale benefits will be delivered to IEFs occurring in both aquatic and terrestrial habitats from the cessation of farming practices including agricultural chemical inputs to watercourses and pesticide use on crops, as well as the extensive creation of grassland habitats and positive management of existing boundary features. These beneficial effects will be explored further in the ES, submitted with the DCO application.

8.15 Cumulative Effects

8.15.1 This section assesses the potential effects of the Scheme in combination with the potential effects of other proposed and committed plans and projects including other developments (referred to as 'cumulative developments') within the surrounding area.

8.15.2 The cumulative developments to be considered in combination with the Scheme have been prepared and shared with City of Doncaster Council, North Yorkshire Council and East Riding of Yorkshire Council and are listed in **PEIR Volume I Chapter 15: Cumulative Effects and Interactions** and presented in **PEIR Volume II Figure 15-3: Location of Short List Schemes**. The assessment has been made with reference to the methodology and guidance set out in **PEIR Volume I Chapter 5: Environmental Impact Assessment Methodology**.

8.15.3 This preliminary cumulative effect assessment has identified, for each receptor, the areas where the predicted effects of the Scheme could interact

with effects arising from other plans and/or projects on the same receptor based on a spatial and/or temporal basis.

8.15.4 Surveys to fully characterise the ecological baseline are still ongoing and so the preliminary assessment presented in this chapter of the PEIR has been undertaken based on the ecological data available at the time of writing, consisting of the sources set out in Section 8.4 and, where necessary, professional judgement and using a precautionary basis. However, it is expected that with further refinement of the ecological baseline and the subsequent implementation of appropriate mitigation measures that the magnitude of the Scheme's impacts and the significance of effects presented in Table 8-13 and Table 8-14 will reduce further, minimising the potential cumulative effects considered in the ES.

8.15.5 At this preliminary assessment stage, based on an initial review of the short list of developments, due to their nature, spatial extent and distance from the Scheme, no plans or projects identified in **PEIR Volume I Chapter 15: Cumulative Effects and Interactions** are considered in combination to impact the important ecological features identified in this assessment. Further, it is expected that all of the cumulative developments included in this preliminary assessment will implement suitable mitigation measures in line with relevant legislative and policy requirements and best practice. Therefore, the potential for impacts to the important ecological features during the construction, operation and maintenance, and decommissioning phases of the Scheme are considered within the Site Boundary. Other developments are not likely to contribute to the effects on the important ecological features identified in this chapter and therefore the effects are not significant. A summary of this preliminary assessment is provided in Table 8-15 and Table 8-16.

Table 8-15: Ecology Cumulative Effects Assessment– Construction and Decommissioning Phase

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
Wrancarr Drain and Braithwaite Delves LWS, Trumfleet Pit LWS and Trumfleet Pond LWS	Medium	The construction of the Grid Connection Corridor for the Scheme has the potential to directly impact upon habitats within this LWS, although the exact construction methods within this area and the potential for habitats to be affected (as a result of limited survey information at the time of writing this PEIR) are yet to be defined.	Moderate Adverse	2, 4, 7, 8, 10, 12, 42	None of the cumulative developments are considered to have the potential for adverse effects with the Scheme on the LWS during the construction and decommissioning phases due to their distance and absence of interactions with these LWS. Where cumulative developments are yet to assess their impacts and there is currently no information available regarding mitigation, it is	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
					reasonable to assume that these developments will provide suitable good industry practice measures to reduce or offset impacts, in adherence with legislation and policy.		
Neutral grassland	Medium	Permanent loss of this habitat within the Site.	Moderate Adverse	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of neutral grassland within the Scheme and absence of interactions with this habitat type, none of the cumulative developments are considered to have the potential for adverse effects on neutral grassland	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
					with the Scheme during construction and decommissioning phases. The potential for impacts on this habitat type is only considered within the Scheme Boundary.		
Running water	Medium	The construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn will lead to temporary fragmentation of running water, although the exact construction	Moderate Adverse	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of running water applicable to the Scheme and absence of interactions with this habitat type, none of the cumulative developments are considered to have the potential for adverse effects on running water with	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		methods are not fully defined.			the Scheme during the construction and decommissioning phases. The potential for impacts is only considered within the Scheme Boundary.		
Hedgerows	Medium	Construction activities are predicted to result in the potential for the loss of small sections of hedgerow as a result of the Grid Connection Cables, fences and access routes. Whilst the extent of any loss of this habitat is not yet fully defined, the majority of	Moderate Adverse	2, 4, 7, 8, 10, 12, 42	Whilst individually the cumulative developments may have localised effects on small sections of hedgerows specific to their development area, there is no spatial overlap in the hedgerow resource, with cumulative developments mitigating any loss,	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		hedgerows across the Site will be avoided, with those temporarily removed for construction purposes re-instated following completion of construction. In addition, embedded within the Scheme design is the creation of a network of new hedgerows. Whilst it is acknowledged that these will take time to develop, once established the overall hedgerow resource will be greater than is currently present.			where appropriate. As such, none of the cumulative developments are considered to have the potential for adverse effects on hedgerows with the Scheme during the construction and decommissioning phases. The potential for impacts is only considered within the Site Boundary.		

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
Aquatic macro-invertebrates / macrophytes	Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches and watercourses potentially supporting aquatic macroinvertebrates and macrophytes. However, the construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn will lead to temporary disturbance to aquatic macroinvertebrates	Minor adverse	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of aquatic habitat within the Scheme supporting aquatic macroinvertebrates and macrophytes and the absence of interactions with these habitat types, none of the cumulative developments are considered to have the potential for adverse effects on aquatic macro-invertebrates and macrophytes with the Scheme the construction and decommissioning phases. The potential for impacts is only	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		and macrophytes, although the exact construction methods are not fully defined.			considered within the Site Boundary.		
Fish	Medium	Where de-watering or over-pumping is required within watercourses supporting fish, there is the potential for mortality of fish species, although fish rescue would be required to avoid this.	Minor adverse	2, 4, 7, 8, 10, 12, 42	The nature of any impacts to fish from the Scheme are likely to be localised to specific areas of aquatic habitat (e.g. a section of ditch and drain). Due to their distance from these localised areas of aquatic habitat within the Scheme where impacts to fish may arise and the absence of interactions with these specific areas of habitat,	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
					none of the cumulative developments are considered to have the potential for adverse effects on fish with the Scheme during the construction and decommissioning phases.		
Terrestrial Invertebrates	Low	Construction activities may result in the temporary loss of grassland and marginal habitats of greater importance to terrestrial invertebrates. Whilst the extent of any loss of such habitats of potentially greater value to terrestrial	Minor adverse	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of habitat within the Scheme likely to support notable terrestrial invertebrates and the absence of interactions with these habitat types, none of the cumulative developments are considered to have the potential for	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		invertebrates is currently unknown, the majority of habitats supporting terrestrial invertebrates across the Site will be avoided and retained. However, it is noted that any temporary habitat loss may take time to develop.			adverse effects on terrestrial invertebrates with the Scheme during the construction and decommissioning phases. The potential for impacts is only considered within the Scheme Boundary.		
Great Crested Newt	Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches and watercourses potentially supporting GCN. However, the construction of the Scheme is	Minor adverse	2, 4, 7, 8, 10, 12, 42	None of the cumulative developments are considered to have the potential for adverse effects on Great Crested Newt with the Scheme during the construction and decommissioning phases. The potential for	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn may lead to temporary disturbance to GCN (if present), although the exact construction methods are not fully defined. The Applicant is currently engaging with Natural England to mitigate impacts on GCN through DLL. However, as this assessment is preliminary at this stage, in order to consider the worst-case scenario,			impacts is only considered within the Site Boundary.		

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		impacts to GCN are considered here in the absence of DLL.					
Ground-nesting birds	Low	There will be habitat loss across the Solar PV Site which will lead to the loss of habitat used by ground-nesting birds.	Moderate adverse	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of habitat within the Scheme likely to support notable ground-nesting and the absence of interactions with these habitat types, none of the cumulative developments are considered to have the potential for adverse effects on ground-nesting birds with the Scheme during the construction and decommissioning phases. In	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
					addition, where cumulative developments are predicted to have adverse effects on the same ground-nesting bird species, appropriate mitigation measures are included to ensure no significant residual effect.		
Riparian mammals	Low	The Scheme design has embedded mitigation measures to avoid and buffer the majority of ditches and watercourses potentially supporting riparian mammals. However, the	Minor adverse	2, 4, 7, 8, 10, 12, 42	The nature of any impacts to riparian mammals from the Scheme are likely to be localised to specific areas of aquatic habitat (e.g. a section of ditch and drain). Due to their distance from these localised	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		construction of the Scheme is predicted to temporarily impact upon running water habitats (where non-intrusive crossings are not possible) which in turn will lead to temporary disturbance to riparian mammals (if present), although the exact construction methods are not fully defined.			areas of aquatic habitat within the Scheme where impacts to riparian mammals may arise and the absence of interactions with these specific areas of habitat, none of the cumulative developments are considered to have the potential for adverse effects on riparian mammals with the Scheme during the construction and decommissioning phases. The potential for impacts is only considered within the Site Boundary.		

Table 8-16: Ecology Cumulative Effects Assessment – Operation and Maintenance Phase

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
Fish	Medium	There is the potential that EMF generated from buried cables beneath watercourses, could impede movement and disrupt feeding behaviour of fish species. The depth of the cables is expected to be 1.5 m beneath the bed of any watercourse, however, the presence of sensitive fish species in potentially affected watercourses will be determined by ongoing surveys, and where necessary, the	Moderate Adverse	2, 4, 7, 8, 10, 12, 42	The nature of any impacts to fish from the Scheme are likely to be localised to specific areas of aquatic habitat (e.g. a section of ditch and drain). Due to their distance from these localised areas of aquatic habitat within the Scheme where impacts to fish may arise and the absence of interactions with these specific areas of habitat, none of the cumulative developments	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		buried cable depth potentially increased to 5 m to minimise the potential effects of EMF.			are considered to have the potential for adverse effects on fish with the Scheme during the operation and maintenance phase.		
Bats	Medium	Informed by detailed bat surveys (see **PEIR Volume III Appendix 8-4**: **Baseline Report for bats**) identifying important areas for foraging and commuting bats and taking into account embedded mitigation measures set out in Section 8.10 and a Scheme design	Negligible	2, 4, 7, 8, 10, 12, 42	Due to their distance from areas of habitat within the Scheme likely to be important to bats and the absence of interactions with these habitat types, none of the cumulative developments are considered to have the potential for adverse effects	Negligible	No

Important Ecological Feature	Importance (value)	Description of the Potential Impact from the Scheme	Preliminary Residual Effect Category	Scheme ID	Description of Cumulative Impact	Preliminary Residual Cumulative Effect Category	Preliminary Cumulative Effect (Yes/No)
		which sets back Solar PV Panels from all important habitats used by foraging bats, i.e. hedgerows and woodlands, the findings from research at small operational solar sites are not considered comparable with the careful design configuration of the Scheme. As such, no adverse effect on the overall bat populations present within the Site or integrity of any particular bat species population is predicted.			on bats with the Scheme during the operation and maintenance phase. The potential for impacts is only considered within the Site Boundary.		

8.16 References

Ref. 8-1 His Majesty's Stationary Office (HMSO) (1981). Wildlife and Countryside Act 1981 (as amended). Available at: https://www.legislation.gov.uk/ukpga/1981/69. [Accessed 14 December 2023].

Ref. 8-2 European Council (EC) (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available at: https://www.legislation.gov.uk/eudr/1992/43/contents. [Accessed 14 December 2023].

Ref. 8-3 EC (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version). [Accessed 14 December 2023].

Ref. 8-4 EC (2014). Regulation (EU) 1143/2014 (2014) on the prevention and management of the introduction and spread of invasive alien species (the IAS Regulation). Available at: https://www.legislation.gov.uk/eur/2014/1143/introduction. [Accessed 14 December 2023].

Ref. 8-5 Ramsar Convention (1971). Ramsar, Iran

Ref. 8-6 HMSO (2021). The Environment Act. Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted. [Accessed 14 December 2023].

Ref. 8-7 HMSO (2018). Conservation of Habitats and Species Regulations 2017. Available at: http://www.legislation.gov.uk/uksi/2017/1012/contents/made. [Accessed 14 December 2023].

Ref. 8-8 HMSO (2000). Countryside and Rights of Way Act 2000. Available at: https://www.legislation.gov.uk/ukpga/2000/37/contents. [Accessed 14 December 2023].

Ref. 8-9 HMSO (2006). The Natural Environment and Rural Communities Act. Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents. [Accessed 14 December 2023].

Ref. 8-10 HMSO (1992). Protection of Badgers Act 1992. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents. [Accessed 14 December 2023].

Ref. 8-11 HMSO (1997). Hedgerows Regulations 1997. Available at: http://www.legislation.gov.uk/uksi/1997/1160/contents/made. [Accessed 14 December 2023].

Ref. 8-12 HMSO (2019). The Invasive Alien Species (Enforcement and Permitting) Order 2019. Available at: https://www.legislation.gov.uk/uksi/2019/527/made. [Accessed 14 December 2023].

Ref. 8-13 HMSO (2006). Animal Welfare Act 2006. Available at: https://www.legislation.gov.uk/ukpga/2006/45/contents. [Accessed 14 December 2023].

Ref. 8-14 HMSO (1975). The Salmon and Freshwater Fisheries Act 1975. Available at: https://www.legislation.gov.uk/ukpga/1975/51/contents. [Accessed 14 December 2023].

Ref. 8-15 HMSO (2009). The Eels (England and Wales) Regulations 2009 (SI 2009/3344). Available at: https://www.legislation.gov.uk/uksi/2009/3344. [Accessed 14 December 2023].

Ref. 8-16 HMSO (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations. Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made. [Accessed 14 December 2023].

Ref. 8-17 Department for Energy Security and Net Zero (DESNZ) (November 2023). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/media/65a7864e96a5ec0013731a93/overarching-nps-for-energy-en1.pdf. [Accessed 14 December 2023].

Ref. 8-18 DESNZ (November 2023). NPS for Renewable Energy Infrastructure (EN-3). Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3. [Accessed 14 December 2023].

Ref. 8-19 DESNZ (November 2023). NPS for Electricity Networks Infrastructure (EN-5). Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5. [Accessed 14 December 2023].

Ref. 8-20 Department for Levelling Up, Housing and Communities (December 2023). National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2. [Accessed 15 January 2024].

Ref. 8-21 City of Doncaster Council (2021). Doncaster Local Plan 2015 – 2035. Available at: https://www.doncaster.gov.uk/services/planning/local-plan. [Accessed 15 January 2024].

Ref. 8-22 Doncaster Council (2014). The Doncaster Green Infrastructure Strategy 2014-2028 (adoption version April 2014). [online]. Available at: https://doncaster.moderngov.co.uk/Data/Cabinet/201404301000/Agenda/3000414%20Cab%20r6%20GIS%20App3.pdf. [Accessed 15 January 2024].

Ref. 8-23 Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. CIEEM, Winchester.

Ref. 8-24 Department for Environment, Food and Rural Affairs (DEFRA) (2023). The Environmental Improvement Plan 2023. Available at: https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64fffa/environmental-improvement-plan-2023.pdf. [Accessed 15 January 2024].

Ref. 8-25 Natural England and the DEFRA (2016). Protected species: how to review planning applications. Available at: https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications. [Accessed 15 January 2024].

Ref. 8-26 HMSO (1994). Biodiversity Action Plan. Available at: https://assets.publishing.service.gov.uk/media/5a7ced59ed915d2017106d17/2428.pdf. [Accessed 15 January 2024].

Ref. 8-27 UK Post-2010 Biodiversity Framework. Joint Nature Conservation Committee (JNCC) and DEFRA (2012). Available at: https://hub.jncc.gov.uk/assets/587024ff-864f-4d1d-a669-f38cb448abdc. [Accessed 15 January 2024].

Ref. 8-28 City of Doncaster Council (2007). A Species Audit of Doncaster Borough Doncaster Local Biodiversity Action Plan 2007. Available at: https://dmbcwebstolive01.blob.core.windows.net/media/Default/Planning/Documents/Natural%20Environment/Biodiversity/Species/Species%20Audit.pdf. [Accessed 15 January 2024].

Ref. 8-29 The International Union for Conservation of Nature (IUCN) (2024). The IUCN Red List of Threatened Species. Available at: https://www.iucnredlist.org/en. [Accessed 15 January 2024].

Ref. 8-30 Bennun, L. van Bochove, J. Ng, C. Fletcher, C. Wilson, D. Phair, N. Carbone, G. (2021). Mitigating biodiversity impacts associated with solar and wind energy development. Guidelines for project developers. Gland, Switzerland: IUCN and Cambridge, UK: The Biodiversity Consultancy.

Ref. 8-31 Natural England (2016). Evidence review of the impact of solar farms on birds, bats and general ecology 2016 (NEER012). Manchester Metropolitan University, Manchester. Available at: https://publications.naturalengland.org.uk/publication/6384664523046912. [Accessed 15 January 2024].

Ref. 8-32 Natural England (2011). Natural England Technical Information Note TIN101 Solar parks: Maximising Environmental Benefits. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20150902172007/http://publications.naturalengland.org.uk/publication/32027. [Accessed 15 January 2024].

Ref. 8-33 Planning Inspectorate website (2022). Sunnica Energy Farm, Appendix C: Review of impact of Sunnica Energy Farm on aquatic invertebrates. [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010106/EN010106-004245-8.08%20 Applicant%27 s%20 Response%20 to%20 ExA%20 First%20 Written%20 Questions%20-%20 Appendices%20 A-M.pdf. [Accessed 13 March 2024]

Ref. 8-34 Ramsar Sites Information Service [online], Available at: https://rsis.ramsar.org/. [Accessed 15 January 2024].

Ref. 8-35 Natural England (2023). Designated Sites View. [online]. Available at: https://designatedsites.naturalengland.org.uk/. [Accessed 15 January 2024].

Ref. 8-36 JNCC website: https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/. [Accessed 15 January 2024].

Ref. 8-37 Defra, Multi-Agency geographical information for the countryside (MAGIC) map. Available at: https://magic.defra.gov.uk/MagicMap.aspx. [Accessed 15 January 2024].

Ref. 8-38 Natural England (2023): Ancient Woodland (England) inventory [online]. Available at: https://naturalengland-defra.opendata.arcgis.com/datasets/ancient-woodland-england/explore. [Accessed 15 January 2024].

Ref. 8-39 Woodland Trust Ancient Tree Inventory. [online]. Available at: https://ati.woodlandtrust.org.uk/. [Accessed 15 January 2024].

Ref. 8-40 NBN Atlas: https://nbnatlas.org/. [Accessed 15 January 2024].

Ref. 8-41 Environment Agency (EA) Ecology and Fish Data Explorer website. [online] https://environment.data.gov.uk/ecology/explorer/. [Accessed 14 December 2023].

Ref. 8-42 DEFRA and EA (2023). Explore catchment data. Available at: https://environment.data.gov.uk/catchment-planning/. [Accessed 14 December 2023].

Ref. 8-43 JNCC (2010). Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough. Available at: https://hub.jncc.gov.uk/assets/9578d07b-e018-4c66-9c1b-47110f14df2a. [Accessed 14 December 2023].

Ref. 8-44 Dines, T.D. Jones, R.A. Leach, S.J. McKean, D.R. Pearman, D.A. Preston, C.D. Rumsey, F.J. and Taylor, I. (2005). The Vascular Plant Red Data List for Great Britain. JNCC, Peterborough.

Ref. 8-45 Stroh, P.A. Leach, S.J. August, T.A. Walker, K.J. Pearman, D.A. Rumsey, F.J. Harrower, C.A. Fay, M.F. Martin, J.P. Pankhurst, T. Preston, C.D. and Taylor, I. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

Ref. 8-46 UKHab Ltd (2023). UK Habitat Classification Version 2.0 (www.ukhab.org)

Ref. 8-47 DEFRA (2007). Hedgerow Survey Handbook: A standard procedure for local surveys in the UK (2nd edition). Available at: https://www.hedgelink.org.uk/cms/cms_content/files/89_hedgerow-survey-handbook.pdf. [Accessed 15 January 2024].

Ref. 8-48 EA (2017). Freshwater macro-invertebrate sampling in rivers Operational Instruction 018_08. Environment Agency, Bristol, UK

Ref. 8-49 EA (2002). A guide to monitoring the ecological quality of ponds and canals using Predictive System for Multimetrics (PSYM). Available at: https://freshwaterhabitats.org.uk/wp-content/uploads/2013/09/NPMN_PSYM_MANUAL_July09.pdf. [Accessed 14 December 2023]

Ref. 8-50 Oldham, R.S. Keeble, J. Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the Suitability of Habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal, Vol. 10, pp. 143-155.

Ref. 8-51 Biggs, J. Ewald N. Valentini, A. Gaboriaud C. Griffiths, R.A. Foster, J. Wilkinson, J. Arnett, A. Williams, P. and Dunn, F. 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

Ref. 8-52 English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

Ref. 8-53 Natural England (2004). An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt. Available at: http://publications.naturalengland.org.uk/publication/134002. [Accessed 14 December 2023].

Ref. 8-54 Froglife (1999) Froglife Advice Sheet 10: Reptile survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife, London.

Ref. 8-55 Natural England (2022). Reptiles: surveys and mitigation for development projects.

Ref. 8-56 Gilbert G. Gibbons D.W. and Evans J. (1998) Bird Monitoring Methods: A manual of techniques for key UK species. RSPB, Bedfordshire.

Ref. 8-57 Bibby, C.J. Burgess, N.D. and Hill, D.A. (1992) Bird Census Techniques. The University Press, Cambridge.

Ref. 8-58 Collins, J (ed.) (2023) Bat Surveys for Professional Ecologists Good Practice Guidelines 4th edition

Ref. 8-59 Collins, J (ed.) (2016) Bat Surveys for Professional Ecologists Good Practice Guidelines 3rd edition

Ref. 8-60 Strachan, R. Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. Third Edition. WildCRU, University of Oxford.

Ref. 8-61 Dean, M. Strachan, R. Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Matthews, F. and Chanin, P. The Mammal Society, London

Ref. 8-62 RSPB, NRA and RSNC (1994). The New Rivers and Wildlife Handbook. RSPB.

Ref. 8-63 EA (2011). Fifth otter survey of England 2009 – 2010.

Ref. 8-64 Chanin, P. (2003). Ecology of European Otter. Conserving Natura 2000 Rivers Ecology Series No.10 English Nature.

Ref. 8-65 Harris, S. Cresswell, P, and Jefferies D (1989). Surveying Badgers

Ref. 8-66 Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1.

Ref. 8-67 Gurnell et al. (2019). The MoRPh Survey: a Modular River Physical Survey Field Guide.

Ref. 8-68 Gurnell et al. (2020). A guide to assessing River Condition Part of the Rivers and Streams Component of the Biodiversity Net Gain Metric.

Ref. 8-69 DEFRA (2023). The Statutory Biodiversity Metric User Guide (draft). [online]. Available at: https://assets.publishing.service.gov.uk/media/65673fee750074000d1dee31/The_Statutory_Biodiversity_Metric_-_Draft_User_Guide.pdf. [Accessed 15 January 2024].

Ref. 8-70 Baker, J. Hoskin, R. and Butterworth, T. (2019). Biodiversity Net Gain – Good Practice Principles for development, A practical guide. [Accessed 14 December 2023].

Ref. 8-71 DEFRA and EA (2023). Explore catchment data: Went from Blowell Drain to the River Don Water Body. [online]. Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB104027064260. [Accessed 14 December 2023].

Ref. 8-72 People's Trust for Endangered Species: Otter. [online].

Ref. 8-73 IUCN (2023). The IUCN Red List of Threatened Species. Version 2022-2.

Ref. 8-74 British Standards Institute (2012). BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations

Ref. 8-75 DEFRA (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

Ref. 8-76 Bat Conservation Trust and Institution of Lighting Professionals (2023) Guidance Note GN08/23 Bats and Artificial Lighting At Night

Ref. 8-77 Harrison, C. Lloyd, H. and Field, C. (2016). Evidence review of the impact of solar farms on birds, bats and general ecology. Manchester Metropolitan University

Ref. 8-78 Montag, H. Parker, G. and Clarkson, T. 2016. The effects of solar farms on local biodiversity: a comparative study. Clarkson and Woods and Wychwood Biodiversity

Ref. 8-79 BSG, 2019. Potential ecological impacts of ground mounted photovoltaic solar panels: An introduction and literature review

Ref. 8-80 Cleve Hill Solar Farm. [online]. [Accessed 14 December 2023]

Ref. 8-81 Tinsley, E. Froidevaux, J.S.P. Zsebők, S. Szabadi, K.L. Jones, G. (2023) Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. J Appl Ecol. 2023;00:1–11.

Ref. 8-82 Barré, K, Baudouin, A. Froidevaux, J.S.P. Chartendrault, V. and Kerbiriou , C. (2022) Insectivorous bats alter their flight and feeding behaviour at ground-mounted solar farms. Journal of Applied Ecology 2023;00:1–12

BUILD | OWN | OPERATE | MAINTAIN

BOOM-POWER.CO.UK