GREEN HILL
SOLAR FARM

# Green Hill Solar Farm

## Preliminary Environmental Information Report

## Chapter 09
## Ecology and Biodiversity

Prepared by: Clarkson & Woods

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PINS reference: EN010170

# Contents

# 9 Ecology and Biodiversity

## 9.1 Introduction

9.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of the Environmental Impact Assessment (EIA) undertaken to date concerning the potential impacts of the Scheme on ecology, during the construction, operational and maintenance and decommissioning phases. The following features will form the basis of the ecological impact assessment process:

- Statutory and non-statutory sites designated for nature conservation at international, national and local levels;
- Habitats and species of principal importance for the conservation of biodiversity; and
- Other legally protected, red-listed or notable species of conservation interest.

9.1.2 This chapter will describe the currently available ecological baseline derived from extensive site and desk-based surveys and assess the possible level of effects likely to arise, together with any avoidance, mitigation and compensation measures likely or capable of being adopted, to reduce these in accordance with nature conservation legislation and planning policy. Proposals for ecological enhancement to contribute to local conservation priorities and achievement of Biodiversity Net Gain (BNG) in line with the Environment Act 2021 and national and local policies will also be presented.

9.1.3 Where scheme designs and details are either not yet known or are incomplete at this stage, either assumptions have been made based on professional judgment, or, if it is not possible to make any assumptions, no attempt at a full assessment has been made. This assessment is an iterative process and will be both expanded and made more specific as survey data is collected and scrutinised, and as designs are further developed. This process will be carried out in conjunction with relevant consultees and third parties as necessary to achieve the most robust outcome.

For more details about the Scheme, refer to **Chapter 4: Scheme Description** of this PEIR.

**Appendices and Figures**

9.1.4 This chapter is supported by the following appendices in **PEIR Volume 3**:

- **Appendix 9.1**: Preliminary Ecological Appraisal and Constraints and Opportunities Plans, Green Hill Solar Farm – Clarkson and Woods, May 2024;
- **Appendix 9.2**: Habitat Survey Maps;
- **Appendix 9.3**: Desk Study Maps;
- **Appendix 9.4**: Consultation Responses;
- **Appendix 9.5:** Summary of Badger Survey Results To Date;
- **Appendix 9.6:** Summary of Bat Survey Results To Date;
- **Appendix 9.7**: Summary of Otter and Water Vole Survey Results To Date;
- **Appendix 9.8**: Summary of Bird Survey Results To Date;
- **Appendix 9.9**: Summary of Arable Weed Survey Results;
- **Appendix 9.10**: Ecological Constraints Plans; and
- **Appendix 9.11**: Confidential Schedule 1 Bird Information.

9.1.5 This chapter is supported by the following tables:

- **Table 9.1**: Summary of Consultation and Responses**;**
- **Table 9.2:** Survey Scope and Surveys Completed to Date**;**

- **Table 9.3:** Designated Sites in Proximity to Green Hill A;
- **Table 9.4:** Designated Sites in Proximity to Green Hill ;
- **Table 9.5:** Designated Sites in Proximity to Green Hill B;
- **Table 9.6:** Designated Sites in Proximity to Green Hill C;
- **Table 9.7:** Designated Sites in Proximity to Green Hill D;
- **Table 9.8:** Designated Sites in Proximity to Green Hill E;
- **Table 9.9:** Designated Sites in Proximity to Green Hill BESS;
- **Table 9.10:** Designated Sites in Proximity to Green Hill F;
- **Table 9.11:** Designated Sites in Proximity to Green Hill G;
- **Table 9.12:** Designated Sites within Cable Route Search Area;
- **Table 9.13:** Habitat Types within the Scheme and their Extent and Importance;
- **Table 9.14:** Summary of Preliminary Ecological Evaluation; and
- **Table 9.15**: Summary of Residual Effects.

## 9.2 Consultation

9.2.1 An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in July 2024, with a formal request for Scoping Opinion. PINS subsequently issued their Scoping Opinion on 30th August 2024. Consultation undertaken throughout the pre-application and scoping phase for the Scheme has informed the approach to the ecology and biodiversity assessment and the information provided within this chapter.

9.2.2 A summary of consultation and response to the Scoping Report are outlined below in **Table 9.1**.

**Table 9.1: Summary of Consultation and Responses**

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| Natural England Discretionary Advice Service.<br><br>Initial Meeting to discuss survey scope.<br><br>16th January 2024 | Confirmation that the proposed survey scope regarding all species groups (except wintering birds associated with the Upper Nene Valley Gravel Pits SPA) was appropriate.<br><br>This allowed implementation of the surveys to the agreed scope. | Agreed survey scope set out in Section 9.4. |
| Natural England Discretionary Advice Service.<br><br>Query re. survey scope to inform the assessment of potential impacts of the Scheme on wintering birds associated with the Upper Nene Valley Gravel Pits SPA.<br><br>February-October 2024 (ongoing). | The survey scope proposed at Green Hill A, B, C, D, E, F and BESS (comprising six diurnal and three nocturnal wintering bird surveys across all Sites within 10km of the SPA) was confirmed as acceptable to inform an impact assessment of the Scheme.<br><br>Two years of wintering bird survey data would not be required, and one year of survey information (as per the scope proposed above) would be sufficient to inform an assessment of potential impacts upon the Upper Nene Valley Gravel Pits SPA.<br><br>At the time of writing, consultation with Natural England regarding the scope of wintering bird surveys across the Scheme is still ongoing due to conflicting advice regarding acceptable wintering bird survey scopes. | Written correspondence provided in Appendix 9.4.<br><br>Proposed survey scope set out in Section 9.4. Full ecological survey scope will be confirmed in the ES Chapter once survey scopes have been finalised (following ongoing consultation with Natural England and other stakeholders). |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 2.1.2 | Summer Leys Local Nature Reserve (LNR) is described as a nature reserve "easily qualifying as a LWS". It is unclear whether this site comprises both an LNR and a Local Wildlife Site (LWS). This should be clarified in the ES. | Summer Leys site is designated as a Local Nature Reserve and Local Wildlife Site. This has been clarified throughout this PEIR Chapter (e.g. **Table 9.8**) |
| The Planning Inspectorate<br>30th August 2024<br>ID 2.1.12 | It is stated that hedgerows on the application site will be managed on a rotational basis to enable wildlife to benefit from them year-round. Details of how this would be managed and where the commitment to it is secured should be included in the ES and cross-reference made to related documents as appropriate. The Inspectorate notes that an Outline Landscape and Ecological Management Plan (LEMP) is proposed to be submitted with the DCO application. | An Outline Landscape and Ecological Management Plan (OLEMP) has been produced at PEIR stage, which outlines how habitats may be managed during the operational phase of the Scheme. A more detailed OLEMP will be submitted with the ES. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.1 | The Inspectorate agrees that hazel dormice can be scoped out of the assessment on the basis that the data search did not return any records within the 2km search area, the habitats are considered sub-optimal and according to the information that hazel dormice rarely occur in Northamptonshire. | N/A |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.2 | The Inspectorate agrees that this matter may be scoped out according to the justification provided that significant effects on terrestrial wildlife from EMFs are highly unlikely due to the burial and sheathing of all of the cables; and the relatively low voltage of the 33kV and 132kV cabling. The Inspectorate notes that it is identified that fish species with sensitivity to EMFs could be subject to disturbance resulting from installation of a 400kV cable and that where it is proposed that any such cables cross watercourses the potential effects of EMF will be considered. | N/A |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.3 | The Inspectorate agrees that impacts on these sites may be scoped out on the basis that they are designated solely for their geological interest, the features of which will be discussed in other relevant ES chapters. | N/A |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.4 | The Inspectorate notes that The Hedgerows Regulations 1997 are included in the list of legislation relevant to the biodiversity and ecology assessments. The baseline information contained within the ES should identify hedgerows within the site according to the above regulations, that may be affected by the Proposed Development. An assessment should be provided where significant effects are likely to occur. | An assessment of hedgerows according to The Hedgerow Regulations 1997 will be included in the ES Chapter. |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.5 | The potential for white-clawed crayfish to be present in watercourses that cross the site should be considered and an assessment provided where significant effects are likely to occur. | Preliminary assessment of significant effects on white-clawed crayfish has been provided in Section 9.8. Full assessment will be provided in ES Chapter. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.6 | It is stated in para 8.3.9 that the desk study and data search outlined in para 8.3.8 included the Cable Route Search Area, although the wording therein largely refers only to the solar array/AD Sites. It is also explained that existing records of protected and notable species within 2km of each Site were obtained from the relevant local records centres and that data is also held for the entirety of the Cable Route Search Area. However, the information on species provided subsequently (from para 8.3.21) largely refers only to the Sites. The baseline information contained within the ES should encompass and clearly describe the baseline for the whole of the application site, including the Cable Corridor. | Designated sites within the current Cable Route Search Area, as well as a preliminary assessment of effects for these designated sites, is provided in 9.8.24 - 9.8.37. ES Chapter will include a full desk study of the Cable Corridor once this has been finalised. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.7 | It is stated that the scope of wintering bird surveys will vary depending on whether the solar array/AD Sites fall within or outside of the 10km consultation zone (considered to be land functionally linked to the Special Protection Area (SPA)) surrounding the Upper Nene Valley Gravel Pits SPA. It is not explained why this is the only criteria that has been applied to determine the scope of such surveys or confirmed that would encompass the need to undertake such surveys in other locations which could be affected by the Proposed Development. However, the Inspectorate notes that wintering bird surveys have been or are scheduled to be undertaken for all of the solar array/AD Sites. The methodology should be clarified in the ES. Para 8.3.17 states that the proposed survey scope was confirmed by Natural England (NE) as acceptable to provide an assessment of the Proposed Development. However, it is unclear whether the Discretionary Advice Service (DAS) response from NE contained in Appendix 8.1 applies to the Cable Corridor, parts of which may be through land functionally linked to the SPA. This should be clarified and evidenced within the ES. | DAS consultation with Natural England (including discussions around wintering bird survey scope) are currently ongoing. All ecological surveys proposed and completed to date are outlined in **Table 9.2**, and will be confirmed in the ES Chapter once survey scopes have been finalised. |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.8 | It is explained that any of Sites B-G and the BESS site that fall within 10km of any part of the Upper Nene Valley Gravel Pits SPA will be subject to nocturnal wintering bird surveys. Site A is excluded on the basis that it lies 11.5km from the SPA and Site A.2 on the basis that only a very small section of its southernmost field lies just within the 10km consultation zone. The Inspectorate notes that NE agreed the approach in relation to Site A and that a response regarding Site A2 (and Site G) is awaited. NE's agreement or otherwise should be evidenced in the ES. | Consultation with Natural England and other stakeholders is ongoing – ecological survey scope (as well as supporting consultation responses) will be documented in the ES Chapter. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.9 | It is stated that the survey scope for the Cable Route Search Area has not yet been finalised and a 'proportionate' survey scope is proposed on the basis that the cable installation works would be of a temporary nature. No breeding bird surveys are proposed for the Cable Corridor on the basis that the cable installation works would be temporary and progress linearly and due to their nature would minimise disturbance to birds. The Inspectorate notes that Table 8.1 provides information only in relation to the solar array/AD Sites and that the DAS response from NE contained in Appendix 8.1 agrees the scope of the surveys, which include breeding bird surveys. It is unclear whether this response applies only to the solar array/AD Sites. Full ecological surveys should be undertaken at locations where LSE could arise. The scope of the ecological surveys for the entire site, including the Cable Corridor, should be agreed with Natural England and other key consultees, such as the relevant Councils, where possible, and the level of agreement should be evidenced in the ES. Cross-reference should be provided to relevant information contained in other application documents such as the Consultation Report. | Consultation with Natural England and other stakeholders is ongoing – ecological survey scope (as well as supporting consultation responses) will be documented in the ES Chapter. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.10 | The Inspectorate notes that horizontal directional drilling (HDD) or opencut trenching may be used for the construction of the Cable Corridor. The ES should identify the technique to be used at the relevant locations and provide details of the programme and the works, including identifying if any night-time working is anticipated. Justification should be set out for use of the preferred technique at the particular locations and identification of potential impacts and an assessment where LSE could occur should be provided. | The ES Chapter will provide details of the construction methodology to be used at each watercourse crossing point, as well as an assessment of potential effects. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.11 | Table 8.2 refers to the designated sites scoped into the assessment and sets out their distance from the solar array/AD Sites. An equivalent table within the ES should also include the same information for the Cable Corridor. It may be clearer for the reader if the nationally and locally designated sites were separated out. | Equivalent table will be provided within the ES Chapter, once the Cable Corridor has been finalised. |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.12 | It is explained that searches for records of protected and priority species within the Cable Route Search Area will be provided once available. This information should be provided with/appended to the ES. | ES Chapter will include a full desk study of the Cable Corridor once this has been finalised. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.13 | The Inspectorate notes that GCN District Level Licensing (DLL) is currently being pursued as a mitigation option for the Proposed Development. The Inspectorate understands that the DLL approach includes strategic area assessment and the identification of risk zones and strategic opportunity area maps. The ES should include information to demonstrate whether the Proposed Development is located within a risk zone for GCN. If the Applicant enters into the DLL scheme, NE will undertake an impact assessment and inform the Applicant whether their scheme is within one of the amber risk zones and therefore whether the Proposed Development is likely to have a significant effect on GCN. The outcome of this assessment will be documented on an Impact Assessment and Conservation Payment Certificate (IACPC). The IACPC can be used to provide additional detail to inform the findings in the ES, including information on the Proposed Development's impact on GCN and the appropriate compensation required.<br><br>It is stated that if DLL is not taken forward the assessment will instead be informed by eDNA survey work of all accessible ponds within the application site and within 250m of any of the Sites or Cable Corridor, where access permission can be obtained. In the event that this option is pursued, the ES should identify any limitations to the information-gathering process and assess the WCS for any areas that cannot be surveyed that are considered to have potential for GCN presence. | N/A |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.14 | It is proposed that reptile surveys are not undertaken given the 'relatively low' risk to individual reptiles during the construction and operational phases due to the majority of suitable habitat being located at the field peripheries; and the size of the Sites. It is stated that potential impacts such as habitat loss/fragmentation and the risk of individuals being killed/injured during the construction phase will be assessed and mitigation proposed. The Inspectorate notes that some common reptile species may be present and that some areas of particularly suitable habitat have been identified within the Sites.<br>It is proposed that invertebrate surveys are not undertaken on the basis of the "relatively low distinctiveness" of the Sites' habitats and the nature of the Proposed Development. The Inspectorate notes that a small number of notable invertebrate species records were returned during the desk study and that habitats within the Sites provide suitable opportunities for a range of species. It is unclear whether these statements also apply to the Cable Corridor Search Area and also how appropriate mitigation can be proposed in the absence of baseline data.<br>In the absence of information such as evidence demonstrating clear agreement with relevant statutory bodies, the Inspectorate is not in a position to agree to scope out reptile and invertebrate surveys. Accordingly, the ES should include such baseline information, including for the Cable Corridor, or evidence demonstrating agreement with the relevant consultation bodies and the absence of a LSE. | Consultation with the local planning authority ecologists and other stakeholders will be undertaken to confirm acceptability of ecological survey scope. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.15 | It is explained that the majority of the diurnal wintering bird surveys started in October 2023 and continued until February 2024 but that, due to its (later) addition to the Proposed Development in December 2023, two additional surveys are scheduled for October and November 2024 at Site F only. This is inconsistent with Table 8.1 which indicates that no surveys have yet been undertaken for Sites G and A.2 and are scheduled to take place between October 2024 and March 2025. The baseline survey information must be consistent within the ES. | All ecological surveys proposed and completed to date are outlined in **Table 9.2**, and will be confirmed in the ES Chapter once survey scopes have been finalised. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.16 | No specific fish surveys are proposed. The Inspectorate notes that the Environment Agency (EA), within its scoping consultation response contained in Appendix 2, highlights the availability of its fish survey data. This should be used to inform the baseline, so that receptors and potential impacts can be identified. | Baseline fish information (including Environment Agency open source fish data) provided in paragraphs 9.6.192 - 9.6.195 |

| Consultee and Date | Comment | Outcome and any further steps anticipated |
|---|---|---|
| The Planning Inspectorate<br>30th August 2024<br>ID 3.3.17 | The Inspectorate notes that Northamptonshire Council is working with NatureSpace to create a district-wide mitigation strategy to address impacts on ground-nesting birds, particularly from solar farms (see Appendix 2 of this Opinion). It is recommended that the Applicant engage with the Council on this matter should LSE on ground-nesting birds be predicted and mitigation and/or compensation measures be required. | Noted – mitigation options for ground nesting birds will be explored and details provided in the ES Chapter. |
| The Planning Inspectorate<br>30th August 2024<br>ID 3.17.1 | The Inspectorate is content that a standalone quantitative lighting assessment can be scoped out on the basis that lighting impacts will be considered in the Landscape and Visual and Ecology chapters of the ES and will include consideration of potential impacts of directional and intermittent lighting and describe mitigation measures as required. This should include impacts of night-time lighting. The Inspectorate notes that an OCEMP and ODEMP will be submitted with the DCO application and will include a lighting strategy intended to minimise light spill to receptors. Cross-reference should be made from the ES to the relevant measures contained within the management plans. | The ES Ecology and Biodiversity Chapter will include an assessment of potential lighting effects on ecological receptors. |

## 9.3 Legislation, Planning Policy and Guidance

9.3.1 This section provides an overview of the legislation, planning policy and guidance against which the Scheme will be considered for ecology and biodiversity.

### Legislation

#### UK Legislation

*The Habitats Directive / The Conservation of Habitats and Species Regulations 2017 (as amended) ('The Habitats Regulations') (Ref.1)*

9.3.2 The Habitats Directive: Adopted by the European Commission (EC) in 1992, Council Directive 92/43/EEC concerning the conservation of natural habitats and wild flora and fauna was transposed into UK legislation through the Conservation Regulations 1994. This has been superseded by the Conservation of Habitats and Species Regulations 2017. Habitats listed under Annex I to the Directive and species listed under Annex II (including otter and some species of bat) receive special legal protection. This is partly implemented through the creation of a network of protected sites (known through Europe as Natura 2000 network of Site of Community Importance) which, in the UK, is made up of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which are designated under the Birds Directive (Directive 79/409/EEC). Under Regulation 48(1) of the Habitats Directive, all developments with the potential to affect a European Site must undergo an assessment, known as an Appropriate Assessment, to determine the potential to cause harm to the features for which the SAC or SPA was designated.

*The Environment Act 2021 (Ref.2)*

9.3.3 This Act is comprised of eight Parts and sets out targets for conservation and environmental betterment along with a system for their implementation, including the creation of a new Office for Environmental Protection (OEP). Of pertinence to ecology is Part 6 – Nature and biodiversity, which includes a mandatory requirement for developments to deliver a minimum 10% biodiversity net gain (as quantified through an approved metric i.e. the Statutory Metric). Such gains must be

secured for a minimum of 30 years post-completion of development. Nationally Significant Infrastructure Projects (NSIPs) will be subject to the requirement to achieve 10% Biodiversity Net Gain, however the mandatory net gain requirement will not be in place until 2025.

*The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref.3)*

*9.3.4* These regulations apply the amended EU directive "on the assessment of the effects of certain public and private projects on the environment".

*The Natural Environment and Rural Communities (NERC) Act 2006 (Ref.4)*

9.3.5 Specifically, the 'Section 41 lists' of Species and Habitats of Principal Importance which are capable of being material consideration within the planning process.

*The Countryside Rights of Way Act 2000 (Ref.5)*

9.3.6 This Act aims to improve public access to the open countryside and nature conservation in England and Wales. It also strengthens protection for Sites of Special Scientific Interest and wildlife crime and provides for better management of Areas of Outstanding Natural Beauty.

*The Hedgerows Regulations 1997 (Ref.6)*

9.3.7 In England and Wales, the Hedgerows Regulations 1997 (as amended) confer a level of protection on hedgerows (though hedgerows within or bordering domestic gardens are excluded), particularly those hedgerows classified as 'Important' under the legislation. The Regulations require those wishing to remove hedgerows to submit a Hedgerow Removal Notice to the Local Planning Authority (LPA), which will then determine whether the hedgerow affected is classified as 'Important' under the Regulations. If it is, the LPA will either approve the proposed hedgerow removal, or issue a retention notice. It is an offence to remove or destroy a hedgerow which is subject to a retention notice, or to remove one without a removal notice.

9.3.8 Routine management of hedgerows, removal of hedgerows for development which has been granted planning consent, and certain other situations are allowed under the Regulations, which also specifically exclude hedgerows within or bordering domestic gardens. Determination of whether a hedgerow should be classified as 'Important' is based on a number of criteria including assessment of its likely historic value (e.g. old parish boundary or part of an ancient monument), ecological value (e.g. presence of protected species, and/or diversity of tree/shrub species in the hedgerow), and landscape value (e.g. associated with a public footpath, or being associated with hedgebanks, ditches, hedgerow trees etc).

*The Protection of Badgers Act 1992 (Ref.7)*

*9.3.9* Badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended) against damage or destruction of a sett, or disturbance, death or injury to the badgers. The Act defines a sett as "any structure or place which displays signs indicating current use by a badger". The definition of current use is subject to considerable debate. Natural England have produced guidance on the definition of current use. (Badgers and Development – A guide to best practice and development, Natural England 2011). Penalties for offences against badgers or their setts include fines of up to £5,000 and/or up to six months in prison.

*The Wildlife and Countryside Act 1981 (as amended) (Ref.8)*

9.3.10 This Act aims to protect wild animals and plants from harm, exploitation, and extinction. The Act was enacted to comply with European and international conventions on wildlife conservation. The Act prohibits certain methods of killing or taking wild animals, especially protected species, and restricts the introduction of non-native animals and plants.

**Planning Policy**

**National Planning Policy**

*Overarching National Policy Statement for Energy (EN-1) (Ref.9)*

9.3.11 Section 4.3 – Environmental Effects/Considerations – This section states that proposals must be accompanied by an Environmental Statement (ES) describing the aspects of the environment

likely to be significantly affected by the project, and sets out that information submitted with the application should be proportionate to the scale of the project.

9.3.12 Section 4.6 – Environmental and Biodiversity Net Gain – This section states that Energy NSIP proposals should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, and the wider environment where possible. Where possible, this should include a completed biodiversity metric calculation. This section also states that applications should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design.

9.3.13 Section 5.4 – Biodiversity and Geological Conservation – This section states that applicants should ensure that the ES clearly sets out any effects on international, national and local designated sites of ecological interest, as well as on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats. It also states that applicants should consider any reasonable opportunities to maximise the restoration, creation and enhancement of wider biodiversity.

*National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref.10)*

9.3.14 Section 2.10 – Solar Photovoltaic Generation – This section sets out potential impacts which are specific to solar PV projects. It lists particular ecological receptors which may need to be assessed in solar applications, including habitats, ground nesting birds, bats and other protected and notable species. It also states that solar farms have the potential to increase the biodiversity value of a site, especially if the land was previously intensively managed, and that this can result in significant benefits and enhancements beyond Biodiversity Net Gain.

*National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref.11)*

9.3.15 Section 2.5 – Environmental and Biodiversity Net Gain – This section recognises that the linear nature of electricity networks infrastructure can provide excellent opportunities to provide green corridors and biodiversity stepping stones, thereby strengthening the connectivity of habitats in the local landscape.

9.3.16 Section 2.9 – Applicant Assessment – This section outlines the information that should be submitted with an application, including the consideration of impacts of Electric and Magnetic Fields (EMFs).

9.3.17 Section 2.11 – Secretary of State Decision Making – This section states that where biodiversity impacts are identified, the Secretary of State should be satisfied that all feasible options for mitigation have been considered and evaluated appropriately.

*The National Planning Policy Framework (NPPF) (Ref.12)*

9.3.18 Published in March 2012 and revised most recently in December 2023. With relevance to Ecology and Biodiversity, Section 15 of the NPPF; paragraphs 180-194, identifies ways in which the planning system should contribute to and enhance the natural and local environment.

*A Green Future: Our 25 Year Plan to Improve the Environment (2018) (Ref.13)*

9.3.19 Sets out the government's plan to tackle environmental issues and effect beneficial change in the next 25 years.

*Natural Environment White Paper – The Natural Choice: Securing the value of nature (2011) (Ref.14)*

9.3.20 This White Paper sets out a series of government commitments to protect and improve the natural environment and develop a green economy.

*Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Ref.15)*

9.3.21 Builds on the Natural Environment White Paper and provides a comprehensive picture of how the government is implementing the country's international and EU commitments.

9.3.22 It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.

*Natural England Biodiversity Net Gain Statutory Metric (and associated documents) (Ref.16)*

9.3.23 The standard metric to assess changes in biodiversity between baseline and post-development, in terms of quantifiable units, for use in England.

*Government Circular: ODPM Circular 06/2005; Defra Circular 01/2005 (2005) Biodiversity and Geological conservation – Statutory obligations and their impact within the planning system. (Ref.17)*

9.3.24 This circular provides administrative guidance on the application of the law relating to planning and nature conservation. It complements the National Planning Policy Framework and the Planning Practice Guidance.

**Local Planning Policy**

*Milton Keynes Council Plan: MK 2016-2031 (adopted March 2019) (Ref.18)*

9.3.25 Section 12 (Environment, Biodiversity and Geodiversity) sets out the Council's policy with respect to these aspects, including expectations regarding development.

*MK City Plan 2050 (not adopted) (Ref.19)*

9.3.26 The MK City Plan 2050 is currently in draft, and a final version is intended to be consulted on in early 2025, with submission to the Secretary of State by the end of June 2025. If and when adopted, this will replace Plan: MK 2016-2031.

*The Plan for the Borough of Wellingborough - Adopted Plan (adopted February 2019) (Ref.19)*

9.3.27 Policy GI (Green Infrastructure) sets out the Borough's policy with respect to green infrastructure, including expectations regarding development.

*North Northamptonshire Joint Core Strategy 2011-2031 (adopted July 2016) (Ref.21)*

9.3.28 Policy 4 (Biodiversity and Geodiversity) sets out the Council's policy with respect to biodiversity, including expectations regarding development.

*West Northamptonshire Joint Core Strategy Local Plan (adopted December 2014) (Ref.22)*

9.3.29 Section 10 (Built and Natural Environment) sets out the Council's policy with respect to these aspects, including expectations regarding development.

*Settlements and Countryside Local Plan for Daventry District 2011-2029 (adopted February 2020) (Ref.23)*

9.3.30 Chapter 9 (The Built and Natural Environment) sets out the District's policy with respect to these aspects, including expectations regarding development.

*Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - August 2015 (Ref.24)*

9.3.31 Provides guidance on assessment of development in the proximity to the Upper Nene Valley Gravel Pits Special Protection Area (SPA), with expectations for the surveys, assessments and mitigation measures.

*Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - Addendum to the SPA SPD: Mitigation Strategy (adopted 2016) (Ref.25)*

9.3.32 Addendum to the Supplementary Planning Document (SPD), with additional detail on the mitigation strategy.

*Northamptonshire Biodiversity Supplementary Planning Document - August 2015 (Ref.26)*

9.3.33 Provides guidance on developments with respect to biodiversity in Northamptonshire.

**Guidance**

*Natural England Standing Advice. Protected species and development: advice for local planning authorities (Ref.27)*

9.3.34 Provides guidance to local planning authorities (LPAs) to assess whether a planning application would harm or disturb a protected species and whether planning permission should be granted on these bases.

*Northamptonshire Biodiversity Action Plan (3rd edition. 2015-2020) (Ref.28)*

9.3.35 Sets out a framework for biodiversity action in Northamptonshire, in terms of species and habitats.

*Chartered Institute of Ecological and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref.29)*

9.3.36 Industry standard guidance for carrying out ecological impact assessments for proposed developments.

*CIEEM Biodiversity Net Gain: Good Practice Principles for Development (Ref.30)*

9.3.37 Provides a set of principles for ensuring biodiversity net gains are appropriately considered and assessed for developments.

*British Standard BS42020:2013 Biodiversity: a Code of Practice for Planning and Development (Ref.31)*

9.3.38 The formal British Standard guide that sets out the expected level of consistency and standards in ecological input to the development planning process from scoping and pre-application stages through to construction management and post construction monitoring.

*British Research Establishment (BRE) (2014). Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene (Ref.32)*

9.3.39 Guidance document that sets out how to incorporate and maximise benefits for biodiversity in solar arrays.

*Solar Energy UK (SEUK) (2022). Natural Capital Best Practice Guidance: Increasing biodiversity at all stages of a solar farm's lifecycle. (Ref.33)*

9.3.40 Provides best practice advice on how to deliver gains for biodiversity, natural capital and other environmental features on solar power developments.

*Natural England (2017). Evidence Review of the Impact of Solar Farms on Birds, Bats and General Ecology (NEER012) 1st Edition (Ref.34)*

9.3.41 Document presenting evidence review on impacts posed by solar farms on various ecological receptors.

*Montag H, Parker G and Clarkson T (2016). The Effect of Solar Farms on Local Biodiversity: A Comparative Study. Clarkson and Woods and Wychwood Biodiversity (Ref.35)*

9.3.42 A study presenting findings from ecological monitoring of operational solar farms and advice on management.

*Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747 (Ref.36)*

9.3.43 Provides an assessment of the conservation status of the UK's birds.

*Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment. In Practice, December 2010. Chartered Institute of Ecology and Environmental Management (Ref.37)*

9.3.44 Provides a review of the evaluation of bats in impact assessment.

*Northamptonshire Biodiversity Records Centre Habitat Opportunity Mapping*

9.3.45 A series of maps identifying opportunities for nature recovery via strategic habitat creation, restoration and enhancement.

## 9.4 Assessment Methodology

9.4.1 The methodologies described in the following section have been developed in line with the relevant planning policy and appropriate industry guidance for assessing the potential impacts of the Scheme on ecology and biodiversity.

### Desk Study Methodology

**Green Hill A to G and BESS**

9.4.2 A desk study exercise was completed for the Scheme in June 2024. This developed on the exercise completed as part of the Preliminary Ecological Appraisal (PEA), accounting for additional sites subsequently brought into the Scheme.

9.4.3 Statutory designated sites for nature conservation and granted European Protected Species licences were identified using the Natural England/DEFRA web-based MAGIC map database (www.MAGIC.gov.uk).

9.4.4 Several Local Environmental Records Centres (LERCs) were also consulted for details of locally-designated and non-statutory sites for nature conservation, as well as records of protected and notable species and habitats. North Northamptonshire's Biodiversity Opportunity Mapping was also obtained. LERCs from which data were gathered included: Northamptonshire Biodiversity Records Centre (NBRC); Bedfordshire and Luton Biodiversity Recording and Monitoring Centre; and Buckinghamshire and Milton Keynes Environmental Records Centre.

9.4.5 The following search criteria were used for designated sites, which formed the Study Area for each Site:

- 'International' designated sites (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites) were searched for within 10km from each Site. This was extended to 30km for any such sites for which migratory birds or bats are listed as a qualifying feature.
- 'National' sites (e.g. Sites of Special Scientific Interest (SSSIs) and Local Nature Reserves (LNRs) were searched for within 5km from each Site.
- 'Local' sites (Such as Local Wildlife Sites (LWSs) and Wildlife Trust Reserves (WTRs)) were searched for within 2km from each Site.

9.4.6 A search for Habitats of Principal Importance (also known as Priority Habitats) within 2km of the Scheme boundary was undertaken using the list of Habitats of Principal Importance in England (Ref.38) and Ancient Woodland Inventory (Ref.39) datasets.

9.4.7 These search radii are typical distances used in ecological impact assessment for projects of this nature and scale and have been selected following the CIEEM guidelines on Ecological Impact Assessment (Ref.29). It is considered unlikely that the proposed development would give rise to impacts on designated sites beyond these ranges.

9.4.8 Figures showing the relationship between the designated sites and the Sites are given in **Volume 3**, **Appendix 9.3**.

9.4.9 For protected and notable species and Priority Habitats, as well as habitat opportunity areas, data were gathered from within 2km of the Sites. Species records data were filtered to exclude records from pre-year 2000, to ensure relevance.

9.4.10 The National Fish Populations Database, held by the Environment Agency (EA) and accessed through the EA's Ecology and Fish Data Explorer, was consulted for freshwater fish monitoring data within 2km of the Sites.

**Cable Route Search Area**

9.4.11 Data pertaining to designated sites, protected and notable species and habitats, and habitat opportunity areas within the Cable Route Search Area were assessed during the desk study exercise using the same sources. Given the temporary and limited nature of impacts associated with the construction of the cable route, and that the Cable Corridor will be refined to a smaller area before the DCO application is made, data pertaining to a search radius around the Cable Route Search Area was not considered proportionate. This desk study exercise was completed in June 2024.

9.4.12 Designated sites within the Cable Route Search Area are identified in figures in **Volume 3**, **Appendix 9.3**.

**Survey Methodology**

**Green Hill A-G and BESS**

9.4.13 A suite of baseline ecological surveys for the Scheme has been undertaken since August 2023 and will continue into 2025. The field survey effort and scope presented in **Table 9.2** below reflects what is believed, at the time of writing, to be appropriate and proportionate to inform the evaluation of baseline conditions for the Scheme based on CIEEM guidance, consultation with stakeholders, and our professional judgment. **Table 9.2** also seeks to address the comments received from the Planning Inspectorate (ID 3.3.15) as outlined in their Scoping Opinion comments, by clarifying the scope of survey work that each Site will be subject to under current proposed survey scopes.

9.4.14 The scope of nocturnal wintering bird surveys will vary depending on whether each of the Sites falls within or outside of the 10km consultation zone surrounding the Upper Nene Valley Gravel Pits SPA. All Sites within 10km of any part of the SPA (comprising Green Hill B-G and BESS) will be subject to the same scope of nocturnal wintering bird surveys.

9.4.15 Green Hill A lies approximately 11.5km to the north-west of the SPA at its closest point, and the majority of Green Hill A.2 lies outside of 10km from the SPA, with only a very small section of the southernmost field lying just within the 10km consultation zone. As a result, Green Hill A and A.2 will not be subject to nocturnal wintering bird surveys, and Natural England have agreed with this approach in principle during NE DAS consultation. However, a full suite of diurnal wintering bird surveys (as well as a full suite of diurnal breeding bird surveys) are still proposed at these Sites.

9.4.16 With the exception of nocturnal wintering bird surveys (as detailed above), all of Sites will be subject to the same survey scope. However, at the time of writing, a lesser degree of survey work has been completed at Green Hill F, G and A.2 in comparison to the other Sites, as these Sites were later additions to the Scheme. Survey effort across all of the Sites will be equalised at the point of submission of the DCO application.

**Table 9.2: Survey Scope and Surveys Completed to Date**

| Survey Type | Methodology | Green Hill A-E & BESS | Green Hill F | Green Hill G | Green Hill A.2 |
|---|---|---|---|---|---|
| Extended UK Habitat Classification (UKHab) Survey and Habitat Condition Assessments | Habitat walkover surveys of all Sites, following UKHab classification methodology (Ref.38). Condition assessments completed as per the Statutory | Completed August 2023 | Completed January 2024 | Completed April 2024 | Completed July 2024 |

| Survey Type | Methodology | Green Hill A-E & BESS | Green Hill F | Green Hill G | Green Hill A.2 |
|---|---|---|---|---|---|
| | Biodiversity Metric User Guide (Ref.16). | | | | |
| Badger Walkover Survey | Walkover survey to search for badger setts or other field signs, conducted in conjunction with above Extended UKHab Survey. | Completed August 2023 | Completed January 2024 | Completed April 2024 | Completed July 2024 |
| Ground Level Tree Assessments for Roosting Bats | Daytime ground level assessments of individual trees and trees associated with hedgerows to assess their suitability to support roosting bats. Follows Bat Conservation Trust Good Practice Guidelines (Ref.41). | Completed August 2023 | Completed January 2024 | Completed April 2024 | Completed July 2024 |
| Building Inspections for Roosting Bats | Daytime building inspections of buildings within Scheme which may be impacted, to search for evidence of roosting bats and nesting birds, and to assess their suitability to support roosting bats. Follows Bat Conservation Trust Good Practice Guidelines (Ref.41). | To be completed prior to submission | To be completed prior to submission | To be completed prior to submission | To be completed prior to submission |
| Automated Bat Activity Surveys | Monthly static bat detector surveys of all Sites utilising a total of 43 detectors between April – October inclusive. | 7 x deployment periods completed between August – October 2023 | 4 x deployment periods completed April-July 2024.<br>Additional deployments | 4 x deployment periods completed April-July 2024.<br>Additional deployments | 2 x deployment periods completed June-July 2024.<br>Additional deployments |

| Survey Type | Methodology | Green Hill A-E & BESS | Green Hill F | Green Hill G | Green Hill A.2 |
|---|---|---|---|---|---|
| | Follows Bat Conservation Trust Good Practice Guidelines (Ref.41). | and April - July 2024 | scheduled August - October 2024 | scheduled August - October 2024 | scheduled August - October 2024 & April - May 2025 |
| Otter and Water Vole Surveys | Spring and autumn walkover surveys of all watercourses and ditches to search for evidence of otters and water voles, and to assess the suitability of these features to support these species. Follows Water Vole Field Signs and Habitat Assessment guidance (Ref.42) and The Water Vole Mitigation Handbook by The Mammal Society (Ref.43). | Completed Autumn 2023 and Spring 2024 | Completed Spring 2024<br>Further survey scheduled for Autumn 2024 | Completed Spring 2024<br>Further survey scheduled for Autumn 2024 | Scheduled Autumn 2024 and Spring 2025 |
| Wintering Bird Surveys (WBS) | 6x diurnal survey visits between October – February on all Sites. Method follows British Trust for Ornithology (BTO) Common Bird Census techniques as informed by http://birdsurveyguidelines.org (Ref.44). | 6 x survey visits completed between October 2023 – February 2024 | 4 x survey visits completed between December 2023 – February 2024. Further survey scheduled for October - December 2024 | None completed to date. Scheduled for October 2024 – March 2025 | None completed to date. Scheduled for October 2024 – March 2025 |
| WBS Nocturnal/ Crepuscular Bird Surveys | Nocturnal bird survey visits (focus on golden plover and lapwing (Ref.45)) of all suitable habitat within the solar array site boundaries (excluding | 3 x surveys completed to date (excluding Green Hill A) between Feb-March 2024. | 3 x surveys completed to date between Feb-March 2024. | None completed to date. Scheduled for October 2024 – March 2025 | No nocturnal/crepuscular bird surveys proposed |

| Survey Type | Methodology | Green Hill A-E & BESS | Green Hill F | Green Hill G | Green Hill A.2 |
|---|---|---|---|---|---|
| | Green Hill A & A.2). Method follows recommendations as informed by nocturnal specific survey guidelines shared by Bird Survey Guidelines (Ref.46) | | | | |
| Breeding Bird Surveys | 6x survey visits between March – August on all Sites. Method follows British Trust for Ornithology (BTO) Common Bird Census techniques (Ref.47).<br>1x additional survey timed shortly before dusk to allow for species that may have varying detectability during this period, such as common quail, barn owl or nightingale. Method same as the breeding bird survey. | 6 x diurnal and 1 x dusk visits completed between March-July 2024 | 6 x diurnal and 1 x dusk visits completed between March-July 2024 | 6 x diurnal and 1 x dusk visits completed between April-August 2024 | 3 x diurnal visits completed between June-August 2024.<br>Additional diurnal and dusk visits scheduled March-May 2025 |
| Modular River Physical Surveys and River Condition Assessments | Modular river physical surveys to be completed on all applicable watercourses to inform Biodiversity Net Gain Assessment. Follows best practice guidance (Ref.48) | None completed to date. Scheduled for Autumn 2024 | None completed to date. Scheduled for Autumn 2024 | None completed to date. Scheduled for Autumn 2024 | None completed to date. Scheduled for Autumn 2024 |
| Arable Weed Surveys | Arable weed surveys completed of all arable fields where agri-environmental schemes were in | Completed July 2024 | Completed July 2024 | Completed July 2024 | Completed July 2024 |

| Survey Type | Methodology | Green Hill A-E & BESS | Green Hill F | Green Hill G | Green Hill A.2 |
|---|---|---|---|---|---|
| | place. Guidance follows Plantlife's Arable Indicator Survey instructions (Ref.51) | | | | |

**Cable Route Search Area**

9.4.17 The Cable Corridor will be assessed in the ES, albeit disturbance will be limited in extent given the narrow width of cable trench required, and the fact that affected land along the cable route will be reinstated following a short construction period. The cable installation works will be temporary and will occur progressively, with operations moving in one direction, thereby minimising the disturbance or incursion into habitats at any one location along the length of the cable route. It is anticipated that works will be carried out via a combination of open cut trenching and Horizontal Directional Drilling (HDD). HDD would likely be employed where ecological features of an increased importance or sensitivity (e.g. main rivers, important hedgerows or Priority Habitats) are to be crossed by the route, and where less impactful routes could not be followed.

9.4.18 The survey scope for the Cable Route Search Area has not yet been finalised, as this will first take into account the habitats that will potentially be affected by the cable works; however, in light of the temporary nature of the cable installation works, the following proportionate survey scope is proposed:

- Extended UK Habitat Classification (UKHab) Survey and desk study of a refined Cable Corridor (estimated to be agreed upon by late 2024). A thorough walkover survey of all accessible land within the Survey Area, and where accessible and relevant up to 30m beyond this, to collect baseline habitat inventory and condition information. The survey will pay close attention to any potential Habitats of Principal Importance or local priorities, including hedgerows. The UKHab standard and protocol will be employed in order to provide a baseline for Biodiversity Net Gain assessments.
- A modular river (physical) survey will be undertaken of all watercourses crossed by the Scheme, primarily to inform Biodiversity Net Gain requirements. The ecological sensitivities of each watercourse will be considered when determining the appropriate cable installation method at each crossing point. Further baseline assessments will be conducted on a case-by-case basis, as determined by the likelihood of impacts.
- A qualitative assessment of habitat suitability for the following species/groups will be undertaken at the same time to identify those which may be at risk from being impacted by proposals, to inform future survey needs:
    - Badgers: badger walkover survey of suitable habitat within Survey Area (setts and signs of activity to be recorded in all accessible habitats).
    - Bats: ground based, daytime inspections of trees and buildings present on or adjacent to the Survey Area for potential roost features and signs of roosting. Assessment of potential value of habitats to foraging and commuting bats.
    - Otters and water voles: the suitability of watercourses in the Survey Area for otters and water voles will be evaluated and spot checks conducted to search for evidence of these species at any watercourse crossing points.
    - Breeding birds: habitats in the Survey Area will be appraised with a particular focus on the likely presence of Ground Nesting Birds such as skylark, yellow wagtail, quail

and grey partridge, as well as Schedule 1 or priority species including barn owl, hobby, peregrine or turtle dove, nightingale, red kite and osprey.

- Terrestrial and aquatic invertebrates: habitats in the Survey Area will be assessed to identify areas of potentially elevated suitability which could be revisited, if necessary, where potential impacts are determined.
- Reptiles: habitats in the Survey Area will be assessed for elevated suitability for reptiles.
- Great crested newt (GCN) District Licensing via NatureSpace Partnership is currently being pursued as a mitigation option for the entire Scheme (including the cable route), which does not require pond survey data to be collected. However, if DL is not pursued as the principal mitigation option, then the ecological impact assessment on GCN will instead be informed by eDNA survey work of all accessible ponds within 250m of the cable route corridor boundaries on third-party land.

9.4.19 The final Cable Corridor would be determined following the completion of these surveys.

9.4.20 Further recommendations may be made following this work either in the design of the Scheme (i.e. micro-siting the cable route working area to avoid potential impacts) or in the implementation of additional mitigation (such as pre-commencement surveys, sensitive seasonal timing of works and the use of Ecological Clerks of Works).

### Impact Assessment Methodology

9.4.21 The standard approach applied in the UK to Ecological Impact Assessment (EcIA) is that developed by the CIEEM in 2018 and revised in 2022. This will be used to evaluate existing conditions, and to assess the significance of likely effects on ecological features that may arise during construction, operation and maintenance, and decommissioning of the Scheme. This involves determining the relative importance of each ecological feature and undertaking an impact assessment pre and post-implementation of mitigation measures. From this, any residual effects likely to occur can be identified along with an appreciation of their significance.

### Sensitivity of Receptors

9.4.22 When evaluating the baseline importance of natural features found on or in proximity to the Scheme, the following characteristics are considered:

- Habitats and species which are irreplaceable, rare or uncommon, either internationally, nationally or more locally.
- Ecosystems and habitats required by important species, populations or species assemblages.
- Species that are afforded legal protection or are the subject of local or regional policy or guidance.
- Priority Species and Habitats under the Natural Environment and Rural Communities (NERC) Act 2006.
- Endemic species or locally distinct sub-populations of a species.
- Species at the edge of their range or that are in decline.
- Species-rich assemblages of plants or animals.
- Habitat diversity, connectivity and/ or other synergistic associations.
- Notably large populations or concentrations of animals considered uncommon or threatened in a wider context.
- Plant communities that are considered to be typical of valued natural/ semi-natural vegetation types.

9.4.23 Taking the above into account, habitats, species and sites identified in the baseline conditions will all be attributed an ecological importance. The importance, or potential importance, of an ecological feature will be described in a geographical context (i.e. International, National, Regional, County, District and Local importance). A category of 'Site' importance will be applied to a feature which is present or potentially present at the site, but where its importance to nature conservation is of relatively low value in the context of the wider landscape. A further 'Negligible' category will be assigned to features of no particular intrinsic nature conservation importance.

9.4.24 In line with the guidelines set out by CIEEM (Ref.29), the impacts of the Scheme will only be assessed on those features with importance equal to, or higher than Local level, or those for which mitigation is required to ensure legal compliance. These features are referred to as Important Ecological Features (IEFs). Non-statutory designated sites will also be identified as IEFs where these lie within the Zone of Influence (ZoI) of the project.

9.4.25 Published selection criteria contained within the selection of biological SSSI can also be referred to aid the assessment of importance. Additionally, where significant habitats, such as Ancient Woodland, do not carry a designation, these are nevertheless considered at a specified geographic level.

**Characterisation of Impacts**

9.4.26 Each potential impact on an IEF will be assessed at its respective geographical scale. Where appropriate, the following parameters will be used in characterising impacts and their effects:

- Positive or negative;
- Magnitude (the size of the impact);
- Extent (area over which impact occurs);
- Duration (time impact expected to last before recovery);
- Reversibility (an impact may be permanent or temporary); and
- Timing and frequency (impact may be seasonal e.g. bird nesting season).

9.4.27 Impacts are described as being short-term, medium-term and long-term. Generally, short-term impacts are taken as those which are not anticipated to persist for longer than three years, medium-term impacts those which persist between four and ten years and long-term impacts are those which are anticipated to persist over a period in excess of ten years. It should be noted that for certain species groups, such as invertebrates, a short-term impact of two years may constitute four generations and as such may be more consistent with a medium-term impact for this species group. Where short, medium or long-term are considered to deviate from the timeframes described above this is highlighted for that particular habitat or species.

9.4.28 When assessing the impact of the development on baseline conditions, predictions will be made which focus solely on the ZoI for each IEF in the context of the lifetime of the development. The ZoI will be assessed separately for each individual feature. Features considered when defining the ZoI of the Scheme on each IEF include the vulnerability of sites and habitats to the effects of construction and operation of the array, the mobility of species both on and surrounding the site, the sensitivity of species to noise and disturbance, the impacts on transient or migratory species and the importance of any particular species or habitats as keystone features within local ecological networks.

**Application of the Mitigation Hierarchy**

9.4.29 The mitigation hierarchy which will be applied during the design of the Scheme follows a stepwise approach of first avoidance, then mitigation and finally compensation of impacts.

9.4.30 Negative impacts can be avoided altogether through fundamental Scheme design choices, such as consideration to which fields to include within the final Scheme design and the extent of the final Scheme boundary. Designed-in avoidance of impacts is termed embedded mitigation within this assessment. Other forms of embedded mitigation measures include any design measures

needed for legal compliance or to implement good practice guidance, for example the use of protective fencing during the construction phase or the adoption of protective buffer zones free of development which ensure offsets from sensitive habitats.

9.4.31 Additional mitigation is any measure required to reduce a certain impact to acceptable levels where embedded mitigation alone is not sufficient. This is likely to take the form of a specific plan or strategy specific to a species, species group or habitat and will be detailed under each relevant IEF's subheading.

9.4.32 Additional mitigation measures are typically given where likely adverse impacts are identified upon the IEFs. The mitigation measures will aim to reduce the overall impact value, typically at the location at which the impact occurs. An assessment of residual effects, which takes account of the proposed additional mitigation, is then made. Due consideration is given to the reliability of mitigation measures and the likelihood that they will achieve their stated goals, using the terms defined above.

9.4.33 Mitigation measures are also identified for species which did not qualify as IEF, but which are afforded legal protection under legislation, and as such will require certain precautionary methodologies to avoid offences being committed.

9.4.34 Compensation measures may be appropriate for IEFs which are likely to experience significant negative effects once mitigation options have been exhausted. Compensation measures seek to offset these residual effects, for example through the provision of alternative habitat either elsewhere within or outside of the Scheme boundary. An examination of the uncertainty in achieving successful compensation will take place. Any remaining residual effects can then be assessed.

9.4.35 Ecological monitoring is likely to form a key role in the success of any proposed mitigation or compensation measures.

9.4.36 Ecological enhancement measures are those which are not expressly required in order to deliver mitigation or compensation but are included to provide further benefits for nature conservation.

**Assessment of Effects and Determining Significance**

9.4.37 The effects of the various identified potential impacts on IEFs will be assessed both prior to and following the application of any additional mitigation measures. 'Residual effects' are those which are predicted to remain once all mitigation has been factored in. In all cases, effects will be expressed in terms of their 'significance'. As CIEEM guidance discourages the use of the matrix approaches to assign categories (e.g. minor, moderate, major) to residual effects, effects will be qualified with reference to the appropriate geographical scale at which the effect is considered to be felt (e.g. "significant at County scale").

9.4.38 Following the methodology described by CIEEM, an ecologically significant effect is defined as *"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".*

## 9.5 Assessment Assumptions and Limitations

9.5.1 This preliminary assessment is based on baseline and scheme design information available at the time of writing this chapter. A full assessment is being undertaken as part of the EIA, the assessment will be developed and refined following statutory consultation and as additional information becomes available, the final assessment presented within the ES.

9.5.2 The baseline conditions are derived from several desk and field-based studies, some of which are complete and others still in progress.

9.5.3 Where the Scheme designs and details are either not yet known or incomplete at this stage, either assumptions have been made based on professional judgment, or, in the event that it is not possible to make any assumptions, no attempt at a full assessment has been made. This

assessment is an iterative process and will be both expanded and made more specific as survey data is collected, analysed and reported on, and designs are further developed. This process will be carried out in conjunction with relevant consultees and third parties as necessary to achieve the most robust outcome.

9.5.4 The methodology for the ecology and biodiversity assessment has considered the following assumptions:

- In lieu of completion of modular river physical surveys, an assumption of the condition of the watercourses at the Sites has been made, based on the preliminary findings from the walkover survey. The assessments will be updated once surveys are completed, prior to submission of the ES.
- In lieu of completion of all breeding bird surveys at Green Hill A.2, and full analysis of data across the other sites, an assumption of the Sites' suitability for breeding birds has been made. This has been informed by preliminary analysis of the findings from surveys completed to date, as well as the habitats found to be present during the extended UKHab walkover surveys. The assessment will be updated once surveys are completed, prior to submission of the ES.
- In lieu of completion of diurnal wintering bird surveys at Green Hill A.2, F and G, an assumption of the Sites' suitability for wintering birds has been made, based on the findings from survey of the other Sites and the habitat context. The assessments will be updated once surveys are completed, prior to submission of the ES.
- In lieu of completion of nocturnal wintering bird surveys at Green Hill G, an assumption of this sites suitability for wintering birds has been made, based on the findings from survey of the other sites and the habitat context. The assessment will be updated once surveys are completed, prior to submission of the ES.
- In lieu of completion of all bat activity surveys at Green Hill A.2, F and G, and full analysis of data across the other sites, an assumption of the sites' suitability for foraging and commuting bats has been made. This is informed by preliminary analysis of the findings from surveys completed to date, and the habitat context. The assessments will be updated once surveys are completed, prior to submission of the ES.
- In lieu of completion of a walkover of the Cable Route Search Area, a desk-based study of the area has been completed, and a framework for appropriate survey to assess the corridor has been developed. The desk study and survey protocol will serve to aid in refinement of the cable route and inform assessment of impacts once surveys are completed, prior to submission of the ES.

## 9.6 Baseline Conditions

9.6.1 This section describes the baseline environmental characteristics for the Scheme and surrounding areas with specific reference to ecology and biodiversity.

### Existing Baseline

9.6.2 The existing baseline conditions are derived from several completed and other partially completed desk and field-based studies, the methodologies of which are provided in **Section 9.4.**

### Study Area

#### Green Hill A-G and BESS

9.6.3 The Sites generally occupy large, open fields on level or gently undulating ground. In the main, fields comprise arable farmland (both cereal and non-cereal crops and grass leys), with narrow uncultivated margins. Wider margins are, however, present at a number of sites, which are largely associated with environmental stewardship agreements. Permanent grassland is rarer and most prevalent at Green Hill E and F. This is managed via sheep or horse grazing, or else cut for silage. Small areas of grassland at field corners are also present. A network of managed hedgerows and ditches lie at the boundaries of the fields.

9.6.4 Woodland and other habitats are rare within the Sites and limited to small plantation shelter belts or else small sections of larger woodland blocks which chiefly lie outside the Site. A number of woodland blocks are situated adjacent, including ancient woodland

9.6.5 In terms of wetland habitats, few ponds are present on site, with a small number a short distance away from field boundaries. Watercourses were recorded adjacent to and intersecting the Sites, including both wet and seasonally wet agricultural ditches. Flowing watercourses are present in the form of upstream feeder streams for more significant local watercourses (predominately the River Nene), in addition to other watercourses managed as agricultural drainage ditches.

**Cable Route Search Area**

9.6.6 At present, the final cable route is yet to be determined however, a Cable Route Search Area has been defined which outlines the area of search for a Cable Corridor. The Cable Route Search Area forms the scope of the ecological desk study at PEIR stage, within which ecological records (notable species and habitats and designated sites) will be searched for. It is understood that only a narrow width within these corridors will be required for the cable route and its construction.

9.6.7 The final location of the Cable Corridor within the Cable Route Search Area will be refined through use of the desk study results, supported by further ecological survey and consideration of responses to statutory consultation, prior to submission of the DCO application. This refinement process is underway but is incomplete. The process will result in a Preferred Cable Corridor being determined after the PEIR submission which will inform the Survey Area for further ecological fieldwork. This corridor will comprise a 50m wide swathe of land, made up of 25m either side of the preferred cable route. The results of surveys will then be used in the next design step, which would be to finely site the cable installation working width within the Preferred Cable Corridor, which will be influenced by the outcome of the further ecological surveys. It is this final route which will be included for submission as the Cable Corridor within the DCO application.

**Designated Sites**

*All Sites*

9.6.8 The Upper Nene Valley Gravel Pits Special Protection Area (Upper Nene Valley GP SPA) comprises a network of exhausted sand and gravel pits extending across approximately 35km of alluvial deposits of the River Nene floodplain. It supports major overwintering bird assemblages with over 20,000 wildfowl and wading birds, including bittern *Botaurus stellaris*, coot *Fulica atra*, several duck species, great crested grebe *Podiceps cristastus*, golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus*. Annex 1 species (under Article 4.1 of Directive 20009/147/EC) include wintering bittern and golden plover. The presence and abundance of overwintering gadwall Anas strepera and mute swan *Cygnus olor* meet additional criteria supporting the identification of Wetlands of International Importance. A 10km consultation zone from the SPA has been defined (Ref.24), within which impacts must be considered.

9.6.9 All sites bar Green Hill A and A.2 fall within the SPA consultation zone. The SPA lies closest to Green Hill BESS (parts of the SPA lie adjacent to the Site boundary).

*Green Hill A*

9.6.10 The Upper Nene Valley GP SPA lies approximately 11.5km to the southeast of Green Hill A at its closest point.

9.6.11 Four SSSIs, four LWSs and one WTR were located within the Study Area of Green Hill A and are listed in **Table 9.3** below.

9.6.12 The SSSIs were designated for their habitats, including open water, diverse pasture, and woodland. Rare plants and invertebrates are known to be present.

9.6.13 The LWSs are similarly designated for grassland and woodland habitats; with a diverse range of plants and invertebrates.

9.6.14 The WTR encapsulates part of the Pitsford Water SSSI, with the chief interest being the wintering and passage waders it supports.

9.6.15 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LWSs/ WTRs).

**Table 9.3: Designated Sites in Proximity to Green Hill A**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Pitsford Reservoir SSSI | 413.06 | Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded. | 1.33km southwest |
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 1.83km southeast |
| Birch Spinney and Mawsley Marsh SSSI | 12.26 | A rare type of ash-maple woodland partly on peat, with flora including blunt-flowered rush, jointed rush and water horsetail. There is also a stretch of a dismantled railway line. | 2km north |
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 3.61km southeast |
| Walgrave East Meadow LWS | 6.11 | A grassy meadow with a good selection of meadow plants and two streams fringed with rush pasture. The site qualifies as a LWS with ten neutral grassland indicator species recorded (one rare). | 0.55km southeast |
| Broughton Green Lane LWS | 2.85 | This site comprises a green lane, which forms a good wildlife corridor, with ancient woodland indicators and diverse range of invertebrates recorded. | 0.65km northeast |
| Old Poors Gorse LWS | 9.65 | A roughly square woodland which covers just over 9.5 hectares. | 0.81km north |
| Highcroft Farm Meadow LWS | 1.44 | A neglected meadow which, although predominately species poor having declined due to lacking appropriate management, hosts an excellent invertebrate assemblage with supporting habitats considered likely to improve through restoration. | 1.04km east |
| Pitsford Water Wildlife Trust Reserve (WTR) | 181.25 | Forms part of Pitsford Reservoir SSSI. Four main streams enter the reserve and form large bays of shallow water across connected valleys. During winter these provide excellent feeding and sheltering areas for wildfowl, whereas lowered water levels in summer expose stretches of mud and foraging areas for migrating waders. | 1.33km southwest |

*Green Hill A.2*

9.6.16 The majority of Green Hill A.2 lies outside of 10km from the Upper Nene Valley Gravel Pits SPA, with only a very small section of the southernmost field lying just within the 10km consultation zone.

9.6.17 Four SSSIs and four LWSs were located within the Study Area of Green Hill A.2 and are listed in **Table 9.4** below.

9.6.18 The SSSIs were designated for their habitats, including open water, diverse pasture, and woodland. Rare plants and invertebrates are known to be present.

9.6.19 The LWSs are similarly designated for grassland and woodland habitats; with a diverse range of plants and invertebrates.

9.6.20 These sites are considered to be of National Importance (SSSIs) and County Importance (LWSs).

**Table 9.4: Designated Sites in Proximity to Green Hill A.2**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 0.31km east |
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 2.1km southeast |
| Pitsford Reservoir SSSI | 413.06 | Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded. | 2.54km southwest |
| Birch Spinney and Mawsley Marsh SSSI | 12.26 | A rare type of ash-maple woodland partly on peat, with flora including blunt-flowered rush, jointed rush and water horsetail. There is also a stretch of a dismantled railway line. | 3.52km northwest |
| Walgrave East Meadow LWS | 6.11 | A grassy meadow with a good selection of meadow plants and two streams fringed with rush pasture. The site qualifies as a LWS with ten neutral grassland indicator species recorded (one rare). | 0.14km southwest |
| Broughton Green Lane LWS | 2.85 | This site comprises a green lane, which forms a good wildlife corridor, with ancient woodland indicators and diverse range of invertebrates recorded. | 0.44km north |
| Highcroft Farm Meadow LWS | 1.44 | A neglected meadow which, although predominately species poor having declined due to lacking appropriate management, hosts an excellent invertebrate assemblage with supporting habitats considered likely to improve through restoration. | 0.48km north |
| Hardwick Wood LWS | 39.93 | An ancient woodland site that has been mainly replanted with a mixture of oak and spruce. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS as 20 ancient woodland indicators (alongside 21 neutral grassland indicators) were recorded. | 1.45km southeast |

*Green Hill B*

9.6.21 The Upper Nene Valley Gravel Pits SPA lies approximately 7.39km to the south of Green Hill B at its closest point.

9.6.22 Three SSSIs, three LNRs, two LWSs and one WTR were located within the search radii of Green Hill B and are listed in **Table 9.5** below.

9.6.23 The SSSIs were designated for their habitats, including open water, diverse pasture and woodland. Rare plants and invertebrates are known to be present.

9.6.24 The LNRs were designated for their grassland, hedgerow and woodland habitats. Lings Wood LNR supports breeding amphibians in the ponds.

9.6.25 The LWSs are designated for their woodland habitats.

9.6.26 The WTR encapsulates part of the Pitsford Water SSSI, with the chief interest being the wintering and passage waders it supports.

9.6.27 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LNRs/ LWSs/ WTRs).

**Table 9.5: Designated Sites in Proximity to Green Hill B**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Pitsford Reservoir SSSI | 413.06 | Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded. | 0.64km northwest |
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 3.375km north |
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 3.83km northeast |
| Crowfields Common LNR | 8.73 | Three fields, adjacent to the village of Moulton. The fields are currently rough grassland, with well-established hedgerows, a few mature trees and it contains a fine example of ridge and furrow farming and a wildflower meadow. | 1.86km south |
| Lings Wood LNR | 20.06 | This site features plantation and naturally regenerating woodland, along with scrub, ponds and acid grassland. Amphibians such as frogs and newts are also known to breed within the site. | 3.9km south |
| Scrub Field LNR | 5.05 | This site forms part of the Bradlaugh Fields Park complex, and contains fine examples of unimproved, semi-natural limestone grassland and fragments of ancient hedgerow. | 4.64km southwest |
| Hog Hole Spinney LWS | 4.8 | A largely broadleaved woodland on sandy soil. Trees include ash and oak, with a dense scrub layer below. This is a significant site, being the largest woodland for several kilometres around | 1.09km southwest |
| Cowpasture Spinney LWS | 9.09 | A long, narrow shelterbelt spinney with a stream running through the centre and associated emergent vegetation. The tree cover is very varied and the ground cover contains a number of ancient woodland indicator species. | 1.38km southeast |
| Pitsford Water Wildlife Trust Reserve (WTR) | 181.25 | Forms part of Pitsford Reservoir SSSI. Four main streams enter the reserve and form large bays of shallow water across connected valleys. During winter these provide excellent feeding and sheltering areas for wildfowl, whereas lowered water levels in summer expose stretches of mud and foraging areas for migrating waders. | 0.76km north |

*Green Hill C*

9.6.28 The Upper Nene Valley Gravel Pits SPA lies approximately 5.83km to the southeast of Green Hill C at its closest point.

9.6.29 Three SSSIs, three LNRs and five LWSs were located within the search radii of Green Hill C and are listed in **Table 9.6** below.

9.6.30 The SSSIs were designated for their habitats, including open water, diverse pasture and woodland. Rare plants and invertebrates are known to be present.

9.6.31 The LNRs were designated for their woodland and grassland habitats. Lings Wood LNR supports breeding amphibians in the ponds.

9.6.32 The LWSs were designated chiefly for their woodland habitats. Sywell Reservoir and Country Park LWS also contains diverse grassland and swamp, whereas Hardwick Road Verge LWS comprises diverse grassland.

9.6.33 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LNRs/ LWSs).

**Table 9.6: Designated Sites in Proximity to Green Hill C**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 1.33km north |
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 2.76km north |
| Pitsford Reservoir SSSI | 413.06 | Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded. | 3.69km northwest |
| Glamis Meadow and Wood LNR | 9.47 | A stream runs through this site, which also features woodland and grassland. | 4.06km east |
| Crowfields Common LNR | 8.73 | Three fields, adjacent to the village of Moulton. The fields are currently rough grassland, with well-established hedgerows, a few mature trees and it contains a fine example of ridge and furrow farming and a wildflower meadow. | 4.52km southwest |
| Lings Wood LNR | 20.06 | This site features plantation and naturally regenerating woodland, along with scrub, ponds and acid grassland. Amphibians such as frogs and newts are also known to breed within the site. | 4.67km southwest |
| Hardwick Wood LWS | 39.93 | An ancient woodland site that has been mainly replanted with a mixture of oak and spruce. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS as 20 ancient woodland indicators (alongside 21 neutral grassland indicators) were recorded. | 1.55km north |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Sywell Reservoir and Country Park LWS | 48 | A country park consisting of a reservoir and a good mosaic of other habitats including neutral grassland, scrub woodland and swamp edge. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with 12 fen/swamp/marsh indicators and 13 neutral grassland indicators recorded. | 1.84km south |
| Hardwick Road Verge LWS | 0.19 | Two sections of verge to the north and south of Hardwick Road. With nine neutral grassland indicators on the southern section (including three strong) and eight on the northern section (including three strong) these verges qualify as a Protected Wildflower Verge (PWV) and a LWS. | 1.87km northeast |
| Vivians Covert LWS | 4.64 | This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with seven ancient woodland indicators recorded and opportunity to improve. | 1.88km east |
| Cowpasture Spinney LWS | 9.09 | A long, narrow shelterbelt spinney with a stream running through the centre and associated emergent vegetation. The tree cover is very varied and the ground cover contains a number of ancient woodland indicator species. | 1.95km southwest |

*Green Hill D*

9.6.34 The Upper Nene Valley Gravel Pits SPA lies approximately 4.91km to the southeast of Green Hill D at its closest point. The Upper Nene Valley Gravel Pits SSSI is an overlapping designation with the SPA and lies the same distance away from Green Hill D at its closest point.

9.6.35 In total, four SSSIs, two LNRs and four LWSs were located within the search radii of Green Hill D and are listed in **Table 9.7** below.

9.6.36 The SSSIs were designated for their habitats, including open water, diverse pasture and woodland. Two SSSIs support large numbers of breeding/ wintering birds. Rare plants and invertebrates are also known to be present.

9.6.37 The LNRs were designated for their woodland and grassland habitats. Lings Wood LNR supports breeding amphibians in the ponds.

9.6.38 The LWSs were designated for a range of habitats.

9.6.39 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LNRs/ LWSs).

**Table 9.7: Designated Sites in Proximity to Green Hill D**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 1.72km northwest |
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 3.12km north |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Upper Nene Valley Gravel Pits SSSI | 1,832 | This SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, wintering waterbird species, an assemblage of over 20,000 waterbirds in the non-breeding season and a rare example of wet floodplain woodland. | 4.91km southeast |
| Pitsford Reservoir SSSI | 413.06 | Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded. | 5km west |
| Glamis Meadow and Wood LNR | 9.47 | A stream runs through this site, which also features woodland and grassland. | 3.52km east |
| Lings Wood LNR | 20.06 | This site features plantation and naturally regenerating woodland, along with scrub, ponds and acid grassland. Amphibians such as frogs and newts are also known to breed within the site. | 4.46km southwest |
| Sywell Reservoir and Country Park LWS | 48 | A country park consisting of a reservoir and a good mosaic of other habitats including neutral grassland, scrub woodland and swamp edge. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with 12 fen/swamp/marsh indicators and 13 neutral grassland indicators recorded. | 1.14km southwest |
| Vivians Covert LWS | 4.64 | This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with seven ancient woodland indicators recorded and opportunity to improve. | 1.41km east |
| Hardwick Road Verge LWS | 0.19 | Two sections of verge to the north and south of Hardwick Road. With nine neutral grassland indicators on the southern section (including three strong) and eight on the northern section (including three strong) these verges qualify as a Protected Wildflower Verge (PWV) and a LWS. | 1.69km northeast |
| Park Farm Industrial Estate LWS | 7.41 | Park Farm Industrial Estate contains a matrix of grassland, scrub and woodland. The site does not meet the neutral grassland criteria with only seven species recorded. However, with management it is possible it could recover hence it is retained as LWS. | 1.7km east |

*Green Hill E*

9.6.40 The Upper Nene Valley Gravel Pits SPA lies approximately 2.61km to the southeast of Green Hill E at its closest point. The Upper Nene Valley Gravel Pits SSSI is an overlapping designation with the SPA, but an additional area is designated as the SSSI and not the SPA, which lies slightly closer to Green Hill E: within 2.5km.

9.6.41 In total, four SSSIs, four LNRs and five LWSs were located within the search radii of Green Hill E and are listed in **Table 9.8** below.

9.6.42 The SSSIs were designated for their open water, woodland and diverse grassland habitats. The Upper Nene Valley Gravel Pits SSSI supports large numbers of breeding/ wintering birds and the other SSSIs support diverse flora, which in turn support uncommon invertebrates.

9.6.43 The LNRs were designated for their woodland, grassland and wetland habitats. Lings Wood LNR supports breeding amphibians in the ponds. Summer Leys LNR is an overlapping designation of the Upper Nene Valley Gravel Pits SSSI.

9.6.44 The LWSs were designated for a range of habitats. Wilby Meadows Stream LWS may support water voles.

9.6.45 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LNRs/ LWSs).

**Table 9.8: Designated Sites in Proximity to Green Hill E**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Upper Nene Valley Gravel Pits SSSI | 1,832 | This SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, wintering waterbird species, an assemblage of over 20,000 waterbirds in the non-breeding season and a rare example of wet floodplain woodland. | 2.5km southeast |
| Hardwick Lodge Meadow SSSI | 10 | This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates. | 2.58km northwest |
| Wollaston Meadows SSSI | 14.25 | This site on the banks of the River Nene is composed of two species-rich hay fields. Flora includes meadow foxtail, crested dog's-tail and red fescue. Overgrown hedges and ditches provide habitats for birds, small mammals, and invertebrates. | 3.89km southeast |
| Badsaddle, Withmale Park and Bush Walk Woods SSSI | 25.18 | This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid. | 4km north |
| Glamis Meadow and Wood LNR | 9.47 | A stream runs through this site, which also features woodland and grassland. | 2.88km northeast |
| Summer Leys LNR, LWS | 48 | A component of the Upper Nene Valley Gravel Pits SSSI with extensive wetland habitat, including fen, swamp, marshland and neutral grassland | 3.06km southeast |
| Lings Wood LNR | 20.06 | This site features plantation and naturally regenerating woodland, along with scrub, ponds and acid grassland. Amphibians such as frogs and newts are also known to breed within the site. | 3.63km southwest |
| Crowfields Common LNR | 8.73 | Three fields, adjacent to the village of Moulton. The fields are currently rough grassland, with well-established hedgerows, a few mature trees and it contains a fine example of ridge and furrow farming and a wildflower meadow. | 4.7km west |
| Sywell Reservoir and Country Park LWS | 48 | A country park consisting of a reservoir and a good mosaic of other habitats including neutral grassland, scrub woodland and swamp edge. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with 12 fen/swamp/marsh indicators and 13 neutral grassland indicators recorded. | 0.37km west |
| Wilby Meadows Stream LWS | 0.14 | A section of the Wilby Brook that flows through farmland on the edge of the village and designated for its water vole colony. The site has been retained as a Wildlife Site as the most recent survey suggests water vole are still present. | 0.68km east |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Park Farm Industrial Estate LWS | 7.41 | Park Farm Industrial Estate contains a matrix of grassland, scrub and woodland. The site does not meet the neutral grassland criteria with only seven species recorded. However with management it is possible it could recover hence it is retained as LWS. | 1.13km northeast |
| Vivians Covert LWS | 4.64 | This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with seven ancient woodland indicators recorded and opportunity to improve. | 1.3km northeast |
| Wilby Way Meadows LWS | 5.61 | A neutral grassland site that has suffered from poor management in recent years. Species-rich patches of MG5 grassland remain and the site qualifies as a LWS as it is a lowland meadow with areas of MG5 vegetation and 9 neutral indicator species recorded. | 1.81km east |

*Green Hill BESS*

9.6.46 The Upper Nene Valley Gravel Pits SPA and SSSI lie adjacent to the northeast of Green Hill BESS.

9.6.47 In total, three SSSIs, one LNR and sixteen LWSs were located within the search radii of Green Hill BESS and are listed in **Table 9.9** below.

9.6.48 The SSSIs were designated for their open water, diverse grassland, and woodland habitats. The Upper Nene Valley Gravel Pits SSSI supports large numbers of breeding/ wintering birds and the other SSSIs support diverse flora and invertebrates.

9.6.49 Summer Leys LNR (also designated as a LWS) is a component of the Upper Nene Valley Gravel Pits SSSI and contains a range of wetland and grassland habitats.

9.6.50 The LWSs were designated for a range of habitats, including a large number of waterbodies of importance to overwintering birds and amphibians; diverse grassland and woodland.

9.6.51 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LNRs/ LWSs).

**Table 9.9: Designated Sites in Proximity to Green Hill BESS**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Upper Nene Valley Gravel Pits SSSI | 1,832 | This SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, wintering waterbird species, an assemblage of over 20,000 waterbirds in the non-breeding season and a rare example of wet floodplain woodland. | Adjacent |
| Bozeat Meadow SSSI | 2.63 | This is unimproved grassland on well drained clay and loam soils. It has medieval ridge and furrow and diverse flora, including crested dog's-tail, downy oat-grass, quaking grass and dwarf thistle. There are also mature hedgerows and a spring. | 3.1km southeast |
| Wollaston Meadows SSSI | 14.25 | This site on the banks of the River Nene is composed of two species-rich hay fields. Flora includes meadow foxtail, crested dog's-tail and red fescue. Overgrown hedges and ditches provide habitats for birds, small mammals, and invertebrates. | 3.61km northeast |
| Summer Leys LNR, LWS | 48 | A component of the Upper Nene Valley Gravel Pits SSSI with extensive wetland habitat, including fen, swamp, marshland and neutral grassland | 1.96km northeast |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Grendon Lakes LWS | 126 | A mosaic of wetland habitats and of huge importance to over-wintering birds this site qualifies as a LWS because it contains a variety of species of stonewort amongst other wetland vegetation. | Within red line |
| Grendon Lakes North LWS | 33.97 | A mosaic of wetland habitats including a number of small gravel pits, fragments of wet grassland and mire and good aquatic vegetation. The site qualifies as an LWS due to the presence of ten fen, swamp and marsh indicators within these wetland habitats. | 0.13km north |
| Grendon Quarter Pond LWS | 4.39 | A large fishing lake that offers good cover, with a fringe of marginal vegetation and a surround of tall trees. | 0.41km south |
| Earls Barton Lock Lake LWS | 26 | A Nene Valley gravel pit with abundant marginal vegetation. The site qualifies as a LWS as this marginal vegetation holds 13 fen, swamp and marsh indicator species. | 0.44km north |
| Earls Barton Meadow LWS | 6.09 | A floodplain meadow site adjacent to the River Nene, near to gravel extraction. This site has been identified as a potential wildlife site and features six neutral grassland indicators, including one strong indicator and many of the elements of MG4 grassland. Therefore, the site is an out of condition Wildlife Site. | 0.46km northwest |
| Earl's Barton Carr LWS | 20 | A large area of wet woodland on former gravel workings adjacent to the Nene. Although declining in quality the site easily qualifies as a LWS due to the presence of a large area of wet woodland habitat and the presence of ten fen, swamp, marsh indicator species. | 0.47km northwest |
| Scotland Pond LWS | 3.41 | A large angling lake fringed with marginal and emergent vegetation. | 0.76km south |
| The Basin LWS | 2.53 | A narrow lake within the Castle Ashby Estate, with a good cover of emergent and marginal vegetation providing habitat for birds and amphibians. | 1.03km southwest |
| Castle Ashby Woodland LWS | 2.47 | A patch of old woodland that probably dates from the time of Castle Ashby parkland. There is a large amount of wych elm in the canopy, and a mixture of other broadleaved species, mainly ash and scrub such as elder, hawthorn, crab apple and sallow. An oddly structured woodland, but well-established and probably of interest for invertebrates as well as the unusual plants. | 1.33km southwest |
| Menagerie Pond LWS | 2.09 | A lake within the Castle Ashby parkland, with areas of thick fringing emergent vegetation and occasional aquatics. The invertebrate life is said to be of interest. | 1.35km south |
| Ecton Gravel Pits LWS | 50.25 | Three gravel pits alongside the River Nene, the pits vary in size and shape and provide a mixture of wildlife habitats. The site qualifies as a LWS as 12 wetland indicators were recorded across the site. | 1.5km northwest |
| Par Pond LWS | 3.21 | A long lake on the edge of Castle Ashby Park, well-vegetated with emergent and marginal vegetation and surrounded by parkland. | 1.53km south |
| Castle Ashby Parkland LWS | 4.47 | This woodland is near the centre of Castle Ashby parkland and leads from the church to the ponds and boathouse. It contains a large variety of parkland and semi-natural species, and a largely semi-natural ground flora with several ancient woodland species and one or two odd parkland additions. | 1.73km south |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Engine Pond LWS | 2.32 | A well-established pond, with emergent vegetation and abundant dragonflies and damselflies. | 1.89km southwest |
| Hardwater Meadows LWS | 27.69 | A series of fields adjacent to the Nene. The site retains its LWS status to the presence of species rich wetland vegetation around the pond and alongside the old course of the river. A total of 11 fen, swamp and marsh indicators were recorded. | 1.95km northeast |
| Warren Ponds LWS | 0.3 | These ponds extend the habitat of Par Pond and provide cover for birds and amphibians, they are of some significance as an extension to the habitat corridor. | 1.99km south |

*Green Hill F*

9.6.52 The Upper Nene Valley Gravel Pits SPA lies approximately 1.98km to the northwest of Green Hill F at its closest point. The upper Nene Valley Gravel Pits SSSI is an overlapping designation with the SPA, and lies the same distance away from Green Hill F at its closest point.

9.6.53 In total, six SSSIs, one LNR, seventeen LWSs and three CWSs were located within the search radii of Green Hill F and are listed in **Table 9.10** below.

9.6.54 The SSSIs were designated for their open water, grassland and woodland habitats, with value to wintering birds, plants and invertebrates.

9.6.55 The LWSs were designated for a range of habitats, including woodland, grassland, road verge, parkland and open water.

9.6.56 The CWSs are all designated for their broadleaved, semi-natural, ancient woodland.

9.6.57 These sites are considered to be of National Importance (SSSIs) and County Importance (LWSs/ CWSs).

**Table 9.10: Designated Sites in Proximity to Green Hill F**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Bozeat Meadow SSSI | 2.63 | This is unimproved grassland on well drained clay and loam soils. It has medieval ridge and furrow and diverse flora, including crested dog's-tail, downy oat-grass, quaking grass and dwarf thistle. There are also mature hedgerows and a spring. | 0.071km east |
| Upper Nene Valley Gravel Pits SSSI | 1,832 | This SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, wintering waterbird species, an assemblage of over 20,000 waterbirds in the non-breeding season and a rare example of wet floodplain woodland. | 1.98km northwest |
| Dungee Corner Meadow SSSI | 5.12 | This well drained hay meadow on boulder clay is traditionally managed, and no artificial fertilisers or herbicides have been used, so it has a diverse flora. More than twenty grass species have been recorded, including sweet vernal grass, Yorkshire fog, sheep's fescue, quaking grass, and crested dog's-tail. There is also a population of the locally rare green-winged orchid. | 2.1km east |
| Yardley Chase SSSI | 357.61 | This chase has diverse semi-natural habitats, and its value for invertebrates has been enhanced by military use of the site, which has resulted in a long absence of intensive agriculture. There is woodland and unimproved grassland, and 30 breeding butterfly species have been recorded. | 3.8km southwest |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Wollaston Meadows SSSI | 14.25 | This site on the banks of the River Nene is composed of two species-rich hay fields. Flora includes meadow foxtail, crested dog's-tail and red fescue. Overgrown hedges and ditches provide habitats for birds, small mammals, and invertebrates. | 3.86km north |
| Odell Great Wood SSSI | 85.7 | A large wet ash-maple woodland with exceptionally rich flora. The extensive and well-developed system of rides is another important feature, adding greatly to the value of the site for flowering plants, butterflies, and other invertebrates. | 4.81km east |
| Horn Wood LWS | 24.4 | This site qualifies as a LWS with 14 ancient woodland indicators recorded. | Adjacent to southern site boundary |
| Summer Leys LNR, LWS | 48 | A component of the Upper Nene Valley Gravel Pits SSSI with extensive wetland habitat, including fen, swamp, marshland and neutral grassland | 2.76km north |
| The Slipe CWS | 5.4 | Broadleaved, semi-natural, ancient woodland. | 1.17km east |
| Nun Wood CWS | 17.9 | Broadleaved ancient woodland, neutral grassland and a pond. Directly connected to Threeshire's Wood. | 1.2km northwest |
| Templegrove Spinney CWS | 1.7 | Broadleaved, semi-natural, ancient woodland. | 1.76km west |
| Horn Wood LWS | 24.4 | Ancient semi-natural woodland with 14 ancient woodland indicators and 13 neutral grassland indicators recorded. | Adjacent east |
| Bozeat Verge LWS | 0.63 | A species rich wildflower verge formed on the road cutting of the A509 to the west of Bozeat. The verge also had abundant insects with numerous butterflies and bees. | 0.015km south |
| Bozeat Cemetery LWS | 0.79 | This cemetery contains areas of species rich meadow. | 0.28km east |
| Cold Oak Copse LWS | 43.4 | This LWS is listed on the Northants Ancient Wood inventory, with six ancient woodland indicators recorded. | 0.31km west |
| Long Furlong and Old Pastures LWS | 69.9 | A large area of replanted ancient woodland, with 16 ancient woodland indicators recorded. | 0.49km southwest |
| Bozeat Glebe Meadow LWS | 1.01 | A former hay meadow that has still retained a decent meadow flora, in particular on the slopes. | 0.51km east |
| Yardley Brook Field LWS | 2.52 | This field has areas of species rich calcareous grassland associated with the old earthworks, which qualify the site as a LWS with 12 calcareous indicators recorded. | 0.59km west |
| Bozeat Wood LWS | 3.7 | A small oak-ash woodland, possibly ancient in origin, with an interesting ground flora. | 0.62km southeast |
| Par Pond LWS | 3.21 | A long lake on the edge of Castle Ashby Park, well-vegetated with emergent and marginal vegetation and surrounded by parkland. | 1.12km west |

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Menagerie Pond LWS | 2.09 | A lake within the Castle Ashby parkland, with areas of thick fringing emergent vegetation and occasional aquatics. The invertebrate life is said to be of interest. | 1.23km west |
| Warren Ponds LWS | 0.3 | These ponds extend the habitat of Par Pond and provide cover for birds and amphibians, they are of some significance as an extension to the habitat corridor. | 1.3km west |
| Castle Ashby Parkland LWS | 4.47 | This woodland is near the centre of Castle Ashby parkland and leads from the church to the ponds and boathouse. It contains a large variety of parkland and semi-natural species, and a largely semi-natural ground flora with several ancient woodland species and one or two odd parkland additions. | 1.32km west |
| Grendon Quarter Pond LWS | 4.39 | A large fishing lake that offers good cover, with a fringe of marginal vegetation and a surround of tall trees. | 1.48km northwest |
| Threeshire's Wood LWS | 14.8 | Ancient semi-natural woodland with a good range of ground flora species, as well as birds (notably tree sparrow) and other species. | 1.59km southeast |
| Scotland Pond LWS | 3.41 | A large angling lake fringed with marginal and emergent vegetation. | 1.71km west |
| The Basin LWS | 2.53 | A narrow lake within the Castle Ashby Estate, with a good cover of emergent and marginal vegetation providing habitat for birds and amphibians. | 1.88km northwest |
| Castle Ashby Woodland LWS | 2.47 | A patch of old woodland that probably dates from the time of Castle Ashby parkland. There is a large amount of wych elm in the canopy, and a mixture of other broadleaved species, mainly ash and scrub such as elder, hawthorn, crab apple and sallow. An oddly structured woodland, but well-established and probably of interest for invertebrates as well as the unusual plants. | 1.97km northwest |

*Green Hill G*

9.6.58 The Upper Nene Valley Gravel Pits SPA lies approximately 6.18km to the southeast of Green Hill G at its closest point.

9.6.59 In total, three SSSIs, one LNR, five LWSs and three CWSs were located within the search radii of Green Hill G and are listed in **Table 9.11** below.

9.6.60 The SSSIs were designated for their grassland and woodland habitats, with value to plants and invertebrates.

9.6.61 Harrold Odell Country Park LNR contains lakes, seasonally flooded woodland and meadows, supporting a diverse range of species.

9.6.62 The LWSs and CWSs are all designated for their broadleaved, semi-natural, ancient woodland. Tree sparrow are known to be present at two sites.

9.6.63 These sites are considered to be of **National Importance** (SSSIs) and **County Importance** (LWSs/ CWSs).

**Table 9.11: Designated Sites in Proximity to Green Hill G**

| Site Name | Area (ha) | Description | Proximity |
|---|---|---|---|
| Bozeat Meadow SSSI | 2.63 | This is unimproved grassland on well drained clay and loam soils. It has medieval ridge and furrow and diverse flora, including crested dog's-tail, downy oat-grass, quaking grass and dwarf thistle. There are also mature hedgerows and a spring. | 2.85km north |
| Yardley Chase SSSI | 357.61 | This chase has diverse semi-natural habitats, and its value for invertebrates has been enhanced by military use of the site, which has resulted in a long absence of intensive agriculture. There is woodland and unimproved grassland, and 30 breeding butterfly species have been recorded. | 3.75km west |
| Dungee Corner Meadow SSSI | 5.12 | This well drained hay meadow on boulder clay is traditionally managed, and no artificial fertilisers or herbicides have been used, so it has a diverse flora. More than twenty grass species have been recorded, including sweet vernal grass, Yorkshire fog, sheep's fescue, quaking grass, and crested dog's-tail. There is also a population of the locally rare green-winged orchid. | 4.18km northeast |
| Harrold Odell Country Park LNR | 59.31 | The site is on the edge of the River Ouse. There are two lakes, seasonally flooded woodland, osier beds and water meadows. The site supports a range of birds, including several priority species. Otters, bats, amphibians, reptiles and a range of orchid species are also known to be present. | 4.51km northeast |
| Threeshire's Wood LWS | 14.8 | Ancient semi-natural woodland with a good range of ground flora species, as well as birds (notably tree sparrow) and other species. | Adjacent |
| Nun Wood CWS | 17.9 | Broadleaved ancient woodland, neutral grassland and a pond. Directly connected to Threeshire's Wood. | Adjacent |
| Bozeat Wood LWS | 3.7 | A small oak-ash woodland, possibly ancient in origin, with an interesting ground flora. | 0.32km north |
| The Slipe CWS | 5.4 | Broadleaved, semi-natural, ancient woodland. | 0.5km northeast |
| Lavendon Wood LWS | 20.7 | Ancient semi-natural woodland with a good range of ground flora species, as well as fungi, birds (notably tree sparrow) and other species. | 0.74km east |
| Long Furlong and Old Pastures LWS | 69.9 | A large area of replanted ancient woodland, with 16 ancient woodland indicators recorded. | 0.85km west |
| Horn Wood LWS | 24.4 | This site qualifies as a LWS with 14 ancient woodland indicators recorded. | 1.39km northwest |
| Templegrove Spinney CWS | 1.7 | Broadleaved, semi-natural, ancient woodland. | 1.56km northeast |

**Cable Route Search Area**

9.6.64 As detailed within **Volume 3**, **Appendix 9.3**, six non-statutory designated sites (all LWSs) were located within the Cable Route Search Area. These are summarised in **Table 9.12** below. All LWSs are considered to be of **County Importance**.

9.6.65 No statutory designated sites were located within the Cable Route Search Area.

**Table 9.12: Designated Sites within Cable Route Search Area**

| Site Name | Area (ha) | Description |
|---|---|---|
| Earls Barton Meadow LWS | 6.09 | A floodplain meadow site adjacent to the River Nene, near to gravel extraction. This site has been identified as a potential wildlife site and features six neutral grassland indicators, including one strong indicator and many of the elements of MG4 grassland. Therefore, the site is an out of condition Wildlife Site. |
| Ecton Gravel Pits LWS | 50.25 | Three gravel pits alongside the River Nene, the pits vary in size and shape and provide a mixture of wildlife habitats. The site qualifies as a LWS as 12 wetland indicators were recorded across the site. |
| Grendon Lakes LWS | 126 | A mosaic of wetland habitats and of huge importance to over-wintering birds this site qualifies as a LWS because it contains a variety of species of stonewort amongst other wetland vegetation. |
| Grendon Lakes North LWS | 33.97 | A mosaic of wetland habitats including a number of small gravel pits, fragments of wet grassland and mire and good aquatic vegetation. The site qualifies as an LWS due to the presence of ten fen, swamp and marsh indicators within these wetland habitats. |
| Grendon Quarter Pond LWS | 4.39 | A large fishing lake that offers good cover, with a fringe of marginal vegetation and a surround of tall trees. |
| Wilby Meadows Stream LWS | 0.14 | A section of the Wilby Brook that flows through farmland on the edge of the village and designated for its water vole colony. The site has been retained as a Wildlife Site as the most recent survey suggests water vole are still present. |

**Habitats**

9.6.66 The habitats recorded within the Sites are detailed in **Table 9.13** below. This table details the extent of each habitat and its proportion of the total area of the Sites, as well as the BNG condition score. Furthermore, it provides a justification of each habitat's importance, based on its rarity, extent and legislative/policy status.

9.6.67 The following Habitats of Principal Importance all occur off-site within 2km of the Sites, and will therefore be considered during the assessment in terms of opportunities for enhancement and restoration of habitat networks:

- Coastal and Floodplain Grazing Marsh;
- Deciduous Woodland;
- Good Quality Semi-Improved Grassland;
- Lowland Calcareous Grassland;
- Lowland Fens;
- Lowland Meadows;
- Priority Ponds;
- Reedbeds;
- Traditional Orchards; and
- Wood-pasture and Parkland.

9.6.68 At the time of writing, no fieldwork in relation to the Cable Route Search Area has been undertaken, although an examination of publicly-available mapping, and a desk study to search for the location of nearby Priority Habitats has been completed (see **Volume 3**, **Appendix 9.3**) and informs this section.

9.6.69 This information should be read in conjunction with the UKHab habitat survey maps provided in **Volume 3**, **Appendix 9.2.**

**Table 9.13: Habitat Types within the Scheme and their Extent and Importance**

| Habitat | Area (ha) / length (km) | % of Site area | Sites Where Recorded | Condition Assessment Score | Notable Habitat? | Biodiversity Importance | Rationale |
|---|---|---|---|---|---|---|---|
| **Cropland** | | | | | | | |
| Cereal crops | 699.7 | 57.1 | A, A.2, B, D, E, F, G, BESS | N/A | No | Site | As they are of negligible botanical interest, the arable fields are considered to be of Site Importance. |
| Non-cereal crops | 115.5 | 9.4 | A, C, D, E | N/A | No | Site | |
| Temporary grass and clover leys | 114.6 | 9.4 | A, E, G | N/A | No | Site | |
| Winter stubble | 73.3 | 6.0 | C, E | N/A | No | Site | |
| Arable field margins game bird mix | 8.3 | 0.7 | A, C, E, F | N/A | Arable field margins are a Habitat of Principal Importance and listed on the Northamptonshire BAP. | Local | Given their status as Habitats of Principal Importances and Local BAP habitats, arable margins are considered to be of Local Importance. |
| Arable field margins pollen and nectar | 14.5 | 1.2 | A, B, C, E, F | N/A | | Local | |
| Arable field margins tussocky | 14.9 | 1.2 | A, B, C, D, E, F, BESS | N/A | | Local | |
| **Grassland** | | | | | | | |
| Modified grassland | 94.3 | 7.7 | A, B, C, D, E, F, G | Good – 23.1%<br>Moderate – 19.1%<br>Poor – 57.8% | No | Site | Not a Habitat of Principal Importance, and of limited ecological value. |
| Other neutral grassland | 36.1 | 2.9 | A, C, E, F, G | Good – 28.5%<br>Moderate – 58.9%<br>Poor – 12.6% | No | Local | Not a Habitat of Principal Importance, but of elevated ecological value. |
| **Heathland and shrub** | | | | | | | |
| Blackthorn scrub | 1.2 | 0.1 | E | Poor | No | Site | |

| Habitat | Area (ha) / length (km) | % of Site area | Sites Where Recorded | Condition Assessment Score | Notable Habitat? | Biodiversity Importance | Rationale |
|---|---|---|---|---|---|---|---|
| Bramble scrub | 3.4 | 0.3 | D, E, F | N/A | No | Site | Not a Habitat of Principal Importance, and of limited ecological value given small extent. |
| Mixed scrub | 1.9 | 0.2 | A, B, C, E | Good – 8.7%<br>Poor – 91.3% | No | Site | |
| **Woodland and forest** | | | | | | | |
| Other woodland; broadleaved | 3.3 | 0.3 | A, C, E, F, G, BESS | Good – 7.3%<br>Moderate – 72.4%<br>Poor – 20.3% | Lowland mixed deciduous woodland is a Habitat of Principal Importance and listed on the Northamptonshire BAP, however none of the woodland on site qualified as this habitat type. | Local | Not a Habitat of Principal Importance, but of significant ecological value. |
| Other woodland; mixed | 2.5 | 0.2 | A, C, E | Moderate – 24.0%<br>Poor – 76.0% | | Local | |
| **Lakes** | | | | | | | |
| Ponds (priority habitat) | 0.3 | 0.02 | A, A.2, B, E, F | Moderate – 58.7%<br>Poor – 41.3% | Ponds are a Habitat of Principal Importance and listed on the Northamptonshire BAP. | District | Ponds qualify as being a priority habitat if they support species of high conservation importance, including UKBAP species. All on-site ponds have therefore been assumed to constitute priority habitat given the likelihood that toads and other amphibians (including great crested newts) may be present. Ponds are therefore considered to be of District Importance. |
| **Sparsely vegetated land** | | | | | | | |

| Habitat | Area (ha) / length (km) | % of Site area | Sites Where Recorded | Condition Assessment Score | Notable Habitat? | Biodiversity Importance | Rationale |
|---|---|---|---|---|---|---|---|
| Ruderal/ephemeral | 6.1 | 0.5 | A, C, D, E, F | Good – 40.5%<br>Moderate – 27.8%<br>Poor – 31.7% | No | Site | Not a Habitat of Principal Importance, and of limited ecological value. |
| Tall forbs | 0.2 | 0.02 | C, E, F | Good – 78.5%<br>Moderate – 21.5% | No | Site | |
| **Urban** | | | | | | | |
| Artificial unvegetated, unsealed surface | 0.9 | 0.07 | A, E, F | N/A | No | Negligible | Of negligible ecological value |
| Bare ground | 0.4 | 0.03 | A.2, E | Good – 27.6%<br>Poor – 72.4% | No | Negligible | |
| Developed land; sealed surface | 7.9 | 0.7 | A, B, C, E, F, G, BESS | N/A | No | Negligible | |
| **Hedgerows** | | | | | | | |
| Native hedgerow | 27.30 | N/A | A, B, C, D, E, F, G, BESS | Good – 57.3%<br>Moderate – 35.7%<br>Poor – 6.9% | Hedgerows are a Habitat of Principal Importance and listed on the Northamptonshire BAP. | Local | Given their status as Habitats of Principal Importances and BAP habitats, all hedgerow types are considered to be of Local Importance. |
| Native hedgerow – associated with bank or ditch | 11.16 | N/A | A, B, C, D, E, F, G | Good – 78.2%<br>Moderate – 21.1%<br>Poor – 0.7% | | Local | |
| Native hedgerow with trees | 11.65 | N/A | A, B, C, D, E, F, G, BESS | Good – 70.3%<br>Moderate – 22.7%<br>Poor – 7.1% | | Local | |

| Habitat | Area (ha) / length (km) | % of Site area | Sites Where Recorded | Condition Assessment Score | Notable Habitat? | Biodiversity Importance | Rationale |
|---|---|---|---|---|---|---|---|
| Native hedgerow with trees – associated with bank or ditch | 8.32 | N/A | All Sites | Good – 72.8%<br>Moderate – 24.0%<br>Poor – 3.2% | | Local | |
| Species-rich native hedgerow | 4.31 | N/A | A, A.2, C, D, E, F, G | Good – 87.3%<br>Moderate – 12.7% | | Local | |
| Species-rich native hedgerow – associated with bank or ditch | 5.36 | N/A | A, A.2, B, F, G | Good – 78.0%<br>Moderate – 12.5%<br>Poor – 9.4% | | Local | |
| Species-rich native hedgerow with trees | 6.76 | N/A | All Sites | Good – 52.7%<br>Moderate – 39.2%<br>Poor – 8.1% | | Local | |
| Species-rich native hedgerow with trees – associated with bank or ditch | 8.00 | N/A | A, A.2, B, C, D, G | Good – 88.6%<br>Moderate – 11.4% | | Local | |
| **Line of trees** | | | | | | | |
| Line of trees | 8.02 | N/A | A, C, E, F, BESS | Good – 12.3%<br>Moderate – 64.9%<br>Poor – 22.8% | Hedgerows are a Habitat of Principal Importance and listed on the Northamptonshire BAP. | Local | Given their status as Habitats of Principal Importances and BAP habitats, all line of tree types are considered to be of Local Importance. |
| Line of trees – associated with bank or ditch | 1.70 | N/A | A, E, G | Moderate – 57.0%<br>Poor – 43.0% | | Local | |
| **Watercourses** | | | | | | | |

| Habitat | Area (ha) / length (km) | % of Site area | Sites Where Recorded | Condition Assessment Score | Notable Habitat? | Biodiversity Importance | Rationale |
|---|---|---|---|---|---|---|---|
| Ditches | 7.95 | N/A | A, B, C, D, E, F, G, BESS | TBC (watercourse condition assessments to be completed) | No | Local | Although the ditch network is relatively extensive, most ditches supported low botanical diversity. The ditches on Site can be attributed a Local Importance. |
| Other rivers and streams | 11.89 | N/A | A, E, F, BESS | TBC (watercourse condition assessments to be completed) | Rivers are a Habitat of Principal Importance and listed on the Northamptonshire BAP. | District | These habitats are rarer in the local landscape and have elevated ecological value. This, combined with their Habitats of Principal Importance and BAP status, leads to an ascription of District importance. |

**Species**

9.6.70 This section summarises the findings to date of the species-specific surveys relating to the Sites, as well as the desk study, for which species records within 2km were obtained from the relevant records centres. As surveys are either ongoing or very recently completed, no technical reports have been produced at the time of writing. Therefore, this represents only a limited and preliminary summary of the baseline conditions at the Sites. Technical reports will be prepared in due course and will accompany the Environmental Statement as appendices.

9.6.71 The detailed results of the desk study, detailed survey methodologies and initial findings of the species-specific surveys, are contained within the appendices to this chapter.

*Badger*

9.6.72 Badgers, including their setts, are protected under The Protection of Badgers Act 1992.

9.6.73 A total of 154 records of badgers were returned by the desk study within 2km of the Sites, since 2000. The most recent record dates from 2022. Records of badgers exist within 2km of each of the Sites and badgers are widespread in the local landscape.

9.6.74 Evidence of badgers has also been gathered through an initial walkover survey of the Sites, and ad-hoc during targeted surveys for other species. Evidence has been recorded at all of the Sites excluding Green Hill A.2 and BESS. Green Hill E supported the highest frequency of badger setts, particularly in the southern portion of this Site. Badger setts and other evidence of badgers at the other sites was less frequent and more patchily distributed.

9.6.75 A total of 80 badger setts have been recorded to date, spread across all of the Sites (excluding Green Hill A.2 and BESS). Setts were recorded predominantly within hedgerows, woodland and pockets of scrub at field margins, but also on occasion within arable fields and arable field margins. Sett types recorded within the Sites ranged from single-entrance Outlying setts to Main setts with at least 40 entrances. Main setts were found at Green Hill A, C, E and F. At Green Hill B, D and G, setts were limited to outlying or subsidiary setts.

9.6.76 In addition to setts, evidence of badger presence has been recorded across the local landscape in the form of paths, latrines, hairs and live individuals. Live individuals were incidentally observed at Green Hill B, C, E, and F during nocturnal survey visits.

9.6.77 Given the geographical distribution and extent of the Sites, and the presence of badger setts across several of the sites, the Scheme as a whole is certainly used by multiple badger social groups.

9.6.78 The Sites contain significant extents of habitat suitable for foraging by badgers, including the arable and pasture fields, field margins, patches of woodland and scrub, and hedgerows. Badgers predominantly feed on soil invertebrates, particularly earthworms, but will take a wide variety of plant and animal prey items depending on availability. Arable fields have a lower earthworm abundance than grassland fields but may provide seasonal forage in the form of unharvested cereals. The grazed pasture fields, uncultivated margins, woodlands and hedgerows are likely to be more productive for badgers.

9.6.79 Badgers are not a species of conservation concern but receive legal protection on account of historic and ongoing persecution. Given their abundance within the Sites, especially Green Hill E, which is likely to be markedly higher than the surrounding land, they are considered to be of **Local Importance**.

*Bats*

9.6.80 All bat species and their roosts are fully protected under the Habitats Regulations, and all bats are Species of Principal Importance. A summary of the static bat detector deployment locations and the data gathered to date (up to and including July 2024) are provided in **Volume 3**, **Appendix 9.6**.

9.6.81 Data search records for bats obtained from Northamptonshire Bat Group were only provided with four-figure OS grid references, and therefore only identified a 1km square within which the record

was obtained. As a result, an accurate location that these records pertained to could not be identified.

9.6.82 Records of the following species were returned within 2km of at least one of the Sites since 2000: barbastelle *Barbastella barbastellus*, brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, whiskered bat *Myotis mystacinus*, unidentified *Pipistrellus* sp. and whiskered/Brandt's *Myotis brandtii* bats. Records of Daubenton's *Myotis daubentonii*, Leisler's *Nyctalus leisleri*, Nathusius's pipistrelle *Pipistrellus nathusii*, Natterer's *Myotis nattereri* and unidentified *Myotis* sp. were gathered from the surrounding area beyond 2km.

9.6.83 Within 2km, three barbastelle records were returned, including one roost record, which related to OS Grid Reference SP8370, closest to Green Hill C. Seventeen brown long-eared records were returned, including 15 roost records. Fourteen common pipistrelle records were returned, including six roost records. Six soprano pipistrelle records were returned, including two roost records. A further 23 unidentified *Pipistrellus* sp. records were returned, including 21 roost records. One noctule and one whiskered bat record were returned, as well as a roost record of a whiskered/ Brandt's bat.

9.6.84 Two European Protected Species (EPS) licences relating to bats were identified during the desk study. Firstly, EPSM2013-5557, which relates to the destruction of a breeding site and resting place of common pipistrelle, soprano pipistrelle and brown long-eared bat, approx. 1.8km west of Green Hill B. Secondly, 2016-21753-EPS-MIT, relating to damage and destruction of resting place of common pipistrelle, within 2km of Green Hill C to E.

*Foraging/Commuting Bats*

9.6.85 The Scheme supports habitats typical of arable farmland landscapes, including arable fields with and without field margins and conservation measures (such as overwintering stubble or species-rich grassland margins); grazed pasture; ponds, ditches and rivers; small pockets of woodland connected to more substantial parcels off-site; and a network of hedgerows of varying quality. Overall, this mosaic of habitats was classified to be of 'Moderate' habitat suitability, in accordance with the Bat Conservation Trust Survey Guidelines (Ref.41).

9.6.86 Bat activity surveys utilising a total of 43 static detectors deployed across all of the Sites are currently ongoing, having commenced in August 2023. Static detectors will be deployed at each of the Sites in each month between April and October, inclusive, for a minimum of five consecutive nights per deployment. These surveys are due to be completed across the Scheme in May 2025.

9.6.87 Full analysis of the collated data has not yet been undertaken, however a preliminary analysis has been undertaken of the data gathered between August 2023 and July 2024, inclusive.

9.6.88 To date, at least eight species have been recorded, including barbastelle, serotine, *Myotis* sp., *Nyctalus* sp., Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle and brown long-eared. It should be noted that due to the difficulty of identifying individual species within the *Myotis* genus from ultrasonic recordings alone, species have been amalgamated. Up to five *Myotis* species may be present, based on their national distribution and habitat preferences, comprising whiskered, Brandt's, Natterer's, Daubenton's and Bechstein's. Similarly, noctule and Leisler's bats within the *Nyctalus* genus have been amalgamated.

9.6.89 Approximately 82.3% of all activity recorded to date was attributed to common and soprano pipistrelle, with *Myotis* sp. and *Nyctalus* sp. accounting for 8.4% and 5.2% respectively. Barbastelle, a rarer species, accounted for 1.2% of activity. Brown long-eared bats was responsible for 2.2% of total activity, although this species is often more cryptic and harder to detect due to its quieter calls. Both serotine and Nathusius' pipistrelle constituted less than 0.5% of total activity; 0.42% and 0.16% respectively.

9.6.90 There were also differences between activity levels at the Sites. Given the differing numbers of static detectors deployed at each of the Sites, and the differing levels of survey effort at the Sites to date (number of months of completed surveys), bat activity was calculated as the average number of bat passes recorded per hour of night (across all detectors), to allow fairer comparison of the data. However, even with this methodology, comparison between Green Hill A.2, F and G,

relative to the Sites, should be treated with caution at this stage, due to the different survey timings and corresponding changes in bat activity across the season. Survey effort will be equalised at the point of submission and additional analyses undertaken.

9.6.91 The data indicates that the highest relative levels of activity were recorded at Green Hill BESS (29.9 passes/hour), followed by Green Hill F (24.5 passes/hour). Green Hill A.2 and B had similar levels of activity at 18.3 and 19.1 passes/hour, although significantly less survey data is currently held for Green Hill A.2, given its later addition to the Scheme. Green Hill G featured an average of 14.5 passes/hour; Green Hill A 10.9 passes/hour; Green Hill E 8.6 passes/hour and Green Hill C 7.1 passes/hour. The lowest activity levels were recorded at Green Hill D, with just 6.5 passes/hour, which is almost five times lower than the activity levels recorded at Green Hill BESS. Green Hill D constitutes the smallest and least heterogenous site, which may account for its reduced activity levels. By contrast, Green Hill BESS lies in close proximity to a significant watercourse and several lakes, which may offer preferential foraging habitats over arable land for many species.

9.6.92 Individual static detector locations which recorded substantially higher levels of activity included the following:

- The north of Green Hill BESS (SD23), close to Grendon Lakes; this is likely due to the proximity of the off-site lake, which serves as a good-quality foraging area and water resource. The level of activity recorded for both soprano pipistrelle and *Myotis* sp. (assumed in this case to predominately comprise Daubenton's bats, as this species preferentially forages over water) was substantially higher at Green Hill BESS than at any other site.
- The northeast of Green Hill F (SD27), close to woodland; the proximity of the woodland, which offers elevated foraging potential to the surrounding landscape, is likely to account for the greater activity levels recorded at this location. The woodland may also support roosting bats, which would also account for higher levels of bat activity in this area of the landscape.
- The south of Green Hill F (SD34), adjacent to a large block of woodland; as above, the woodland likely offers enhanced foraging and roosting habitat relative to arable habitats.
- The south of Green Hill F (SD35), along a hedgerow between two blocks of woodland; this hedgerow is likely to be of significant importance for bats commuting between the two woodland areas.
- The east of Green Hill G (SD40), just south of a large block of woodland; as above, the woodland offers enhanced foraging and roosting habitat.

9.6.93 In terms of individual species, the following broad trends were observed:

- Barbastelle activity was highest at Green Hill F, although levels at Green Hill C, G, E and BESS were also notably higher than the other sites.
- Serotine activity was very low, which was not unexpected given that this species has a patchy distribution in Northamptonshire.
- Activity of Myotis sp. at Green Hill BESS was more than double the levels at Green Hill B, where the next highest activity levels were recorded. This trend may be due to the presence of several rivers, woodland belts and the high ecological value of offsite habitats adjacent to Green Hill BESS. The lowest activity levels for Myotis were recorded at Green Hill A.2, D and E.
- Recorded activity of Nyctalus sp. was greatest at Green Hill BESS and F, but broadly comparable with other Green Hill sites.
- Nathusius' pipistrelle was recorded in low numbers across the Sites, with the greatest activity levels at Green Hill BESS.

- Common pipistrelle activity was highest at Green Hill F and lowest at Green Hill D. Soprano pipistrelle activity was highest at Green Hill BESS and B, and lowest at Green Hill F.
- Brown long-eared activity was highest at Green Hill C and BESS, and substantially lower at other Green Hill sites.

*Roosting Bats*

9.6.94 Ground level tree assessments (standard trees within fields, as well as field boundaries) have been completed across the Sites, to assess trees for their suitability to support roosting bats. Each linear feature that contains several trees will be buffered from the development area according to the highest level of suitability for roosting bats afforded to a tree along that particular linear feature, and therefore survey effort focused on trees with the highest suitability for roosting bats across any particular hedgerow/other linear feature.

9.6.95 A total of 372 trees with potential roost features have been identified, comprising 156 Low, 141 Moderate, and 75 High suitability. It is likely that a substantial number of bat roosts are present within trees that are located within the Sites from a range of different species. Potential roost features were found principally in mature ash and oak trees, but also willow, aspen, field maple, sycamore, horse chestnut, and dead standing trees.

9.6.96 Inspections of buildings present within the Scheme's boundary will also be completed to assess their suitability for roosting bats, where buildings suitable for roosting bats are at risk of habitat fragmentation or a loss of habitat connectivity resulting from the Scheme.

9.6.97 Considering the nature of the proposals within the Cable Route Seach Area being confined to temporary and reversible works (i.e. the impacted habitats will be reinstated once installation works have concluded) within a narrow working strip, it was not considered proportionate to carry out sampling surveys for bat activity within the Cable Route Search Area. The narrow, linear layout of the final Cable Corridor means that it would be impractical to collect meaningful data which would have a bearing on the siting of the cable. Furthermore, given the similarity of habitats and topography within the Cable Route Seach Area relative to that found within the Sites, it is anticipated that bat activity within the Cable Route Seach Area will be relatively comparable to that recorded within the Sites.

9.6.98 It is therefore proposed that an appraisal of the habitats, particularly hedgerows and field margins for foraging and dispersal and trees/buildings for roosting, will be undertaken. Any such valued features which may be directly or indirectly affected by the proposals would be investigated further and the findings used in the final design of the route. At this stage, it is considered that the proposed evaluation above will ensure that cable route design and impact assessment is based on robust evidence, although this approach will be re-evaluated following a habitats walkover assessment as planned.

9.6.99 Based on the data gathered to date, the bat assemblage at the Sites is considered to be of **District importance**. This evaluation is considered likely to be appropriate also for the Cable Route Search Area on account of the similarity of habitats, pending a walkover assessment of the habitats within the Cable Corridor as planned.

*Otter*

9.6.100 Otter is a Species of Principal Importance and protected under the Habitats Regulations.

9.6.101 Otter is a widespread species and is expected to be present within all principal river catchments in Northamptonshire.

9.6.102 A total of nine records of otter were returned by the data searches within 2km of the Sites, since 2000. The most recent record dates from 2020. Records of otters were centred around local reservoirs and ponds, including Pitsford and Sywell Reservoirs, as well as Wilby Way Meadows and the River Nene.

9.6.103 Surveys were conducted in spring and autumn (refer to **Table 9.2**) to assess the suitability of watercourses and well-connected ponds for otter, and to search for evidence of their presence.

**Volume 3**, **Appendix 9.7** provides survey results of all Autumn 2023 and Spring 2024 surveys in the context of each Site. A brief summary of survey results has been provided below.

9.6.104 All watercourses and ponds surveyed were deemed to be suitable for otters, in terms of being potentially usable for moving through the landscape and occasional foraging. However, the vast majority of features were assigned a 'suitable but poor' category, being mostly narrow and dry or with limited water.

9.6.105 Only fifteen watercourses/waterbodies were characterised as being of 'good' suitability, with another four considered to be 'optimal' suitability, being of a sufficient size and with sufficient water levels to support otter throughout the year. Features of good and optimal suitability comprised: one stream at Green Hill A, one stream at Green Hill E, one pond adjacent to Green Hill E, two ditches at Green Hill BESS (one of these being optimal); and twelve streams (three optimal) and two ditches at Green Hill F.

9.6.106 A limited number of ditches and streams contained bankside features conducive to holt creation, with suitably large mature trees being present adjacent to suitable watercourses only occasionally. These were most prevalent at Green Hill F.

9.6.107 The best otter habitat, in terms of connectivity to other watercourses, was along the western boundary of Green Hill E, the northern boundaries of Green Hill BESS, and the northwestern boundary of Green Hill F.

9.6.108 During the surveys completed to date, several signs of otters have been recorded, as can be seen in **Volume 3**, **Appendix 9.7.** Otter prints and/or spraint were found along the central ditch at Green Hill C, western boundary of Green Hill D, eastern and western boundaries of Green Hill E, northwestern boundary of Green Hill BESS, and northern section of Green Hill F. It is worth noting that otter surveys are ongoing at Green Hill F, G and A.2, given their later additions to the Scheme.

9.6.109 A holt was found along the western boundary of Green Hill E. Potential, but unconfirmed, otter resting sites were also found along the northwestern boundary of Green Hill F.

9.6.110 Due to the confirmed presence of otter across Green Hill C, D E and F, but bearing in mind the suboptimal nature of most of the watercourses within the Sites and otter's likely presence in all river catchments in the county, otter is considered to be of **Local Importance** in the context of the Site. This evaluation is considered likely to be appropriate also for the Cable Route Search Area on account of the similarity of ditch and watercourse networks across the local landscape, however this assessment will be confirmed following an assessment of the habitats within the Cable Corridor as planned.

*Water Vole*

9.6.111 Water voles are protected under the Wildlife and Countryside Act and are a Species of Principal Importance.

9.6.112 A total of 11 records of water voles were returned by the data searches since 2000. All records pertained to locations within 2km of either Green Hill C, D, or E, with the majority within 1km of Green Hill E. No records were returned within 2km of the other Sites. Records of water voles were centred around Wilby and Mears Ashby, including Swanspool Brook and Wilby Way Meadows. The most recent record dates from 2019.

9.6.113 Surveys were conducted in spring and autumn (refer to **Table 9.2**) to assess suitability of watercourses and well-connected ponds for water voles, and to search for evidence of their presence. Habitat requirements for water vole focus on shelter (diggable earth banks), aquatic vegetation and reliable access to water. **Volume 3**, **Appendix 9.7** provides survey results of all Autumn 2023 and Spring 2024 surveys in the context of each Site. A brief summary of survey results has been provided below.

9.6.114 The vast majority of surveyed features were assigned either a 'negligible' or 'suitable but poor' category, being mostly narrow and dry, heavily shaded, or with limited water or aquatic/marginal vegetation.

9.6.115 Seven features were characterised as being of 'good' suitability and a further three of 'optimal' suitability, having sufficient water levels, suitable vegetation and diggable banks to support water voles throughout the year. These were limited to one stream at Green Hill A, one pond at Green Hill E, another pond adjacent to Green Hill E but off-site (optimal), three ditches at Green Hill BESS (two optimal), and four ditches at Green Hill F.

9.6.116 During the two surveys, very limited signs of water voles were recorded, as can be seen in **Volume 3**, **Appendix 9.7**. A dead water vole was found at the pond located just off-site near the western boundary of Green Hill E. Feeding remains were also observed along the northeastern boundary of Green Hill BESS. Possible water vole burrows and feeding remains were found along the central north-south ditch at Green Hill C and the northwestern boundary of Green Hill D. However, these were not conclusive.

9.6.117 A possible mink print was recorded at Green Hill E. Mink are voracious predators of water voles and, if present, likely pose a threat to the local water vole population.

9.6.118 Water voles are confirmed to be present at Green Hill E and BESS. Potential evidence of their presence was also recorded at Green Hill C and D, although this was not confirmed. Given water vole populations are in decline nationally, the populations on Site are considered to be of **District Importance**. This evaluation is likely to apply to the Cable Route Search Area on account of the similarity of ditch and watercourse network within it, however this assessment will be revisited following an assessment of the habitats within the Cable Corridor as planned.

*Other Mammals*

9.6.119 Other mammals which are Species of Principal Importance and potentially present on site and capable of being impacted include brown hare *Lepus europaeus*, harvest mouse *Micromys minutus*, hedgehog *Erinaceus europaeus* and polecat *Mustela putorius*.

9.6.120 Twelve records of brown hare were returned within 2km of the Sites, since 2000, dating most recently from 2022. One record pertained to inside Green Hill A. This species is widespread and mobile in the local landscape. Brown hares are ubiquitous across the Sites, observed during various surveys in relatively high numbers within the arable fields and field edges. Not of particular conservation interest in the area, brown hare is considered to be of **Local Importance** in the context of the Site.

9.6.121 A total of 97 records of hedgehogs were returned by the desk study; the most recent record dating from 2022. Records of hedgehogs exist within 2km of each of the Sites and this species is widespread in the local landscape. Hedgehogs are likely to be present across the Sites, especially where there is good habitat connectivity between rough grassland margins, hedgerows and woodland/scrub edges at field boundaries. This mosaic provides suitable foraging, nesting and sheltering opportunities for this species. Given that hedgehog numbers are in decline nationally, this species is considered as being of **Local Importance**.

9.6.122 Three records of polecat were returned within 2km of the Sites, relating to locations in Earls Barton and Holcot, most recently in 2017. This is a small number of records, but polecats are secretive and thus they are unlikely to be encountered (and recorded) often. Following recent population recoveries, this species is expanding in range and is increasingly prevalent in lowland farmland in England. It favours farmland with mature hedgerows and extensive pockets of woodland, and requires good sources of its favoured prey, particularly rabbits, but will also take amphibians, birds and rats. Typical polecat habitat and foraging requirements are well represented across the Scheme and in the local landscape, and as such this species can be assumed to be present. Polecat is likely to be of **Local Importance** in the context of the Site.

9.6.123 No records for harvest mice were returned within the surrounding 2km since 2000, however, harvest mice are small and secretive, so detection is difficult. This species favours rough grassland where there is less disturbance, which, although present across the Scheme, is generally restricted to narrow field margins, hedgerow bases and alongside ditches. Neither harvest mice nor their nests have been observed during site visits. Harvest mice may be assumed to be present in low densities within the arable fields and field margin habitats. This species is therefore considered to be of **Local Importance** in the context of the Site.

9.6.124 Roe deer, Muntjac deer and Chinese water deer have all been observed at the Sites during survey work. No deer species receive special legal protection or are considered priority species of conservation concern. The arable fields are of some value to deer, although typically they would be expected to keep more closely to woodland, pasture and field boundaries. Considering the highly open nature of the Sites' habitats and limited woodland and permanent pasture cover, deer are considered to be of **Site Importance**.

9.6.125 All evaluations are likely to apply to the Cable Route Search Area on account of the similarity of farmland habitats within it, however this will be revisited following further investigation and assessment work within the Cable Corridor.

*Reptiles*

9.6.126 All six of the UK's native reptiles are Species of Principal Importance and receive varying levels of protection under the Wildlife and Countryside Act.

9.6.127 Post-2000, just eight reptile records were returned within 2km of the Sites, comprising: grass snake *Natrix helvetica* (seven) and adder *Vipera berus* (one).

9.6.128 One record of grass snake was returned within 2km of Green Hill B, pertaining to Pitsford Reservoir and dating from 2013.

9.6.129 One record of grass snake was returned within 2km of Green Hill C, pertaining to Mears Ashby and dating from 2022.

9.6.130 One record of grass snake and one record of adder were returned within 2km of Green Hill D and Green Hill E. The adder record pertains to Sywell Reservoir and was made in 2008. The grass snake record pertains to Mears Ashby, just south of the Site, and was made in 2022.

9.6.131 Six records of grass snake were returned within 2km of Green Hill BESS, pertaining to Grendon and Castle Ashby, and dating most recently from 2008.

9.6.132 One record of grass snake was returned within 2km of Green Hill F, pertaining to Castle Ashby and dating from 2008.

9.6.133 No reptile records were returned within 2km of Green Hill A, A.2, or G, post-2000.

9.6.134 The Sites generally comprise poor quality habitat for reptiles, with the arable fields being unsuitable. The chiefly suitable habitats are the grassland and hedgerows at field margins, as well as woodland edges. Heavily grazed grassland fields are likely to be unsuitable, whereas fields with a coarser structure may support species such as slow-worm *Anguis fragilis* or common lizard *Zootoca vivipara*. Ponds and suitably wet ditches may support grass snake.

9.6.135 The desk study data shows a general lack of records for reptile species within 2km of the Sites, and the on-Site habitats are generally unsuitable. For these reasons, specific reptile surveys were not considered proportionate to undertake. However, for the purposes of this assessment, it is assumed that small populations of common reptile species (comprising grass snake, common lizard and slow worm) are likely present in suitable habitats within the Sites.

9.6.136 Considering the restricted extent and suitability of habitats for reptiles, and their likely presence across the Sites at a low or very low density, reptiles are of **Local Importance** in the context of the Scheme. At this stage, this is considered likely to be the case for the Cable Route Search Area until a walkover assessment of habitats within the Cable Corridor is undertaken.

*Amphibians*

9.6.137 Great crested newt *Triturus cristatus* (GCN) and common toad *Bufo bufo* are Species of Principal Importance and palmate newt *Lissotriton helveticus* is listed on the Northamptonshire Biodiversity Action Plan (BAP).

9.6.138 Post-2000, records were returned within 2km of the Sites for: common frog *Rana temporaria* (11 records, most recently in 2021), common toad (12 records, most recently in 2018), smooth newt *Lissotriton vulgaris* (17 records, most recently in 2021) and GCN (43 records, most recently in 2022).

9.6.139 Common frog and common toad records were returned within 2km of all Sites except Green Hill A, C, D and G. Smooth newt records were present within 2km of all Sites except Green Hill F and G. GCN records were returned within 2km of all Sites.

9.6.140 A total of eight EPS mitigation licences relating to GCN have been identified within 2km of the Sites, as follows:

- EPSM2009-1485, 1.8km northeast of Green Hill A, relating to destruction of a resting place;
- 2015-18472-EPS-MIT, 1.8km southwest of Green Hill B, which was amended on three occasions, relating to damage and destruction of a resting place;
- EPSM2013-5464 and 2014-1974-EPS-MIT, 1.5km east of Green Hill C, 0.9km east of Green Hill D and 0.8km north of Green Hill E, relating to the damage and destruction of a resting place;
- 2014-1338-EPS-MIT and 2017-27647-EPS-MIT, 2km northeast of Green Hill C and D, and 1.9km north of Green Hill E, relating to the damage and destruction of a resting place;
- 2018-36758-EPS-MIT, 1.9km northwest of Green Hill BESS, relating to the damage and destruction of a resting place; and
- 2015-10360-EPS-MIT, 0.2km northeast of Green Hill F, which was amended on four occasions, relating to the damage and/or destruction of both resting and breeding places.

9.6.141 The potential for GCN presence was inferred at Green Hill F following the sighting of historic herptile exclusion fencing around the former quarry. This was likely installed as part of a previous translocation exercise under a mitigation licence, ref. 2015-10360-EPS-MIT, as identified by the desk study. During a nocturnal wintering bird survey on 14 February 2024, at least ten GCNs were observed migrating towards breeding ponds, along the trackway separating the northeastern-most parcel from the main body of Green Hill F.

9.6.142 The Sites all offer suboptimal habitat for amphibians in the main, with the arable fields that dominate the Sites providing limited cover and foraging opportunities. The grassland fields, hedgerows and woodland blocks offer the best habitat for amphibians during their terrestrial phases. A small number of ponds lie either within the Sites or surrounding 250m, which could be used by breeding amphibians.

9.6.143 District Licensing will be utilised across the Scheme, which assumes the presence of GCN within local waterbodies and stipulates mitigation and compensation measures to reduce and offset impacts on this species.

9.6.144 Considering the relatively small number of amphibian records, and the general lack of optimal habitat for these species, amphibians are considered to be of **Local Importance**. This evaluation is likely to apply to the Cable Route Search Area, pending further investigation within the Cable Corridor.

*Breeding Birds*

9.6.145 Many bird species are listed as Species of Principal Importance and appear as either green, amber or red-listed species within the RSPB/BTO Birds of Conservation Concern lists. Barn owl and nightingale are listed on the Northamptonshire BAP. All birds and their eggs are protected, while some which appear on Schedule 1 of the Wildlife and Countryside Act are protected further from disturbance while nesting.

9.6.146 A large number of bird records were returned by the data search (32,330), pertaining to 175 different species recorded within the surrounding 2km, since 2000. Of these, records of 80 resident and 27 summer migrant species (which may therefore be present in the UK during the breeding season) were gathered. Not all of these species are likely to be found within the Sites, as many have specific habitat requirements. As such, of the species recorded by the data search, a total of 51 resident and 16 summer migrant species were considered likely or potentially present within the Sites, considering the habitats present.

9.6.147 Notable species considered potentially present were mainly birds typical of farmland habitats such as: corn bunting *Miliaria calandra*, lapwing *Vanellus vanellus*, grey partridge *Perdix perdix*, quail *Coturnix coturnix*, reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, stock dove *Columba oenas,* tree sparrow *Passer montanus,* whitethroat *Sylvia communis,* yellow wagtail *Motacilla flava* and yellowhammer *Emberiza citrinella*. Additional species included cuckoo *Cuculus canorus*, dunnock *Prunella modularis*, finches, hirundines, meadow pipit *Anthus pratensis*, owls, raptors, spotted flycatcher *Muscicapa striata*, starling *Sturnus vulgaris*, thrushes, turtle dove *Streptopelia turtur*, warblers and foraging gulls.

9.6.148 Records of an additional 19 passage species were returned by the data search, two of which (firecrest *Regulus ignicapilla* and wheatear *Oenanthe oenanthe*) were considered to potentially utilise habitats within the Sites.

9.6.149 The Sites comprised chiefly arable habitat, which may be used by a limited number of ground-nesting species for nesting, and by a greater diversity of species for foraging. The discrete areas of permanent grassland may also be used for nesting where not intensively grazed and provide good foraging habitat. The hedgerows and woodland areas provide both nesting and foraging habitat for a wide range of species. Intensively managed fields offer suboptimal habitat for most species, whilst the Sites with more ecologically sensitive farming systems and greater habitat heterogeneity will support a greater range of species and likely a greater density of birds.

9.6.150 To date, based on a preliminary analysis of data from breeding bird survey visits 1-3 only, a total of 100 different species have been recorded. These are chiefly a mix of widespread, generalist species of hedgerows and woodland, as well as arable specialists. In addition to these species, several birds of prey, warblers and hirundines (swifts, swallows and martins) have been recorded, alongside a small number of wildfowl and wetland birds associated with streams, ponds and offsite waterbodies.

9.6.151 Ground-nesting species such as skylark and grey partridge were recorded across all nine of the Sites, with skylarks present in good numbers. Lapwings were recorded likely breeding at Green Hill A, B and G. Yellow wagtail was restricted to Green Hill B, E, F and G. Quail were only recorded at Green Hill A.

9.6.152 Detailed territory analysis suggests that there are 281 skylark territories present within the Sites, although surveys at Green Hill A.2 are not yet completed, and so this number may change. The largest of the Sites, Green Hill A, E and F, appeared to support the most skylarks, with 53, 73 and 61 singing males respectively. Green Hill A appears to support the densest number of territories: 0.31 territories/ ha. Green Hill BESS supports no skylark territories and therefore has the least dense population.

9.6.153 Species typically associated with boundary habitats were recorded consistently across the Sites, with distribution patterns largely influenced by their specific ecological requirements, such as yellowhammer and linnet utilising vegetation boundaries (e.g. hedgerow, scrub) whilst nesting in hedgerows, and reed bunting nesting within ditch habitats/margins and feeding within arable crops. Bullfinch were recorded at all of the Sites, whereas corn bunting were only recorded at Green Hill A.

9.6.154 Wetland species were restricted to the on-site ponds, larger streams and ditches at the boundaries, and were also recorded in nearby off-site waterbodies. Principal locations included the on-site pond at Green Hill B, and ditches at the boundaries of Green Hill F and BESS. Here, species such as Cetti's warbler *Cettia cetti*, kingfisher *Alcedo atthis*, little egret *Egretta garzetta*, mallard *Anas platyrhynchos*, teal *Anas crecca* and tufted duck *Aythya fuligula* were recorded. Offsite nearby to Green Hill BESS and F, additional species were recorded, including bittern *Botaurus stellaris*, cuckoo, coot *Fulica atra*, gadwall *Anas strepera* and little grebe *Tachybaptus ruficollis*.

9.6.155 Several notable birds of prey were noted on site during breeding surveys, including barn owl Tyto alba, hobby *Falco subbuteo*, kestrel *Falco tinnunculus*, osprey *Pandion haliaetus*, peregrine *Falco peregrinus*, red kite *Milvus milvus*, sparrowhawk *Accipiter nisus* and tawny owl *Strix aluco*. Barn owls nest in buildings or trees with suitably large cavities, but will range up to ~1km from the best to forage (Ref.49); this species was only recorded at Green Hill C and BESS. Peregrines nest on

cliffs or tall structures (Ref.50) and were only recorded at Green Hill C, BESS and F. Hobby, osprey and red kite nest in tall trees or artificial nesting structures (Ref.50). A hobby nest was also considered likely to be present at Green Hill F; pairs were also observed at Green Hill B and E. Kestrel, sparrowhawk and tawny owl are less likely to be restricted in terms of their nesting requirements, compared to the other raptor species. Breeding within the Sites was either confirmed, or is considered likely, for hobby, kestrel, sparrowhawk and tawny owl.

9.6.156 Please refer to **Volume 3**, **Appendix 9.11** for additional confidential information regarding Schedule 1 species.

9.6.157 Species listed under Schedule 1 of the Wildlife and Countryside Act receive additional protection from disturbance when nesting. Such species recorded on the Sites include barn owl, Cetti's warbler, hobby, osprey, peregrine, quail and red kite. Consideration will need to be given to timing of works and buffer zones from any established nests during the construction phase.

9.6.158 Following preliminary survey data analysis, the breeding bird species assemblage appears to differ between the Sites owing to the differences in habitat and management, but with certain species found consistently. Habitat diversity, field size and land-use all affect the overall value of any given land-parcel to breeding birds, as well as the breeding bird assemblage recorded during the surveys completed to date.

9.6.159 Species recorded on or adjacent to the Sites considered most vulnerable to habitat loss and change impacts would be ground-nesting species of open habitats, principally lapwing, skylark and yellow wagtail, as they almost exclusively nest within the arable and cultivated fields and require long, unbroken sightlines for predator avoidance. Common quail are also mostly associated with open fields but are potentially at a lesser risk given their use of boundary habitats for nesting.

9.6.160 At present, given the similarity of the habitats on Site with those in the surrounding area, the likelihood is that the breeding bird assemblage on Site is mostly typical of the surroundings, save for some notable species which may be more localised, such as corn bunting, grasshopper warbler *Locustella naevia*, lapwing, osprey, quail and yellow wagtail. The abundance of skylark, grey partridge and yellowhammer at several of the Sites is also notable. Overall, the assemblage of breeding birds within the Scheme is considered to be of **District Importance** in the context of the Sites. At this stage, this is considered likely to be the case for the Cable Route Search Area until a walkover assessment of habitats within the Cable Corridor can be made as planned. In the impact assessment a differentiation will be made between ground nesting birds of open habitat and other species.

*Overwintering Birds*

9.6.161 Many bird species are listed as Species of Principal Importance and appear as either green, amber or red-listed species within the RSPB/BTO Birds of Conservation Concern lists. Barn owl is listed on the Northamptonshire BAP. All birds and their eggs are protected.

9.6.162 The Nene Upper Valley GP SPA/SSSI lies within 10km of Green Hill B, C, D, E, BESS, F and G. This site is designated for its overwintering wader and wildfowl populations, notably golden plover.

9.6.163 A large number of bird records were returned by the data search (32,330), pertaining to 175 different species recorded within the surrounding 2km, since 2000. Of these, records of 80 resident and 40 winter migrant species (which may therefore be present in the UK during the wintering season) were gathered. Not all of these species are likely to be found within the Sites, as many have specific habitat requirements. As such, of the species recorded by the data search, a total of 51 resident and 11 winter migrant species were considered likely or potentially present within the Sites, considering its habitats.

9.6.164 Notable species considered potentially present were mainly farmland birds such as: corn bunting, lapwing, grey partridge, reed bunting, skylark, stock dove, tree sparrow and yellowhammer. Additional species included dunnock, finches, geese, gulls, meadow pipit, owls, raptors, starling, thrushes and waders.

9.6.165 An additional 19 passage species were recorded by the data search, two of which were considered may use the Sites. These were: firecrest and wheatear.

9.6.166 The large majority of the Sites were managed as autumn or winter sown arable, with a smaller proportion of fields containing permanent grassland/grazed pasture. A number of agri-environmental schemes were in place across several of the Sites, and thus overwinter stubbles were present in several fields, which are of greater interest to overwintering birds for foraging purposes.

9.6.167 From the diurnal and nocturnal wintering bird surveys completed to date, a total of 84 different species have been recorded. There is a core subset of regularly recorded species, and additional species with a reduced number of observations. Fewer than ten observations of 25 species have been recorded. At the opposite end of the spectrum, over 1000 observations of seven different species have been recorded.

9.6.168 Preliminary wintering bird survey results indicate that the Sites are of some value to skylarks, finches, buntings, winter thrushes, grey partridge, waders and wildfowl. In the main, the Sites are unlikely to be of elevated value above that of neighbouring land in the local landscape. However, the presence of winter stubbles and margins at the sites implementing agri-environmental schemes does render those sites of higher value in terms of foraging and sheltering opportunities for wintering birds. Dense hedgerows which are left uncut until spring provide better shelter and foraging resources, such as berries. Additionally, the presence of marginal shelter belts, wild bird food strips, tussocky grassland and game cover provide enhanced shelter and foraging resources compared to the open arable fields.

9.6.169 Species of open fields were present in mixed numbers and diversity across the Sites. During winter, some birds will roam widely in search of prey and take advantage of ephemeral resources, moving on once a field is depleted of spilled grain, for example. The patchy nature of records reflects this behaviour. However, trends were present across the Sites, whereby particular sites appeared to support a greater diversity and abundance of species than other sites.

9.6.170 Skylark were abundant across the Sites, although Green Hill E supported large flocks throughout the year, as well as Green Hill A and F, whilst Green Hill C supported the lowest numbers. Meadow pipit were recorded in relatively low numbers across the Sites, which is likely a result of there being a limited abundance of grassland habitats within the Scheme.

9.6.171 Grey partridge were observed across all Sites. Rook were recorded in the greatest numbers at Green Hill B, D and F. A modest flock of stock dove was recorded consistently at Green Hill E, as well as a large flock of woodpigeon (400 birds). Starling flocks were largest at Green Hill A, E and F, with up to 500 birds in a single flock.

9.6.172 A large, mixed flock of geese was recorded at Green Hill E in November 2023 – comprising approximately 130 Canada geese and 300 greylag geese. Otherwise, in general, low numbers of waders and wildfowl were observed across the Sites, including individuals/small groups of mallard, moorhen, gadwall, snipe and wigeon. Modest flocks (up to 43 birds) of lapwing were observed at Green Hill E and F.

9.6.173 Several large flocks of black-headed, common and herring gulls were observed on different occasions at Green Hill A, C and E. In terms of raptors, various owl and raptor species were recorded hunting or scavenging. Notably, a single merlin was recorded at Green Hill E.

9.6.174 Several notable species were recorded using boundary habitats. Bullfinch were recorded in low numbers at all Sites, whilst dunnock were widespread and recorded in typical numbers for the habitats present. Reed bunting were present in modest numbers only, mainly at Green Hill A, E and F. Large flocks of fieldfare were observed at Green Hill A, B, E and F, whilst redwing were observed in modest numbers across the Sites. Good numbers of finches were observed, including flocks of up to 30 goldfinch, 80 greenfinch and 250 linnet, chiefly at Green Hill E.

9.6.175 With respect to golden plover and the Upper Nene Valley Gravel Pits SPA, preliminary wintering bird survey results indicate that the Sites support very few golden plover over winter. During nocturnal surveys, just a single individual was recorded at Green Hill E, and three more individuals were heard offsite adjacent to Green Hill E and BESS. Diurnal surveys also revealed very few

golden plover using the Sites; the peak count was 24 birds at Green Hill F in January 2024. Golden plover are, however, present in greater numbers in the wider landscape; a flock of 70 birds was observed flying northwards off-site adjacent to Green Hill D in November 2023, but were not observed using the Site itself.

9.6.176 Aside from golden plover, notable records from the nocturnal wintering bird surveys included barn owl and jack snipe at Green Hill B, C, E and F; snipe at Green Hill B, E and F; lapwing at Green Hill B, E and F; long-eared owl at Green Hill E, little owl at Green Hill E and F; short-eared owl at Green Hill F; teal at Green Hill F; tawny owl at Green Hill BESS and F; and woodcock at Green Hill B-F, with the greatest numbers at Green Hill E.

9.6.177 Overall, Green Hill A, E and F appear to have elevated importance for wintering birds above the other Sites. In the round, it is considered likely that the assemblage of wintering birds across all the array sites is of **District Importance** in the context of the Scheme. At this stage, this is considered likely to be the case for the Cable Route Search Area until a walkover assessment of habitats within the Cable Corridor can be made as planned.

*Invertebrates*

9.6.178 Black hairstreak and lime bark beetle appear on the Northamptonshire BAP.

9.6.179 A total of 15,411 records of insects exist within 2km of the Sites since 2000. These pertain to 282 different species, including beetles, true flies, hymenopterans (bugs), butterflies and moths. The vast majority of records (15,023) relate to moths, of some 228 species. No records of either of the Northamptonshire BAP species, mentioned above, were identified.

9.6.180 A single record of white-clawed crayfish *Austropotamobius pallipes* was returned, pertaining to Earls Barton Bends and dating from 2008. None of the streams or ditches present on or directly adjacent to the Sites are considered to provide optimal habitat for this species, which prefers shallow, rocky and mineral-rich watercourses/ waterbodies. A single observation of invasive American signal crayfish *Pacifastacus leniusculus* was also made at Green Hill F during the otter and water vole surveys. The presence of this species significantly reduces the likely presence of a healthy population of white-clawed crayfish, due to the American signal crayfish carrying crayfish plague and outcompeting the more diminutive white-clawed crayfish. Taking this into consideration, the presence of white-clawed crayfish within the Sites is considered unlikely, although cannot be ruled out.

9.6.181 A single record of large black slug *Arion ater* was gathered, pertaining to Sywell Reservoir and Country Park, and dating from 2003.

9.6.182 A Bug Life B-lines area was identified off-site, approximately 0.12km from Green Hill G.

9.6.183 The principal habitats present at the Sites are arable fields bounded by hedgerows of mixed quality, with wet ditches, streams, ponds, woodland and grassland being rarer habitats. Considering their regular maintenance in the form of trimming and dredging, together with likely overspray and run-off of pesticides and other treatments, the network of boundary hedgerows, margins and drainage ditches are most likely to support only common invertebrate assemblages typical of the local arable farming landscape. For these reasons, as well as the fact that embedded mitigation measures will ensure that potential impacts on these species groups are largely avoided, it was not considered proportionate to carry out aquatic or terrestrial invertebrate surveys.

9.6.184 The most important habitats for invertebrates within the Sites are likely to be discrete, well-structured species-rich hedgerows, as well as species-rich grassland and ponds. Ancient woodland and better-quality watercourses at the site boundaries, such as those at Green Hill BESS, are also likely to be valuable. These habitats may support individual notable species/ species of conservation concern, including those identified by the desk study. Embedded mitigation measures will ensure that potential impacts on any such species are avoided.

9.6.185 For the purposes of the preliminary assessment in this PEIR Chapter, and on a precautionary basis, it is assumed that the Invertebrate assemblage within the solar array Sites and Cable Route Search Area is of **Local Importance**.

*Plants*

9.6.186 Black poplar and Plot's elm appear on the Northamptonshire BAP.

*9.6.187* Notable plant records gathered within 2km of the Sites since 2000 included the following species: Scots pine *Pinus sylvestris*, bird's-nest orchid *Neottia nidus-avis*, bluebell *Hyacinthoides non-scripta,* box *Buxus sempervirens*, cat-mint *Nepeta cataria*, corn marigold *Glebionis segetum*, corn mint *Mentha arvensis*, corn spurrey *Spergula arvensis*, dwarf spurge *Euphorbia exigua*, field scabious *Knautia arvensis*, fringed water-lily *Nymphoides peltata*, galingale *Cyperus longus*, good-king-Henry *Blitum bonus-henricus*, green-winged orchid *Anacamptis morio*, heath spotted orchid *Dactylorhiza maculata*, hoary plantain *Plantago media*, hound's-tongue *Cynoglossum officinale*, large-leaved lime *Tilia platyphyllos*, marsh ragwort *Jacobaea aquatica*, mudwort *Limosella aquatica*, navelwort *Umbilicus rupestris*, quaking-grass *Briza media*, ragged-robin *Silene flos-cuculi*, scarce redshank moss *Ceratodon conicus*, shrubby cinquefoil *Potentilla fruticosa*, smooth brome *Bromus racemosus*, stinking chamomile *Anthemis cotula*, tormentil *Potentilla erecta*, water-soldier *Stratiotes aloides*, wavy hair-grass *Deschampsia flexuosa*, wild strawberry *Fragaria vesca*, wood horsetail *Equisetum sylvaticum* and wood-sorrel *Oxalis acetosella.*

9.6.188 The habitats on site are considered typical in diversity and quality for their surroundings, with arable habitats being dominant, and grassland, woodland and aquatic habitats being rarer.

9.6.189 All fields within the Scheme where agri-environmental schemes were in place were surveyed for arable weeds (Ref.51). Following the survey, the importance of each fields arable weed assemblage was then assessed using the Plantlife methodology (Ref.52). Several arable weed species were recorded within the Sites, including: black-grass *Alopercurus myosuroides*, scarlet pimpernel *Anagallis arvensis*, smooth tare *Vicia tetrasperma*, rye brome *Bromus secalinus*, many-seeded goosefoot *Lipandra polysperma*, round-leaved fluellen *Kickxia spuria*, field pansy *Viola arvensis*, small-flowered crane's-bill *Geranium pusillum*, false cleavers *Galium spurium* and black mustard *Brassica nigra*. Indicator species are assigned a score based on their rarity, and the total score for the field serves as a measure of the importance of the assemblage of arable weeds present within a particular field. Fields AF1, AF23, AF28, EF23, EF30 and FF4 each had a score of greater than 11, with EF30 having the highest score of 18. However, the threshold score to qualify for an arable weed assemblage of County importance (greater than 20) was not met. The arable weed assemblages in all of these fields were therefore assigned Local importance. Additional notable arable weeds were recorded incidentally during other surveys, and included slender tare *Vicia parviflora*, sharp-leaved fluellen *Kickxia elatine* and dwarf spurge *Euphorbia exigua* (a notable species returned by the data searches).

9.6.190 Several grassland fields were assessed as being 'other neutral grassland'. These have a higher botanical diversity and constitute the most likely areas to support notable plant species within the Sites. Some of the species recorded by the desk study may be present in these fields.

9.6.191 Given the presence of habitats with elevated botanical interest, the Sites are considered to be of Local Importance for notable plants. Pending further investigation, the botanical interest of the Cable Route Search Area is given **Local Importance** until an assessment can be made within the Cable Corridor.

*Freshwater Fish*

9.6.192 No fish records were returned by the desk study within 2km of the Sites since 2000, although three records of spined loach *Cobitis taenia* (a Species of Principal Importance) outside of 2km from any of the Sites were returned.

9.6.193 Open-source fish data from the Environment Agency were gathered from 2km of each of the Sites. These data revealed records of the following species in these areas, since 2000: barbel *Barbus barbus,* bleak *Alburnus alburnus*, common bream *Abramis brama*, brown / sea trout *Salmo trutta,* bullhead *Cottus gobio*, chub *Leuciscus cephalus*, dace *Leuciscus leuciscus,* European eel *Anguilla Anguilla,* gudgeon *Gobio gobio*, minnow *Phoxinus phoxinus,* nine-spined stickleback *Pungitius pungitius,* perch *Perca fluviatilis,* pike *Esox Lucius,* roach *Rutilus rutilus*, rudd *Scardinius erythrophthalmus,* ruffe *Gymnocephalus cernuus,* silver bream *Abramis*

*bjoerkna*, spined loach *Cobitis taenia,* stone loach *Barbatula barbatula,* tench *Tinca tinca,* three-spined stickleback *Gasterosteus aculeatus* and several hybrids, plus unidientifed fish in the families/ genera: Cobitidae, Cottidae, Cyprinidae, Gasterosteidae, Noemacheilus and Phoxinus.

9.6.194 Watercourses present at the Sites have wider connectivity with the River Nene and its tributaries, and may also be used by migratory species, such as European eel and brown trout. However, considering the nature of the proposals, it has not been considered appropriate to conduct detailed surveys for freshwater fish.

9.6.195 The presence of freshwater fish is assumed within principal watercourses including the River Nene, and suitably large and wet feeder streams. Consequently, these species are considered to be of **Local Importance** in the context of the Site's dominance by arable habitats.

*Invasive Species*

9.6.196 Records indicate the presence of Chinese water deer *Hydropotes inermis*, Virginia-creeper *Parthenocissus quinquefolia*, Japanese knotweed *Reynoutria japonica*, orange balsam *Impatiens capensis* and Nuttall's waterweed *Elodea nuttallii* within 2km of the Sites, since 2000.

9.6.197 Chinese water deer and Muntjac deer *Muntiacus reevesi* have been observed during various surveys of the Sites. In addition, an American mink *Neovison vison* was observed at Green Hill E and American signal crayfish *Pacifastacus leniusculus* at Green Hill F during otter and water vole surveys.

9.6.198 No observations of any other invasive non-native species have been made during any of the fieldwork carried out to date. Species particularly closely looked for were Himalayan balsam *Impatiens glandulifera*, Japanese knotweed and giant hogweed *Heracleum mantegazzianum*.

9.6.199 Further surveys are ongoing, and any such incidental sightings will be noted, including within the Cable Corridor.

9.6.200 It is illegal to release or cause the dispersal of invasive non-native species and therefore they will be considered within the impact assessment as a non-IEF included in light of legal obligations.

**Preliminary Ecological Evaluation Summary**

9.6.201 **Table 9.14** summarises the Preliminary Ecological Evaluation. All features considered Important Ecological Features will be carried through to the assessment of effects.

**Table 9.14: Summary of Preliminary Ecological Evaluation**

| Ecological Feature | Importance | IEF? |
|---|---|---|
| Upper Nene Valley Gravel Pits Ramsar/SPA | International | Yes |
| Badsaddle, WIthmale Park and Bush Walk Woods SSSI | National | Yes |
| Birch Spinney and Mawsley Marsh SSSI | National | Yes |
| Bozeat Meadow SSSI | National | Yes |
| Dungee Corner Meadow SSSI | National | Yes |
| Hardwick Lodge Meadow SSSI | National | Yes |
| Odell Great Wood SSSI | National | Yes |
| Pitsford Reservoir SSSI | National | Yes |
| Upper Nene Valley Gravel Pits SSSI | National | Yes |
| Wollaston Meadows SSSI | National | Yes |
| Yardley Chase SSSI | National | Yes |
| Crowfields Common LNR | National | Yes |
| Glamis Meadow and Wood LNR | National | Yes |

| Ecological Feature | Importance | IEF? |
|---|---|---|
| Harrold Odell Country Park LNR | National | Yes |
| Lings Wood LNR | National | Yes |
| Scrub Field LNR | National | Yes |
| Summer Leys LNR, LWS | National | Yes |
| Nun Wood CWS | County | Yes |
| Templegrove Spinney CWS | County | Yes |
| The Slipe CWS | County | Yes |
| Bozeat Cemetery LWS | County | Yes |
| Bozeat Glebe Meadow LWS | County | Yes |
| Bozeat Verge LWS | County | Yes |
| Bozeat Wood LWS | County | Yes |
| Broughton Green Lane LWS | County | Yes |
| Castle Ashby Parkland LWS | County | Yes |
| Castle Ashby Woodland LWS | County | Yes |
| Cold Oak Copse LWS | County | Yes |
| Cowpasture Spinney LWS | County | Yes |
| Earl's Barton Carr LWS | County | Yes |
| Earls Barton Lock Lake LWS | County | Yes |
| Earls Barton Meadow LWS | County | Yes |
| Ecton Gravel Pits LWS | County | Yes |
| Engine Pond LWS | County | Yes |
| Grendon Lakes LWS | County | Yes |
| Grendon Lakes North LWS | County | Yes |
| Grendon Quarter Pond LWS | County | Yes |
| Hardwater Meadows LWS | County | Yes |
| Hardwick Road Verge LWS | County | Yes |
| Hardwick Wood LWS | County | Yes |
| Highcroft Farm Meadow LWS | County | Yes |
| Hog Hole Spinney LWS | County | Yes |
| Horn Wood LWS | County | Yes |
| Lavendon Wood LWS | County | Yes |
| Long Furlong and Old Pastures LWS | County | Yes |
| Menagerie Pond LWS | County | Yes |
| Old Poors Gorse LWS | County | Yes |
| Par Pond LWS | County | Yes |
| Park Farm Industrial Estate LWS | County | Yes |
| Scotland Pond LWS | County | Yes |
| Sywell Reservoir and Country Park LWS | County | Yes |

| Ecological Feature | Importance | IEF? |
|---|---|---|
| The Basin LWS | County | Yes |
| Threeshire's Wood LWS | County | Yes |
| Vivians Covert LWS | County | Yes |
| Walgrave East Meadow LWS | County | Yes |
| Warren Ponds LWS | County | Yes |
| Wilby Meadows Stream LWS | County | Yes |
| Wilby Way Meadows LWS | County | Yes |
| Yardley Brook Field LWS | County | Yes |
| Pitsford Water WTR | County | Yes |
| Arable fields (cereal crops; non-cereal crops; temporary grass and clover leys; winter stubble) | Site | No |
| Arable field margins (game bird mix; pollen and nectar; tussocky) | Local | Yes |
| Modified grassland | Site | No |
| Other neutral grassland | Local | Yes |
| Scrub (blackthorn scrub; bramble scrub; mixed scrub) | Site | No |
| Woodland (other woodland; broadleaved; and other woodland; mixed) | Local | Yes |
| Rural trees | Local | Yes |
| Ancient/ veteran trees | District | Yes |
| Ponds (priority habitat) | District | Yes |
| Ruderal/ephemeral | Site | No |
| Tall forbs | Site | No |
| Artificial unvegetated, unsealed surface | Negligible | No |
| Bare ground | Negligible | No |
| Developed land; sealed surface | Negligible | No |
| Hedgerows (native hedgerow; native hedgerow – associated with bank or ditch; native hedgerow with trees; native hedgerow with trees – associated with bank or ditch; species-rich native hedgerow; species-rich native hedgerow – associated with bank or ditch; species-rich native hedgerow with trees; species-rich native hedgerow with trees – associated with bank or ditch) | Local | Yes |
| Lines of trees (line of trees; line of trees – associated with bank or ditch) | Local | Yes |
| Ditches | Local | Yes |
| Other rivers and streams | District | Yes |
| Badger | Local | Yes |
| Bats | Local | Yes |
| Otter | Local | Yes |

| Ecological Feature | Importance | IEF? |
|---|---|---|
| Water vole | District | Yes |
| Brown hare | Local | Yes |
| Hedgehog | Local | Yes |
| Polecat | Local | Yes |
| Harvest mouse | Local | Yes |
| Deer | Site | No |
| Reptiles | Local | Yes |
| Amphibians | Local | Yes |
| Breeding birds | District | Yes |
| Overwintering birds | District | Yes |
| Invertebrates | Local | Yes |
| Plants (including Arable Weeds) | Local | Yes |
| Freshwater fish | Local | Yes |
| Invasive species | Negligible | No, but included in Impact Assessment for legal reasons |

## Future Baseline

9.6.202 This section considers changes to the 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. The future baseline scenarios are set out in **Chapter 2: EIA Process and Methodology**.

9.6.203 In the absence of the Scheme, it is anticipated that the Sites would remain in arable production, with associated intensive management regimes. Such intensive systems are predicted to entail the continued requirement for additional soil inputs and conditioners, with potential negative implications for wildlife.

9.6.204 Additionally, climate change is set to pose new challenges for both farming and wildlife, with less predictable and more extreme weather.

9.6.205 Given these predicted future pressures, the valuation of importance of the IEFs present within the Sites is likely to remain the same or to decrease.

### Designated Sites

9.6.206 The future baseline conditions for designated sites would remain broadly unchanged, as future development would be expected to adhere to relevant legislation and policy to ensure adverse impacts are avoided. Climate change may however impact the habitats and/or species for which the sites are designated.

### Habitats

9.6.207 The future baseline conditions for habitats would remain broadly unchanged, although continued use of intensive arable systems may further degrade the soil and thereby the quality of the habitats. Climate change may also have adverse impacts on habitats, especially with less regular weather and climate patterns; extremes of temperature, drought and flooding could all degrade habitat quality.

### Species

9.6.208 The future baseline conditions for certain species may change. Future development would be expected to adhere to relevant legislation and policy to ensure adverse impacts are avoided in

the main, but there may be residual impacts on particular species. Climate change may also have adverse impacts on various species, especially with less regular weather and climate patterns; extremes of temperature, drought and flooding could all impact food availability and breeding success.

## 9.7 Embedded Mitigation Measures and Potential Sources of Impact

### Potential Sources of Impact

9.7.1 The CIEEM guidance draws a necessary distinction in Ecological Impact Assessment between 'impacts' and 'effects'. An 'impact' is an action resulting in changes to an ecological feature, whereas an 'effect' is the outcome to an ecological feature from an impact.

9.7.2 The following potential sources of ecological impacts during the construction, operation and maintenance, and decommissioning phases of the scheme are discussed in this section to provide context in the preliminary assessment of effects. The examples given are not exhaustive.

**Construction Phase**

9.7.3 Construction phase impacts may include:

- Habitat Loss and Habitat Change: Limited habitat loss (for example at hedgerows) may occur where access for construction and operation is required, where existing field accesses cannot be used or need to be widened. Other examples include clearance to facilitate any permanent hardstanding such as foundations or footings. Habitat change will principally be associated with the reversion of arable fields to grassland and other habitats through management, as well as habitat creation where valuable habitat creation opportunities are identified.
- Killing and Injury: Habitat clearance and the actions of vehicles and plant during construction has the potential to cause direct harm to species.
- Fragmentation: Described by CIEEM as, "The breaking up of a habitat, ecosystem or land-use type into smaller parcels with a consequent impairment of ecological function". Potentially in combination with habitat loss and habitat change, fragmentation can reduce the function of a habitat as well as impede the ability of a species to disperse and maintain a viable population. Installation of fencing or culverting streams may also cause fragmentation, as well as through excessive light and noise disturbance.
- Disturbance: Pressures or changes in the environment acting on individuals of a species so as to alter their behaviour may arise through noise, movement and vibration during construction operations, as well as increased human presence.
- Pollution and Habitat Degradation: Release of chemical, sediment or dust pollution can interfere with the normal function of habitats and directly harm species, while processes such as erosion, compaction and alteration of soil/water chemical composition cause the degradation of habitat quality. The construction phase risks the release of pollutants through vehicle and plant movement/operation as well the introduction of new materials onto and into the soil. Protection of sensitive features will be important in safeguarding them throughout the life of the scheme.
- Habitat Creation and Enhancement: The creation of new woodland, grassland, hedgerow and wetland habitats on site will increase the quantum of these habitats available in the Sites. Additionally, the enhancement of retained habitats through development-free buffer zones and increased habitat connectivity will increase the quality and permeability of the Sites to different species. Creation/ installation of habitat features, such as artificial nesting boxes or wood piles, will also increase the availability of nesting/ roosting/ sheltering sites for different species. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs.

**Operational Phase**

9.7.4 Operational phase impacts may include:

- Habitat Loss and Habitat Change: Significant impacts from these are not anticipated as operation will be largely benign, unless major unexpected maintenance or repair events are required following damage to infrastructure. Routine replacement of panels and batteries at the end of their lifespan would not be expected to entail habitat loss or change, since the supporting infrastructure (panel frame and BESS compound) will already be in place and materials would be transported using established access routes. Ongoing habitat maintenance will seek to ensure favourable condition and enhancement of all newly created and retained habitat for the life of the Scheme. Ecological habitat and species monitoring will be key to realising this.
- Killing and Injury: Routine operational works are unlikely to give rise to these effects, although there is the risk of direct harm to species from the movement of vehicles around the Sites (including during the replacement of panels and batteries during the lifetime of the Scheme), or the trapping of certain species within the fencing or fenced area.
- Fragmentation: The presence of a solar farm is anticipated to be habituated to by most mobile species, especially with the creation of new, and enhancement of retained, habitats. However, such impacts will vary between species groups, for example migrating birds and bats may interact with or be perturbed by the surfaces of the solar array, therefore this should also be considered. Typical perimeter fencing is not considered to impede the movement of most mammals, which may continue to move through, beneath or potentially over fencing although movement of deer is likely to be impacted.
- Disturbance: Operational disturbance may occur through the routine movement of vehicles and personnel on site (including during the replacement and regular maintenance of panels and batteries during the lifetime of the Scheme), as well as the presence of low-level noise associated with electrical equipment. Light reflection and glare may be another factor.
- Electro-magnetic Fields (EMFs): The potential for effects of anthropogenic EMFs on ecology is an emerging and poorly researched issue. It is feasible that EMFs emanating from electrical cables could impact certain species which utilise naturally generated EMFs (for instance for navigation), although to date there is very little evidence of significant behavioural changes from EMFs generated by electric cables. The size of generated fields are highly contingent on geometry, voltage and current, and it is considered that EMFs associated with the higher voltage export cable are more likely to risk impacts than those potentially emanating from interconnecting cables across the Scheme. All electrical cables associated with the Scheme are expected to be buried underground; buried cables typically have their electric fields fully attenuated by cable sheathing and the substrate under which they are buried. However, magnetic fields and induced electric fields are not necessarily attenuated in this way, and there lies a risk of effects on receptive wildlife species, particularly on a number of fish or invertebrate species which are known to have evolved sensitivity to electric and/or magnetic fields. In terms of terrestrial species, it is important to note that there is no evidence to suggest that typical solar array infrastructure can cause impacts and, due to the burial, sheathing and relatively low voltage of cabling within generating stations, the overall risk of EMFs resulting in significant effects on terrestrial wildlife is considered highly unlikely. There is some risk of EMFs affecting fish in the vicinity of the 400-132kV cables (i.e. where the cable is required to cross beneath watercourses). Consequently, the potential effects of this will be assessed within the ES, particularly while the relationship between EMFs and aquatic wildlife remains poorly understood.
- Pollution and Habitat Degradation: The risk of these impacts during operation are overall very low, especially where good maintenance practice is followed to avoid further pollution events or degradation of adjacent habitats. Pollution risks also extend to include impacts resulting from fire management, in the unlikely event this were to occur. Risks are further increased around battery energy storage infrastructure, as the water used on surrounding habitats to control fire may create a source of contaminated fire water runoff into

surrounding water bodies, without appropriate drainage and pollution control allowed for at the design stage. Potential impacts relating to contaminated water will be addressed specifically in **Chapter 10: Hydrology, Flood Risk and Drainage**, and **Chapter 22: Ground Conditions and Contamination**. Measures to mitigate impacts from fire will be detailed within an Outline Battery Safety Management Plan and the Operational Environmental Management Plan (OEMP).

- Habitat Creation and Enhancement: Ecological benefits can be maximised through the implementation of a habitat management and monitoring scheme for the life of the development. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs, where the Scheme remains operational across multiple decades.

**Decommissioning Phase**

9.7.5 Considering the anticipated 60-year lifespan of the Scheme, the accurate prediction of decommissioning effects is challenging and can only be informed by the legal, policy and conservation constraints and priorities present at the time of application. Measures to mitigate impacts will be set out within a Decommissioning Environmental Management Plan (DEMP), which will be approved, and reflect best practice, at the time of decommissioning.

- Habitat Loss and Habitat Change: It is assumed that the fields will be able to be returned to agricultural use upon decommissioning, therefore this habitat change will need to be considered, including impacts on any newly created habitats.
- Killing and Injury: As per the construction phase, risks of direct harm to species should be considered.
- Habitat Fragmentation: While the removal of development infrastructure as a reversal of the construction phase is unlikely to result in habitat fragmentation, the reversion to agriculture may impact connectivity between habitats networks and species populations, which have arisen as a result of the Scheme.
- Disturbance: Disturbance impacts are likely to be the same as those described within the construction phase.
- Pollution and Habitat Degradation: Pollution and habitat degradation risks are likely to be the same as the construction phase.

**Embedded Mitigation Measures**

9.7.6 Following the identification of potential sources of impact above, embedded mitigation measures are considered below. These will be considered as part of the assessment of potential effects.

9.7.7 The following embedded mitigation measures for all phases of the Scheme have been incorporated into the Scheme design, with detailed proposals and locations to be submitted with the DCO application.

**Embedded Construction Phase Mitigation Measures**

9.7.8 The Scheme has been designed to retain the most valuable habitats and protect these with undeveloped buffer zones during construction and decommissioning and through the operation of the Scheme. Similarly, habitats with particular importance for protected/notable species, even if the habitats are of low importance in themselves, will be retained outside the development area, where appropriate, to avoid impacts.

9.7.9 Buffers from field boundary habitats have been recommended according to a set of ecological importance criteria. Buffers are measured from the outer edge of the hedgerow, root protection area of the tree canopy (in the case of woodland or individual trees) or the banktop of the watercourse. Buffers will not contain any array structures, hard standing or electrical hardware. Protected construction-phase fencing will also observe these buffer distances. The draft layout of ecological buffers is provided in **Volume 3**, **Appendix 9.10**. The measurement criteria are as follows:

- 8m minimum from ditches and any trees with 'low' suitability for roosting bats.
- 10m minimum from ditches with signs of water vole, or trees with 'moderate' suitability for roosting bats.
- 15m minimum from all hedgerows, minor watercourses (small streams), 'outlying' badger setts and from any tree with 'high' suitability for roosting bats.
- 20m minimum from woodland, ponds and moderate watercourses (depending on ecological value).
- 30m minimum from ancient woodland, major watercourses (e.g. rivers) and 'main', subsidiary' or 'annexe' badger setts.
- Other, bespoke buffers around bat roosts and the nesting sites of Schedule 1 birds will be implemented on a case-by-case basis, taking into account the specific species' requirements.

9.7.10 Within the above-mentioned buffer zones, habitat management options to provide net gains for biodiversity will be agreed and set out within the finalised Landscape and Environmental Management Plan (LEMP).

9.7.11 An Outline Construction Environmental Management Plan (CEMP) will be produced to accompany the Environmental Statement. The CEMP will detail measures and approaches to be adopted which will limit the likelihood of impacts upon retained habitats through damage, pollution and disturbance during the construction phase in order to achieve the objectives set out in the Environmental Statement (and this PEIR). The CEMP is intended to be followed by those responsible for the construction of the Scheme. The CEMP will contain (among others) the following provisions:

- Detail on the location and specification of temporary and permanent protective fencing to be installed prior to the onset of construction. It is anticipated that the specified buffer zones will drive these locations.
- Restrictions on the use of fuels and other contaminants in proximity to boundary features and other sensitive habitats.
- Measures to limit dust-generating activities, such as when working in dry conditions.
- Measures to limit the mobilisation of sediments and run-off, such as when working in very wet conditions or the use of silt fencing when working in ditches.
- Construction personnel will receive a Toolbox Talk detailing the presence of sensitive ecological features at or close to the Sites and will be informed that no materials should be stored, or vehicles drive, through buffer zones.
- An Ecological Clerk of Works will be designated at the onset of the construction phase, which will provide ecological supervision during the completion of any works which have the potential to impact protected and notable species, as appropriate.

9.7.12 Access tracks will be routed with ecological sensitivity in mind, along existing farm tracks, and will be sited to avoid designated buffer zones wherever possible. Any unavoidable deviations from this (e.g. for access to critical hardware) will be clearly set out in the Environmental Statement.

9.7.13 Access for construction and operation will utilise existing field entrances and gaps in hedgerows and other linear habitats wherever possible. The final locations of any unavoidable new gaps in hedgerows will be provided in due course to accompany the Environmental Statement. Hedgerow losses associated with the construction phase only will be reinstated. Translocation of hedgerow sections will be explored as a further mitigation option where appropriate. New accesses are understood to measure approximately 3-6m.

9.7.14 Temporary site lighting during construction will be required to enable safe working during construction during hours of darkness (likely over the winter months only) and will be designed as far as reasonably practicable to minimise potential for light spillage outside the Sites and Cable

Corridor, particularly towards valuable ecological habitats. Standard good practice measures would be employed to minimise light spill, including glare, during construction. A sensitive lighting strategy will specify where and how any artificial lighting will be used, which will serve to mitigate adverse impacts on ecological receptors such as bats.

9.7.15 The final cable route will be sited to best avoid impacts on ecological features as identified during the desk study and ecological fieldwork. This will include observing appropriate buffers from sensitive boundary features wherever possible.

9.7.16 Final details for the installation of the cables are not yet determined, but general principles are understood to comprise the creation of a narrow trench (typically 1-7m wide) with an excavator, into which a duct or ducts are placed before the trench is backfilled. The cables will be pulled through the ducts between intermittent access hatches. Intermittent site compounds are understood to be necessary, and the working width is anticipated to be 50m wide, but may be wider in some cases, as necessary.

9.7.17 As already outlined, the final route the cable will take will depend on the outcome of the planned further ecological surveys. The route design process will continue to seek to avoid all ecologically valuable features as far as possible and mitigate for any impacts arising. It is anticipated that a Precautionary Method of Working will be employed, to include the supervision of an Ecological Clerk of Works where necessary, sensitive ecological timing of works, HDD beneath particularly sensitive features and other mitigation measures outlined in this section. The ecological avoidance, mitigation and compensation measures determined to be necessary for cable route installation will be detailed within a CEMP.

**Embedded Operational Phase Mitigation Measures**

9.7.18 Undeveloped buffer zones will safeguard important receptors for the lifetime of the Scheme. Such buffer zones will also provide sufficient and appropriate working areas to maintain habitats within the Scheme, such as hedgerows, without conflict between the routine operation of the Scheme.

9.7.19 The perimeter of the Solar Arrays will be fenced for security purposes. It is not established at this stage to what extent internal array field boundaries will be fenced. This will determine the separation or continuity of habitat management within buffer zones or under arrays.

9.7.20 Operation of the Solar Arrays require minimal intervention and as such levels of disturbance (light, noise and human presence) upon wildlife within the Sites will be minimal, and likely lower or no more than at baseline, during the operational phase.

9.7.21 As noted in **Chapter 4: Scheme Description**, lighting is not required within the Solar Arrays for the operational phase. Motion sensing security lighting will be provided within substations and within the BESS Site to be used only for maintenance and security purposes. A sensitive lighting strategy will specify how this artificial lighting will be installed and used, which will serve to mitigate adverse impacts on ecological receptors which are adversely impacted by lighting, such as bats.

9.7.22 Landscape planting will be provided as part of the proposals, the maintenance of which will be specified in a LEMP.

9.7.23 Habitats under operational arrays will be either managed through grazing or cutting. The proportion of grazing and cutting will be balanced to maximise the ecological benefits which can arise from a sensitively-timed cutting regime. Grazing methods such as pulse-grazing, aftermath grazing, and conservation grazing can also be employed. Appropriate potential management options will be contained within the LEMP which will be secured under a DCO Requirement upon consent.

9.7.24 Enhancement opportunities will be sought which target particular receptors with local, regional or national significance. Such receptors will be identified through the desk study and surveys, as follows:

- Species and Habitats of Principal Importance;
- Species of Conservation Concern;

- Local Biodiversity Action Plan Species and Habitats;
- Species known to be present in the local area through local records or survey data; and
- Habitats with potential for creation, restoration or enhancement in strategic locations, as identified in Habitat Opportunity Maps.

9.7.25 A range of enhancements will be considered and implemented as part of the Scheme to provide positive gains for a range of receptors. This will be further refined and developed through discussion with relevant consultees. All such enhancements will be detailed within the Environmental Statement submitted with the DCO application.

9.7.26 Where land has been excluded from development within the Sites, these areas will be examined during the design phase of the Scheme for their potential to be managed for ecological mitigation and enhancement, in order to provide Biodiversity Net Gain and contribute to policy-led green infrastructure and Nature Recovery Network principles.

9.7.27 It is anticipated that the Scheme will deliver substantial new hedgerow and tree planting, reinforcement planting at existing hedgerows and field boundaries, extensive grassland habitat creation and sympathetic management both within buffers and under the arrays, as well as discrete, valuable habitat creation away from the panels. While these measures have not yet been finalised, they are discussed according to their current design in relation to proposed ecological mitigation, Biodiversity Net Gain and enhancements in later sections within this document. Final details will be provided within the Environmental Statement submitted with the DCO application.

**Embedded Decommissioning Phase Mitigation Measures**

9.7.28 During the decommissioning phase, the protective buffer zones established during construction and maintained during operation will be honoured to avoid adverse impacts on valuable habitats outside of the operational array.

9.7.29 It is considered likely that the impacts and associated mitigation measures required during the decommissioning phase will be similar to those identified for the construction phase, however further mitigation measures may be required, depending on the future baseline of the Scheme. As a result, pre-decommissioning surveys and assessments will be required to identify whether the embedded mitigation of the Scheme is fully appropriate for the future baseline of the Scheme at the time of the decommissioning phase, and to conform with all applicable biodiversity policies and legislation. This will be set out within, and implemented through, the approved DEMP.

## 9.8 Preliminary Assessment of Effects

9.8.1 This section identifies and characterises potential impacts arising during the construction and operational phases on each Important Ecological Feature, according to the baseline data which are currently available at the time of writing, as well as the current stage of Scheme's design. When characterising impacts, embedded mitigation measures which form part of the Scheme's design and avoid or mitigate for potential impacts are taken into account and any significance of effect is described. Any additional mitigation required to reduce these potential impacts is then set out, together with a preliminary assessment of the significance of any residual effects after all mitigation measures have been factored in. Ecological enhancements which will be explored are also outlined and an indication of their impact on residual effects is given.

**Designated Sites**

**Upper Nene Valley Gravel Pits SPA, SSSI and Ramsar**

*Construction Phase Impacts*

9.8.2 This designated site is outside of the Scheme's boundary, but is adjacent to Green Hill BESS, and the majority of the Sites (all Sites excluding Green Hill A and A.2) lie within 10km of the SPA.

9.8.3 The proximity to Green Hill BESS potentially makes the site susceptible to short to medium-term degradation impacts during the construction phase, arising from discharge/deposition of sediments, dust and contaminants. Ecological buffers have been embedded into the design of

the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the construction phase. This includes the omission of the field which lies closest to the SPA from the development area. Additionally, embedded mitigation measures to minimise the likelihood and severity of pollution events, dust deposition and run-off arising during the construction and operational phases, have been incorporated into the Scheme. An Outline CEMP will be submitted with the Environmental Statement, which will detail how vehicles, plant and materials will be transported to the construction zone, as well as other standard environmental protection measures that will apply to the construction phase, such as dust suppression, pollution control measures and protection of adjacent habitats/watercourses from surface runoff. Given the above embedded mitigation measures, it is considered that significant impacts arising from discharge/deposition of sediments, dust and contaminants can be avoided/mitigated, and therefore **no significant adverse effects** on the above designated sites through this potential impact pathway are anticipated.

9.8.4 The construction of the Scheme will not result in any direct impacts on habitats within the SPA, however land within 10km of the SPA may be functionally linked and provide supporting habitat for overwintering bird species for which the SPA is designated, such as golden plover and lapwing. These species tend to disperse widely from the SPA for foraging, and thus are most at risk of impacts from loss of surrounding land. To date, low numbers of both golden plover and lapwing have been recorded within the Sites on a small number of occasions during wintering bird surveys. However, numbers recorded within any single survey visit to date have not met the threshold levels to classify land within the Sites as functionally-linked (1% of the population, as per SPA citation).

9.8.5 Several other species which are part of the assemblage for which the SPA has been designated have also been recorded by surveys to date; chiefly flying over the Sites and, less frequently, foraging or sheltering within the Sites. Relevant species include grey heron *Ardea cinerea*, wigeon *Anas penelope*, shoveler *Anas clypeata* and cormorant *Phalacrocorax carbo*. Given the limited use of the Sites by these species, it is currently considered highly unlikely that such species are dependent to any significant extent upon land within the Scheme.

9.8.6 Extensive wintering bird survey work is currently ongoing to establish whether there is any functional linkage between the Sites and the SPA, and therefore it is considered that **insufficient information** is currently available to fully evaluate the scope and significance of any potential impacts on the above designated sites. However, functional linkage is not indicated within current data. An assessment of effects relating to Upper Nene Valley Gravel Pits SPA, SSSI and Ramsar is therefore deferred until full survey information has been collected and analysed. A full assessment of effects will be detailed within the ES Chapter.

*Operational Impacts*

9.8.7 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially degrade the water quality of the SPA. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the Hydrology and Drainage chapter, and the Ground Conditions and Contamination chapter.

9.8.8 Permanent loss of any functionally linked land could reduce the available foraging habitat for plover associated with the SPA. Extensive wintering bird survey work is currently ongoing to establish whether there is any functional linkage between the Sites and the SPA, and therefore it is considered that **insufficient information** is currently available to fully evaluate the scope and significance of any potential impacts on the above designated sites. However, functional linkage is not indicated within current data. An assessment of effects relating to Upper Nene Valley Gravel Pits SPA, SSSI and Ramsar is therefore deferred until full survey information has been collected and analysed. A full assessment of effects will be detailed within the ES Chapter.

**National Statutory Designated Sites within 300m of Scheme**

9.8.9 The National Statutory Designated Sites considered in this preliminary assessment are as follows:

- Badsaddle, Withmale Park and Bush Walk Woods SSSI
- Bozeat Meadow SSSI
- Hardwick Lodge Meadow SSSI

9.8.10 The above designated Sites are all located within 300m of the current Scheme boundary (including the current Cable Route Search Area), although it should be noted that the finalisation of the Preferred Cable Corridor will reduce the size of the Scheme boundary significantly (and therefore some of these designated sites may not be within 300m of the finalised Scheme boundary). Nevertheless, for the purposes of this preliminary assessment, it is assumed that all of these sites do lie within 300m of the Scheme boundary.

*Construction Phase Impacts*

9.8.11 Given that the above designated sites lie outside of the Scheme boundary, no direct impacts on habitats present within the above sites are anticipated during the construction phase.

9.8.12 The proximity of the above designated sites to the Scheme (within a maximum of 300m) potentially makes them susceptible to short to medium-term degradation impacts during the construction phase, arising from discharge/deposition of sediments, dust and contaminants.

9.8.13 Ecological buffers have been incorporated into the design of the Scheme from an early stage. Given that Badsaddle, Withmale Park and Bush Walk Woods SSSI lies approximately 210m from the current Cable Route Search Area at its closest point and 310m from Green Hill A.2 at its closest point, no specific additional buffers are considered to be required for this designated site. However, Bozeat Meadow SSSI and Hardwick Lodge Meadow SSSI both lie immediately adjacent to the current Cable Route Search Area. Upon finalisation of the Cable Corridor, any potential impact pathways between the Scheme and these designated sites will be re-assessed, and any additional buffers from construction work deemed to be required will be implemented into the design of the Scheme, in order to minimise the likelihood of adverse impacts arising during the construction phase.

9.8.14 Embedded mitigation measures to minimise the likelihood and severity of pollution events, dust deposition and run-off arising during the construction and operational phases, have been incorporated into the Scheme. An Outline CEMP will be submitted with the Environmental Statement, which will detail how vehicles, plant and materials will be transported to the construction zone, as well as other standard environmental protection measures that will apply to the construction phase, such as dust suppression, pollution control measures and protection of adjacent habitats/watercourses from surface runoff. Given the above embedded mitigation measures, it is considered that significant impacts arising from discharge/deposition of sediments, dust and contaminants can be avoided/mitigated, and therefore **no significant adverse effects** on the above designated sites through this potential impact pathway are anticipated.

9.8.15 Although the location and extent of new site accesses and haul routes have not been confirmed, the above designated sites may also be susceptible to habitat fragmentation impacts through the creation of new accesses in hedgerows within the Scheme's boundary, which contribute to habitat connectivity between these designated sites and the local landscape. The design of the Scheme will consider the locations of existing accesses and utilise these wherever possible to avoid construction phase impacts. Habitat connectivity will also be assessed at the landscape level (for example, through analysis of static bat activity survey data) to ensure that any new accesses are located in areas which would not significantly degrade hedgerows that provide key habitat connectivity within the local landscape (for example, hedgerows that connect local parcels of woodland). Where it is not possible to utilise existing accesses and new accesses are proposed, the smallest practical access gap permissible will be used. These are anticipated to measure no more than a typical agricultural access at 3-6m. The final access locations will be determined through careful design, and if they are deemed necessary, will be sited in locations of lower-quality habitat wherever possible. Where this is not practicable, consultation with local Wildlife

Trusts and other stakeholders would be carried out to discuss compensatory habitat management measures in order to restore and improve the ecological value of the designated sites elsewhere, as may be appropriate. The outcome of this will be incorporated into the Environmental Statement submitted with the DCO application.

9.8.16 Given that embedded mitigation measures will minimise any potential impacts on the above designated sites during the construction phase, it is currently considered that all reasonable steps will be taken to ensure that **no significant adverse effects** will occur on these sites during the construction phase. However, this preliminary assessment will need to be revisited following the completion of the Scheme design, as the extent of habitat fragmentation caused by the creation of new site accesses is not currently finalised and will need to be considered in this assessment.

*Operational Phase Impacts*

9.8.17 Operationally, impacts on these designated sites are likely to be negligible. Access onto the Sites for maintenance of hardware and habitats will be required at regular intervals, but by typically small numbers of vehicles and personnel. The only time when this will be increased is during replacement of panels and batteries, understood to be approximately every 40 years and 20 years respectively. Since the primary infrastructure (panel frames and BESS compound) would already have been built, there is a reduced risk of habitat degradation and associated dust deposition or soil runoff through equipment replacement during the operational phase. Likewise, the risk of accidental discharge of pollutants on the adjacent and nearby designated sites, resulting from the movement and refuelling of vehicles and plant, would be very low. Therefore, **no significant adverse effects** upon these sites are anticipated during the operational phase. No additional mitigation measures (beyond those embedded in the design of the Scheme) are required, and **no residual effects** are anticipated.

*Enhancement Measures*

9.8.18 Habitat Opportunity mapping provided by NBRC will be considered during the design of habitat creation and enhancement within the soft landscaping plans, with the intention of targeting habitat creation and enhancement in strategic locations to improve habitat connectivity at the local landscape level. Although the design of soft landscaping within the Scheme is currently at an early stage, strategic habitat creation associated with a Scheme of this scale has the potential provide ecological 'stepping stones' for various species within the local, largely arable landscape and significantly contribute to and strengthen the connectivity of the above designated sites. This may be achieved through the gapping up/enhancement of existing hedgerows in the vicinity of the above designated sites, as well as tree planting and the creation of areas of species-rich grassland within and outside of the solar array areas. Where possible, consultation with local Wildlife Trusts and other stakeholders may be carried out to discuss the most suitable locations for habitat creation and enhancement, and these will be considered during the design of the Scheme.

**National Statutory Designated Sites within 5km of Scheme**

9.8.19 The National Statutory Designated Sites considered in this preliminary assessment are as follows:

- Birch Spinney and Mawsley Marsh SSSI;
- Dungee Corner Meadow SSSI;
- Odell Great Wood SSSI;
- Pitsford Reservoir SSSI;
- Wollaston Meadows SSSI; and
- Yardley Chase SSSI.

*Construction Phase Impacts*

9.8.20 The above designated sites are all located outside of the Scheme's boundary (including the Cable Route Search Area) and are at least 300m (and up to 5km) from any part of the Scheme. As a result, no direct impacts to habitats within these designated sites during the construction phase

are anticipated. In addition, no indirect impacts during the construction phase, such as localised habitat fragmentation, noise, or habitat degradation arising from dust and silt deposition are anticipated.

9.8.21 In the absence of mitigation, there is potential for chemical spills and surface runoff into watercourses during the construction phase, which may subsequently degrade the habitats present within these sites, should they be hydrologically connected to the watercourses present within and adjacent to the Scheme. However, embedded mitigation measures will be incorporated into the CEMP to manage run-off and chemical spillages during the construction phase, as well as other general environmental protection measures aimed at minimising the risk of impacts to local watercourses and, by extension, hydrologically linked designated sites. Please refer to **Chapter 10: Hydrology, Flood Risk and Drainage** and **Chapter 22: Ground Conditions and Contamination**, for a full description of the above embedded mitigation measures.

9.8.22 Given the lack of impact pathways between the Scheme and the above designated sites following the implementation of the above embedded mitigation measures, no additional construction phase mitigation measures are required, and **no residual effects** are anticipated.

*Operational Phase Impacts*

9.8.23 Operationally, impacts on these designated sites are likely to be negligible, owing to the nature of the Scheme and the distance between these designated sites and the Scheme (at least 300m). No further construction activity or other intrusive, extractive or potentially damaging/polluting activity is required (other than replacement of panels and batteries every 40 or 20 years). In the case of replacement of panels and batteries, the risk of degradation of the sites resulting from pollution of connecting watercourses is low, and pollution control measures will be detailed in the OEMP. As such, no operational phase impacts on these designated sites are anticipated. Given the lack of impact pathways between the Scheme and the above designated sites, no additional operational phase mitigation measures are required, and **no residual effects** are anticipated.

**Local Statutory and Non-Statutory Designated Sites within Scheme/Cable Route Search Area**

9.8.24 The Local Statutory and Non-Statutory Designated Sites considered in this preliminary assessment are as follows:

- Earls Barton Meadow LWS
- Ecton Gravel Pits LWS
- Grendon Lakes LWS
- Grendon Lakes North LWS
- Grendon Quarter Pond LWS
- Wilby Meadows Stream LWS

9.8.25 None of the above designated sites lie within the boundaries of the Sites, except Grendon Lakes LWS, which encompasses a single field within the boundary of Green Hill BESS. All other designated sites occur within the current Cable Route Search Area. All are separated from each other in terms of location and functional linkage. These sites are generally designated for their wetland habitats, including lakes, gravel pits, wet grassland/floodplain meadow and mire.

9.8.26 It should be noted that the finalisation of the Preferred Cable Corridor will reduce the size of the Scheme boundary significantly (and therefore some/all of these designated sites may no longer lie within the finalised Scheme boundary). Nevertheless, for the purposes of this preliminary assessment, it is assumed that all of these sites do lie within the Scheme boundary.

*Construction Phase Impacts*

9.8.27 The proximity of Grendon Lakes LWS to Green Hill BESS potentially makes this site susceptible to short to medium-term degradation impacts during the construction phase, arising from discharge/deposition of sediments, dust and contaminants. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the construction phase. This includes the omission of the field which contains part of the LWS from the development area. Additionally, embedded mitigation measures to minimise the likelihood and severity of pollution events, dust deposition and run-off arising during the construction and operational phases, have been incorporated into the Scheme.

An Outline CEMP will be submitted with the Environmental Statement, which will detail how vehicles, plant and materials will be transported to the construction zone, as well as other standard environmental protection measures that will apply to the construction phase, such as dust suppression, pollution control measures and protection of adjacent habitats/watercourses from surface runoff. Given the above embedded mitigation measures, it is considered that significant impacts arising from discharge/deposition of sediments, dust and contaminants can be avoided/mitigated, and therefore **no significant adverse effects** on Grendon Lakes LWS through this potential impact pathway are anticipated.

9.8.28 In the absence of embedded avoidance/mitigation measures, potential direct impacts upon the remaining designated sites could arise should any part of the sites be damaged/removed to facilitate the installation of cables or other solar infrastructure. The process of finalising the Cable Corridor will aim to avoid any direct impacts upon all the designated sites as far as possible. All alternatives to passing through or causing impacts upon these sites will be explored.

9.8.29 Indirectly, fragmentation from local habitat loss, or degradation through a reduction in habitat quality from pollution or other means may also follow. Embedded mitigation measures to minimise the likelihood and impacts of pollution events (including potential battery fire), dust deposition and run-off arising during the construction and operational phases will be incorporated into the Scheme. An Outline CEMP will be submitted with the Environmental Statement, which will detail how vehicles, plant and materials will be transported to the construction zone, as well as other standard environmental protection measures that will apply to the construction phase, such as dust suppression, pollution control measures and protection of adjacent habitats/watercourses from surface runoff.

9.8.30 Given that the Cable Corridor has not currently been finalized, it is considered that **insufficient information** is currently available to fully evaluate the scope and significance of any potential construction phase impacts on the above designated sites. A full impact assessment on these sites will be included in the ES.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.31 In the event that the cable route cannot avoid a designated site, the most likely method of cable installation to be adopted would be that of HDD, entailing the trench-less installation of cables using an automated drilling machine. Measures would be put in place to minimise sediment release or disturbance through appropriate siting of entry and exit pits and depth settings.

9.8.32 In the event that direct impacts are unavoidable, detailed survey and consultation with bodies such as Wildlife Trust for Beds, Cambs and Northants would be carried out to determine the best way to remediate and reinstate habitats which would be affected, tailored to the site in question. An agreed method of working, likely to involve Ecological Clerk of Works Supervision, sensitive seasonal timing and phased habitat clearance would form part of the Outline CEMP submitted with the Environmental Statement.

9.8.33 It is fully intended that all reasonable steps will be taken to ensure that **no residual effects** will occur on these sites as a result of the cable installation works, however this preliminary assessment will need to be revisited upon confirmation of the siting of the Cable Corridor.

*Operational Phase Impacts*

9.8.34 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially degrade the water quality of the Grendon Lakes LWS. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the Hydrology and Drainage chapter, and the Ground Conditions and Contamination chapter.

9.8.35 Replacement of panels and batteries is understood to be approximately every 40 years and 20 years respectively. Since the primary infrastructure (panel frames and BESS compound) would already have been built, there is a reduced risk of habitat degradation and associated dust deposition or soil runoff through equipment replacement during the operational phase. Likewise, the risk of accidental discharge of pollutants on the Grendon Lakes LWS, resulting from the movement and refuelling of vehicles and plant, would be very low. Therefore, **no significant adverse effects** upon Grendon Lakes LWS are anticipated during the operational phase. No additional mitigation measures (beyond those embedded in the design of the Scheme) are required, and **no residual effects** are anticipated.

9.8.36 Once the cable route is installed, it is understood that the cables will remain undisturbed for the life of the Scheme. Therefore, no significant impacts upon the other LWSs within the CRSA are anticipated during the operational phase. No additional mitigation measures are required, and **no residual effects** are anticipated.

*Ecological Enhancements*

9.8.37 Where the finalised cable route passes in proximity to any designated site, opportunities for the enhancement of the designated site, or of intervening connected Green Infrastructure as a result of the Scheme will be explored. Advice will be sought from the above-mentioned parties for practical and meaningful steps to improve local biodiversity and contribute to Local Nature Recovery Networks.

**Local Statutory and Non-Statutory Designated Sites within 300m of Scheme**

9.8.38 The Local Statutory and Non-Statutory Designated Sites considered in this preliminary assessment are as follows:

- Nun Wood CWS;
- Bozeat Cemetery LWS;
- Bozeat Verge LWS;
- Broughton Green Lane LWS;
- Cold Oak Copse LWS;
- Earl's Barton Carr LWS;
- Hardwick Wood LWS;
- Horn Wood LWS;
- Long Furlong and Old Pastures LWS;
- Menagerie Pond LWS;
- Par Pond LWS;
- Scotland Pond LWS;
- Sywell Reservoir and Country Park LWS;
- Threeshires Wood LWS;
- Walgrave East Meadow LWS; and
- Yardley Brook Field LWS.

9.8.39 The above designated Sites are all located within 300m of the current Scheme boundary (including the current Cable Route Search Area), although it should be noted that the finalisation of the Preferred Cable Corridor will reduce the size of the Scheme boundary significantly (and therefore some of these designated sites may not be within 300m of the finalised Scheme boundary). Nevertheless, for the purposes of this preliminary assessment, it is assumed that all of these sites do lie within 300m of the Scheme boundary.

*Construction Phase Impacts*

9.8.40 No direct impacts on habitats present within the above designated sites are anticipated during the construction phase.

9.8.41 The proximity of the above designated sites to the Scheme (within a maximum of 300m) potentially makes them susceptible to short to medium-term degradation impacts during the construction phase, arising from discharge/deposition of sediments, dust and contaminants.

9.8.42 Embedded mitigation measures to minimise the likelihood and impacts of pollution events, dust deposition and run-off arising during the construction and operational phases have been incorporated into the Scheme and secured via the CEMP. Ecological buffers have been incorporated into the design of the Scheme from an early stage. These include buffers from any parcels of woodland, including those designated as County Wildlife Sites and Local Wildlife Sites. Given that Nun Wood CWS, Hardwick Wood LWS, Horn Wood LWS and Threeshire's Wood LWS are all located immediately adjacent to the Scheme boundary and are designated for their ancient woodland habitats, these will all be buffered by a minimum of 30m from development in order to minimise the likelihood of adverse impacts during the construction phase of the Scheme.

9.8.43 An Outline CEMP will be submitted with the Environmental Statement, which will detail how vehicles, plant and materials will be transported to the construction zone, as well as other standard environmental protection measures that will apply to the construction phase, such as dust suppression, pollution control measures and protection of adjacent habitats/watercourses from surface runoff. Given the above embedded mitigation measures, it is considered that significant impacts arising from discharge/deposition of sediments, dust and contaminants can be avoided/mitigated, and therefore **no significant adverse effects** on the above designated sites through this potential impact pathway are anticipated.

9.8.44 Although the location and extent of new site accesses and haul routes have not been confirmed, the above designated sites may also be susceptible to habitat fragmentation impacts through the creation of new accesses in hedgerows within the Scheme boundary, which contribute to habitat connectivity between these designated sites and the local landscape.

9.8.45 The design of the Scheme will consider the locations of existing accesses and utilise these wherever possible to avoid construction phase impacts. Habitat connectivity will also be assessed at the landscape level (for example, through analysis of static bat activity survey data) to ensure that any new accesses are located in areas which would not significantly degrade hedgerows that provide key habitat connectivity within the local landscape (for example, hedgerows that connect local parcels of woodland).

9.8.46 Where it is not possible to utilise existing access and new accesses are proposed, the smallest practical access gap permissible will be used. These are anticipated to measure no more than a typical agricultural access at 3-6m. The final access locations will be determined through careful design, and if they are deemed necessary, will be sited in locations of lower-quality habitat wherever possible. Where this is not practicable, consultation with local Wildlife Trusts and other stakeholders may be carried out to discuss compensatory habitat management measures in order to restore and improve the ecological value of the designated sites elsewhere, as may be appropriate. The outcome of this will be incorporated into the Environmental Statement submitted with the DCO application.

9.8.47 Given that embedded mitigation measures will aim to minimise any potential impacts on the above designated sites during the construction phase, it is currently considered that all reasonable steps will be taken to ensure that **no significant adverse effects** will occur on these sites during the construction phase. However, this preliminary assessment will need to be revisited following the completion of the Scheme design, as the extent of habitat fragmentation caused by the creation of new site accesses is not currently finalised and will need to be considered in this assessment.

*Operational Phase Impacts*

9.8.48 Operationally, impacts on these designated sites are likely to be negligible, owing to the nature of the Scheme whereby no further construction activity or other intrusive, extractive or potentially damaging/polluting activity is required. The only exception to this is during replacement of panels

and batteries, understood to be approximately every 40 years and 20 years respectively. Since the primary infrastructure (panel frames and BESS compound) would already have been built, there is a reduced risk of habitat degradation and associated dust deposition or soil runoff through equipment replacement during the operational phase. Likewise, the risk of accidental discharge of pollutants on the designated sites, resulting from the movement and refuelling of vehicles and plant, would be very low, and pollution control measures will be detailed in the OEMP.

9.8.49 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially impact nearby designated sites which are hydrologically connected. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the Hydrology and Drainage chapter, and the Ground Conditions and Contamination chapter.

9.8.50 **No significant adverse effects** upon these sites are anticipated during the operational phase. No additional mitigation measures (beyond those embedded in the design of the Scheme) are required, and **no residual effects** are anticipated.

*Enhancement Measures*

9.8.51 Habitat Opportunity mapping provided by NBRC will be considered during the design of habitat creation and enhancement within the soft landscaping plans, with the intention of targeting habitat creation and enhancement in strategic locations to improve habitat connectivity at the local landscape level. Although the design of soft landscaping within the Scheme is currently at an early stage, landscaping associated with a Scheme of this scale may significantly contribute to and strengthen the connectivity between the above designated sites and the local landscape. This may be achieved through the gapping up/enhancement of existing hedgerows in the vicinity of the above designated sites, as well as tree planting and the creation of areas of species-rich grassland within and outside of the solar array areas, which may provide ecological 'stepping stones' for various species within the local, largely arable landscape.

**Local Statutory and Non-Statutory Designated Sites within 2km of Scheme**

9.8.52 The Local Statutory and Non-Statutory Designated Sites considered in this preliminary assessment are as follows:

- Crowfields Common LNR;
- Glamis Meadow and Wood LNR;
- Harrold Odell Country Park LNR;
- Lings Wood LNR;
- Scrub Field LNR;
- Summer Leys LNR, LWS;
- Templegrove Spinney CWS;
- The Slipe CWS;
- Bozeat Glebe Meadow LWS;
- Bozeat Wood LWS;
- Castle Ashby Parkland LWS;
- Castle Ashby Woodland LWS;
- Cowpasture Spinney LWS;

- Earls Barton Lock Lake LWS;
- Engine Pond LWS;
- Hardwater Meadows LWS;
- Hardwick Road Verge LWS;
- Highcroft Farm Meadow LWS;
- Hog Hole Spinney LWS;
- Lavendon Wood LWS;
- Old Poors Gorse LWS;
- Park Farm Industrial Estate LWS;
- The Basin LWS;
- Vivians Covert LWS;
- Warren Ponds LWS;
- Wilby Way Meadows LWS; and
- Pitsford Water WTR.

*Construction Phase Impacts*

9.8.53 The above designated sites are all located outside of the Scheme's boundary (including the Cable Route Search Area) and are at least 300m (and up to 2km) from any part of the Scheme. As a result, no direct impacts to habitats within these designated sites during the construction phase are anticipated. In addition, no indirect impacts during the construction phase, such as localised habitat fragmentation, noise, or habitat degradation arising from dust and silt deposition are anticipated.

9.8.54 There is potential for chemical spills and surface runoff into watercourses during the construction phase, which may subsequently degrade the habitats present within these sites, should they be hydrologically connected to the watercourses present within and adjacent to the Scheme. However, embedded mitigation measures will be incorporated into the CEMP to manage run-off and chemical spillages during the construction phase, as well as other general environmental protection measures aimed at minimising the risk of impacts to local watercourses and, by extension, hydrologically linked designated sites. Please refer to **Chapter 10: Hydrology, Flood Risk and Drainage** for a full description of the above embedded mitigation measures.

9.8.55 Given the lack of impact pathways between the Scheme and the above designated sites, no additional construction phase mitigation measures are required, and **no residual effects** are anticipated.

*Operational Phase Impacts*

9.8.56 Operationally, impacts on these designated sites are likely to be negligible, given the distance between these designated sites and the Scheme (at least 300m), as well as the low levels of activity associated with the operational phase of a solar farm. Even in the case of the replacement of panels and batteries, this would not be expected to give rise to any impacts due to the distance between the Sites and the above designated sites. As such, no operational phase impacts on these designated sites are anticipated. Given the lack of impact pathways between the Scheme and the above designated sites, no additional operational phase mitigation measures are required, and **no residual effects** are anticipated.

### Habitats

#### Arable Field Margins and Other Neutral Grassland

*Construction Phase Impacts*

9.8.57 Without careful scheme design, the most diverse fragments and patches of Other Neutral Grassland within the Scheme's boundary would either be lost or would succeed to scrub over time. Given that the design of the Scheme is still being finalised, the full extent of habitat loss, retention and creation is not confirmed at the time of writing, however the retention of the most valuable areas of Other Neutral Grassland has been embedded into the design of the Scheme from an early stage.

9.8.58 The implementation of extensive buffer zones which almost universally measure wider than current arable field margins will result in a significant net gain in the coverage of marginal grassland habitats. Ecological buffers being applied to the design of the Scheme are listed in paragraph 9.7.9. Although arable field margins will not be buffered specifically, these habitats will likely fall within the buffer zones of other habitats (such as 15m buffers from hedgerows) and will themselves be retained and protected during the construction phase wherever feasible.

9.8.59 The completion of a full Biodiversity Net Gain Assessment (taking account of habitat trading rules and ensuring that a 10% net gain for biodiversity is achieved) will ensure that any losses in grassland habitats are fully compensated for through the creation of new areas of grassland, as well as the enhancement of areas of retained grassland over the lifetime of the Scheme.

9.8.60 Although some areas of existing grassland may be lost during the construction phase, the Scheme will be designed to ensure that the most valuable habitats are retained and protected during the construction phase, and therefore any losses are considered likely to be minor. These would be more than adequately compensated for through the retention of wider undeveloped buffer zones, the reversion of arable to a mosaic of grassland management and the implementation of an ecologically beneficial management scheme.

9.8.61 A full assessment will be prepared and submitted with the Environmental Statement, when the design of the Scheme has been finalised. However, given that the Scheme will be designed to ensure that no net loss of grassland habitats occurs across the entirety of the Scheme (in accordance with the Statutory Biodiversity Net Gain Metric), it is anticipated that the Scheme will result in **no significant adverse effects** on the extent or quality of grassland habitats over the lifetime of the Scheme.

*Operational Phase Impacts*

9.8.62 Operationally, access onto the Sites for maintenance of hardware and habitats will be required at regular intervals, but by typically small numbers of vehicles and personnel. The only time when this will be increased is during replacement of panels and batteries, understood to be approximately every 40 years and 20 years respectively. Embedded mitigation measures will ensure that the degradation of grassland habitats over the operational phase is avoided, including sensitive timing of works, correct use of tyres for vehicles and careful storage of materials. This will be detailed in the eventual LEMP. Given these embedded measures, no additional operational phase mitigation measures in relation to grassland habitats are required.

9.8.63 While arable field margins and other grassland habitats within the retained buffer zones would benefit from cessation of agricultural inputs and sprays, they would be at risk of long-term degradation through eventual succession to scrub without periodic management. Embedded mitigation measures include a detailed Landscape Environmental Management Plan which will be submitted alongside the Environmental Statement, which will specify how retained and newly created arable field margins will be managed for the lifetime of the Scheme.

9.8.64 The extent of grassland present within the Scheme boundary will significantly increase, following the reversion of arable land within panelled areas to grassland habitats. The LEMP implemented during the operational phase will aim to maximise the value of these grasslands for biodiversity through favourable cutting/grazing regimes, and therefore the Scheme is anticipated to support habitats of higher biodiversity value during the operational phase than at baseline. Taking into

account the measures to be set out in the LEMP, **no significant adverse effects** on grassland extent or quality are anticipated.

*Enhancement Measures*

9.8.65 The reversion of the arable fields which dominate the Sites to permanent grassland (for the lifetime of the Scheme) is considered likely to result in a **significant beneficial effect** in the extent and quality of grassland habitats within the Scheme boundary, which would likely be significant at a **District** level.

9.8.66 Prescriptions for the creation and management of all grassland within the Scheme (under panels and in buffer/ecological mitigation zones) would be set out within the eventual finalised LEMP. The general objective would be to generate a simple mosaic of grassland habitats through the adoption of a number of different habitat management types revolving around the timing and frequency of cutting. Grassland management objectives may range from conservation-grazed pasture, to tussocky grassland, flowering meadow and ruderal-mix grassland. Further detail and refinement of the LEMP would be undertaken in consultation with key stakeholders including conservation organisations, site management companies and consultees, so as to ensure both the optimum biodiversity value and practicability/delivery of the prescriptions.

**Woodland**

*Construction Phase Impacts*

9.8.67 No direct loss of woodland is anticipated, as all access, hardware and cabling installation will avoid the woodland habitats which occur within and adjacent to the Sites.

9.8.68 Protective, development-free buffers of 30m from parcels of ancient woodland and 20m from all other woodland have been designed into the scheme and will be demarcated by protective fencing prior to commencement of construction as part of the CEMP, so that accidental physical damage (such as direct contact with vehicles or root compaction) can be avoided. The buffer distances would be observed thereafter for the lifetime of the scheme.

9.8.69 Woodland in close proximity to the array sites, haul routes and cable installation works, would remain sensitive to degradation through accidental pollution events and dust deposition. Construction activities could also lead to a small amount of noise and possibly light disturbance to species within adjacent woodland. However, this effect would be temporary and would likely only affect the margins of the woodland.

9.8.70 It should be noted that a certain amount of noise disturbance, dust deposition and run off would also be expected as a result of routine agricultural activities, and as such these impacts are likely to be similar to the current baseline conditions.

9.8.71 Measures within the CEMP, covering the protection of woodland at boundaries, working in extremely dry or wet weather, storage and use of fuels and chemicals, and the movement of vehicles and plant, will be secured as part of the DCO, and will reduce the likelihood of these impacts occurring.

9.8.72 When considering the embedded mitigation measures implemented in the CEMP, it is considered unlikely that any significant impacts to woodland habitats would arise during the construction phase. No additional mitigation measures are therefore considered necessary, and **no residual effects** are anticipated.

*Operational Phase Impacts*

9.8.73 The Scheme has been designed to account for shading effects of woodland when considering the placement of panels. As such, there should be no conflict between the efficiency of energy generation and shading from woodland during operation.

9.8.74 Due to the largely passive nature of the operational Scheme, impacts on woodland during operation are not anticipated. A LEMP will be implemented to delineate each retained and protected habitat and set out the different management practices to be carried out within them. Woodland management is not anticipated to be necessary, although periodic pruning or trimming

back of self-seeded boundary vegetation may be required in order to keep the arrays and maintenance tracks clear of tall, woody vegetation.

9.8.75 Operationally, access onto the Sites for maintenance of hardware and habitats will be required at regular intervals, but by typically small numbers of vehicles and personnel. The only time when this will be increased is during replacement of panels and batteries, understood to be approximately every 40 years and 20 years respectively. However, movement of vehicles close to the woodland edges is not anticipated; this will be imposed by sufficient protected buffer zones and the restriction of vehicles to demarcated tracks wherever possible. Given that embedded mitigation measures will be incorporated into the Scheme to avoid any significant impacts on woodland during the operational phase, no additional mitigation measures are considered necessary, and no **residual adverse effects** are anticipated.

9.8.76 Woodland habitats are likely currently subject to spray drift from the use of pesticides and herbicides as part of intensive arable farming practices. The cessation of these processes is likely to be of benefit to the woodland habitat edges during the life span of the Scheme, encouraging the proliferation of woodland ground flora. This would likely constitute a **significant long-term beneficial effect** at the **Local** level, across all areas of woodland where intensive farming practices are currently used.

*Enhancement Measures*

9.8.77 Although the landscaping plans for the Scheme are not yet finalised, it is anticipated that a level of woodland/tree planting for screening purposes may be incorporated. Depending upon the level of screening planting implemented, this may result in a beneficial effect on the extent of woodland within the local landscape, which would contribute to the joining up of woodland stands and proliferation of Green Infrastructure. Locations for planting will be directed by the need for landscaping and visual impact mitigation, but will also be influenced by the objectives within the Biodiversity Opportunities Mapping for Northamptonshire and where gains from connecting habitat parcels are clearest. The significance of this potential effect will be assessed in the ES Chapter.

**Rural Trees, and Ancient/Veteran Trees**

9.8.78 Please refer to **Chapter 19: Arboriculture** for full assessment details on trees (including ancient and veteran trees).

9.8.79 Details of potential impacts on roosting bats and nesting birds in trees are provided in 'Bats' and 'Breeding Birds – Other Species' respectively below.

9.8.80 A full BNG assessment will be conducted and submitted with the ES, taking account of all habitat trading rules and the latest Statutory Metric requirements. As ancient and veteran trees are considered irreplaceable habitats, the retention of these trees has been designed into the Scheme, and these features will be protected throughout the lifetime of the Scheme through the implementation of protective fencing during the construction phase and the retention of buffers during the operational phase. It is also currently proposed that all individual in-field mature trees will be retained. Any losses of individual trees will be fully compensated for through the enhancement of existing habitats and the creation of new habitats (likely including tree planting).

**Ponds**

*Construction Phase Impacts*

9.8.81 No ponds are anticipated to be directly impacted through habitat loss or fragmentation as a result of the Scheme. Ponds are generally situated close to the field boundaries and can be sufficiently excluded and buffered from development, with the vast majority, if not all, intervening connected habitat retained. A 20m development free buffer from all ponds will also be observed.

9.8.82 There is a risk of degradation of the retained pond habitats through dust deposition, accidental pollution events and run off doing construction activities. This could damage the habitat within and surrounding the ponds as well as affecting the species which inhabit them. The adoption and

implementation of the CEMP and its measures to avoid and minimise the risk of impacts from damage, run-off and pollution will be crucial to avoiding impacts on ponds.

9.8.83 When considering the above embedded mitigation measures that will be adopted in the form of the CEMP, it is considered that any significant impacts to ponds during the construction phase could likely be avoided. As a result, no additional mitigation measures for ponds during the construction phase are required, and **no residual effects** are anticipated.

*Operational Phase Impacts*

9.8.84 There is a risk that ponds may become damaged should sheep be utilized for grazing during the operational phase, as a grassland management measure. Sheep may poach pond habitats causing damage to the marginal vegetation and increased suspended sediment content of the water. The LEMP will contain grassland, buffer and pond-edge habitat management measures with the aim of maximising the biodiversity value of the retained ponds, including minimising the risk of poaching by livestock.

9.8.85 The risk of ongoing pollution or damage from routine maintenance operations is minimal given the general restriction of vehicle movements to made-up tracks and the imposition of development free buffer zones between hardware and ditch habitats.

9.8.86 Given the embedded mitigation measures incorporated into the LEMP which will be submitted with the Environmental Statement, it is considered that any potential impact pathways to ponds arising during the operational phase can be avoided/fully mitigated. As a result, no additional mitigation measures are required, and **no significant adverse effects** are anticipated.

*Enhancement Measures*

9.8.87 It is currently anticipated that the Scheme will be registered under the District Licensing scheme for great crested newts, in order to mitigate potential impacts such as habitat loss and degradation during the construction phase. Offsite mitigation delivered through this scheme will comprise the creation of new ponds in strategic locations within the local landscape. When considering the ponds created under the District Licensing Scheme, as well as the fact that no existing ponds within the Scheme are proposed to be lost, the Scheme is anticipated to result in a **significant beneficial residual effect** in the extent of ponds in the local landscape, which would be significant at a **Local to District** level depending on the outcome of habitat management and monitoring and the adoption of ecological enhancements for the benefit of local pond network.

9.8.88 As with ditches and other watercourses, the cessation of agricultural practices is likely to lead to an improvement in the water quality within retained ponds.

9.8.89 Opportunities to create new areas of standing water, either in the form of swales for flood water attenuation or wildlife ponds will be explored during the next design stages of the Scheme. Ponds may be inappropriate in locations at high risk of drying out but would be located to extend or augment an existing pond network in hydrologically suitable locations.

**Hedgerows and Lines of Trees**

*Construction Phase Impacts*

9.8.90 The potential for loss of hedgerows and trees is very limited as existing hedgerow gaps will be utilised wherever possible to gain access for construction and operation. In the finalisation of designs, a small number of new gaps may need to be created, although in the context of the Site's hedgerow network, any loss will be proportionately very small (likely far less than 1%), and replacement planting will be part of the landscaping plans to ensure that any losses are compensated for.

9.8.91 Protective, development-free buffers of 15m from all hedgerows, and between 8-15m for trees (or larger if root protection zones dictate) have been designed into the scheme, to be installed during the construction phase and observed for the life of the scheme thereafter. This will help to avoid any accidental damage or degradation during the construction phase.

9.8.92 Measures covering the protection of woodland at boundaries, working in extremely dry or wet weather, storage and use of fuels and chemicals and the movement of vehicles and plant, will be incorporated into the CEMP and specifically tailored to avoid impacts upon hedgerows and trees.

9.8.93 Given that hedgerow losses during the construction phase are anticipated to be minimal and replacement planting will be implemented to ensure that any losses are fully compensated for, **no significant effects** in the extent or quality of hedgerows are anticipated during the construction phase.

*Operational Phase Impacts*

9.8.94 As with woodlands, the largely passive nature of the operational Scheme means impacts on hedgerows and trees are not anticipated, particularly when considering all ecological buffers which will be implemented and observed for the lifetime of the Scheme. As a result, **no significant adverse effects** on hedgerows and trees are anticipated during the operational phase, and no additional mitigation measures are required.

9.8.95 The cessation of intensive arable farming and use of pesticides and fertilisers is likely to be of benefit to the hedgerows and trees during the lifespan of the Scheme, encouraging the diversification of hedgerow ground flora. This would likely constitute a long-term **beneficial effect** at the **Local** level across all areas of hedgerow where intensive farming practices are currently used.

*Enhancement Measures*

9.8.96 Management measures will be contained within the LEMP which will have the aim of maximising the biodiversity value of retained and planted hedgerows in the long term. This will include rotational cutting of the hedgerows to ensure a diversity of habitats and the availability of foraging resources (such as berries) throughout the year, as well as the trimming back of self-seeded boundary vegetation, in order to keep the arrays and maintenance tracks clear of tall, woody vegetation. Additionally, the LEMP will specify maintenance of hedgerows at a minimum height of 2m, as this has been demonstrated to be important for promoting the biodiversity value of hedgerows. Overall, it is anticipated that the Scheme will result in a **significant beneficial effect** to the quality and extent of hedgerows and trees within the Sites, which is significant at a **Local** level.

9.8.97 Enhancement through the planting of new trees and hedgerows at boundaries is proposed and will focus on the gapping up of currently defunct hedgerows, creation of new hedgerows at boundaries where none exist; and planting around Public Rights of Way and where landscape and visual impact mitigation is required. In addition, there may be some limited opportunities for the replanting of old, removed field boundaries, where appropriate. Such new hedgerows will be native, locally-appropriate and species-rich. Details of any newly planted hedgerows, as well as the management of existing hedgerows, will be provided within the LEMP submitted with the ES.

**Ditches and Watercourses**

*Construction Phase Impacts*

9.8.98 The Scheme will avoid and minimise direct impacts upon ditches by utilising existing crossings for access wherever possible. The number of new ditch crossings is anticipated to be very small and as such proportionately very little of the overall ditch and watercourse network. The small size of any crossings required will not result in any significant fragmentation effects on the local ditch/watercourse network. Consequently, a **neutral effect** on the extent and state of ditches and watercourses relevant to the Scheme is anticipated. However, this preliminary assessment will need to be revisited once the extent of ditch/watercourse crossings has been finalised.

9.8.99 Without the implementation of protective buffer zones, there is a risk that the existing habitat may be damaged or degraded through direct construction damage or indirect impacts such as the release of sediments or dust which could flow into connected watercourses off site. Accidental pollution events are considered unlikely, but if they were to occur they would potentially have a detrimental effect on the quality of habitats on site and downstream beyond the Site in the short to medium term depending on severity. The Scheme has, however, been designed to implement

buffer zones free of development at least 8m from every ditch and between 15-30m for larger watercourses. In addition, protective measures will be incorporated into the CEMP, including fencing and steps to minimise the risk of accidental pollution or sediment mobilisation.

9.8.100 It should also be noted that a certain amount of dust deposition and run off would be anticipated as a result of routine annual agricultural activities and as such effects are likely to be similar to the current baseline conditions. Nevertheless, given the large extent of this habitat present at the site, effects from dust deposition and/or run off are considered to have the potential to result in detrimental impacts.

9.8.101 Given that the locations of ditch/watercourse crossing points, and the methodology of cable route installation to be used have not been finalised at the time of writing, it is considered that **insufficient information** is currently available to fully evaluate the scope and significance of any potential construction phase impacts on ditches and watercourses. A full impact assessment on these features will be included in the ES.

*Operational Phase Impacts*

9.8.102 Water quality can be expected to significantly increase post-development due to the anticipated reversion to permanent grassland under the arrays (likely resulting in reduced sediment run-off when compared with arable systems) and the cessation of application of fertilisers and pesticides.

9.8.103 The sympathetic management of field margin habitats which will be detailed within the eventual LEMP can be expected to benefit the biodiversity value of the ditch network through the proliferation of marginal wetland species following a reduction in management (cutting) frequency and agricultural inputs.

9.8.104 The risk of ongoing pollution or damage from routine maintenance operations is anticipated to be minimal given the general restriction of vehicle movements to made-up tracks and the imposition of development free buffer zones between hardware and ditch habitats.

9.8.105 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially degrade the water quality of the connecting ditches and watercourses. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the **Chapter 10: Hydrology, Flood Risk and Drainage**, and the **Chapter 22: Ground Conditions and Contamination** chapter.

9.8.106 Given the general lack of impact pathways to ditches and watercourses during the operational phase, plus the embedded mitigation measures to address the risk of a BESS fire, **no significant adverse effects** are anticipated to arise during the operational phase, and no additional mitigation measures are considered to be required. Following the successful implementation of sensitive management measures secured through the LEMP, it is anticipated that the Scheme would likely result in a **significant beneficial residual effect** on the quality of the local ditch and watercourse network, which would be significant at a **Local** to **District** level.

*Enhancement Measures*

9.8.107 The opportunity for practicable ditch and watercourse management, including vegetation clearance (for choked ditches) or planting of locally appropriate wetland marginal species will be explored through consultation with local conservation stakeholders and consultees.

**Species**

**Badgers**

*Construction Phase Impacts*

9.8.108 Badgers may be adversely impacted by the proposed development through loss of habitat in which to build setts, accidental direct harm during construction, disturbance by vehicles and personnel or the compaction of soil around setts.

9.8.109 Development free buffer zones of 15m and 30m around all known setts according to their status have been designed into the Scheme and will be implemented for the lifetime of the Scheme. Therefore, no losses of badger setts during the construction phase are currently anticipated. However, as badgers can dig new setts in very short spaces of time, any new setts excavated within the construction areas may need to be excluded prior to construction commencing in that area. Given that the scope of exclusion works of any potentially newly excavated setts cannot be identified, the significance of this potential impact cannot be assessed at this stage.

9.8.110 Perimeter security fencing is not considered to be a barrier to badger movement given their propensity for digging (the security fencing is not proposed to be buried). Badger gates are not considered necessary within security or protective fencing as there is no evidence of their usage from information gathered from extensive monitoring of active solar sites. Badgers are known to preferentially dig under fencing or move through gaps in the fencing material as opposed to actively seek features such as gates. Natural undulations in the ground should be used to ensure sufficient space beneath fencing to facilitate badger access is available. Where no such undulations occur, it is considered most effective to raise the height of fencing panels to leave a narrow gap (no greater than 100mm) which badgers (among other animals) will exploit to gain access. These embedded measures will be considered during the design and construction of the Scheme. As a result, no additional mitigation measures such as badger gates to facilitate the movement of badgers through the Sites are deemed to be required, and **no significant adverse effects** associated with habitat fragmentation are anticipated.

9.8.111 There will be a temporary reduction in the extent of foraging habitat available to badgers due to the loss of the arable habitats, until new habitats establish. However, badgers are highly mobile and the temporary loss of habitats within the Sites during construction is anticipated to be similar in effect (i.e. causing disturbance or temporary displacement to badgers) to the regular agricultural activities or harvesting, sowing, harrowing and rolling that take place across much of the Scheme at present. It is considered that the Sites would become suitable again for badgers immediately once works in a particular area are completed. As a result, **no significant effects** arising from the loss of habitat or displacement/disturbance during the construction phase are anticipated.

9.8.112 During the construction phase, if deep trenches are left open overnight or high voltage machinery is present, there may be potential for incidental injury or mortality to badgers exploring the site during the night. Should this result in the death of individual badgers, this would constitute a **significant adverse effect** at the **Site** level and may also constitute an offence under the Wildlife and Countryside Act 1981 (as amended).

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.113 Prior to construction commencing across the Scheme, an update badger survey would be completed, in order to identify any newly constructed setts within the working area. Should any setts be identified at this stage, a mitigation strategy would be devised, following the mitigation hierarchy. Should impacts to these setts during the construction phase be unavoidable through careful planning of the works, then these setts would likely be excluded under a mitigation licence from Natural England. The mitigation licence would ensure that any compensation measures (such as the creation of artificial setts) required would be implemented prior to the exclusion of the sett/s.

9.8.114 In order to further minimise the risk of impacts to badgers and their setts during the construction phase, all contractors will be informed about the presence of setts via a toolbox talk delivered by an ecologist prior to construction works commencing within a particular working area. No machinery will be driven within the designated ecological buffers, or materials stored in them.

9.8.115 The CEMP will detail measures to be taken to reduce the probability of incidental mortality of badgers, especially in situations where open excavations are made and in respect of site speed limits.

9.8.116 Following the implementation of the above buffer zones and mitigation measures during the construction phase, it is considered that any potential adverse effects on badgers and their setts arising during the construction phase could be avoided. As a result, no further mitigation measures are deemed to be required, and **no residual effects** are anticipated.

*Operational Phase Impacts*

9.8.117 During the operational phase, badgers are likely to benefit from an improved abundance of favoured food items within the grassland under the arrays, as permanent grassland has been shown to contain a greater abundance of earthworms and soil invertebrates than arable soils.

9.8.118 Further potential beneficial effects include reduced disturbance or habitat degradation during the operational phase compared to baseline levels, primarily due to the cessation of agricultural activities and increased sheltering and dispersal habitat cover due to new hedgerow and tree planting and grassland habitat creation.

9.8.119 With the embedded buffer zones in place, badgers are not considered likely to be affected by ongoing operational maintenance or during replacement of panels and batteries. Routine maintenance will also not typically be conducted during the hours of darkness.

9.8.120 Given the general lack of potential impact pathways to badgers during the operational phase, no adverse impacts are anticipated to arise. Following the implementation of the buffer zones and the deliverance of the soft landscaping measures described in the LEMP which will be submitted with the ES, it is anticipated that the Scheme would result in a **beneficial residual effect** on badgers, which would be significant at the **Site** level.

9.8.121 It is considered highly unlikely that any new badger setts would be excavated within the main body of the arrays, such that there would be potential conflict with ongoing operation activities. However, this possibility cannot be ruled out. If setts were damaged or disturbed by operational activities, this would constitute a **significant adverse effect** at the **Site** level and may also constitute an offence under the Wildlife and Countryside Act 1981 (as amended).

*Operational Phase Additional Mitigation Measures and Residual Effects*

9.8.122 Should new setts be excavated in areas where they come into conflict with ongoing management activities, then these setts would likely be excluded under a mitigation licence from Natural England. The mitigation licence would ensure that any compensation measures (such as the creation of artificial setts) required would be implemented prior to the exclusion of the sett/s.

9.8.123 Following the implementation of the above mitigation measures, it is considered that any potential adverse effects on badgers and their setts arising during the operational phase could be avoided. As a result, **no residual effects** are anticipated.

**Bats**

*Roosting Bats – Construction Phase Impacts*

9.8.124 Many trees with suitability for roosting bats were recorded on Site within hedgerows, tree belts and woodland edges. Any loss of trees capable of supporting roosting bats could result in direct harm, population fragmentation and habitat degradation. However, the retention of individual in-field trees has been embedded into the design of the Scheme at an early stage, and trees will be retained wherever possible. Such trees act as islands or stepping-stones for wildlife, and these are to be buffered from development according to their ecological value and suitability for roosting bats (between 8m and 15m from extent of Root Protection Zone). Should the loss of any trees be unavoidable, then additional mitigation measures will be required to ensure that potential impacts upon roosting bats are fully considered and mitigated/compensated for as appropriate.

9.8.125 Artificial lighting at night can impact the activity of roosting bats, including through delaying emergence times or even preventing bats from leaving a roost. This may result in reduced

foraging times and thereby reduced health of the bats, or even death from 'entombing' the bats inside their roost. No artificial lighting is considered likely to be required during construction outside of the winter months, however, during winter, artificial lighting may be required within the construction zone due to the short day lengths. Bats are in hibernation during the winter months, and only active occasionally for short periods; but could be significantly affected if lighting prevents their emergence form a roost at key periods when they need to forage to maintain their body condition. Embedded mitigation measures include buffer zones around trees with bat roosting potential, which are proportionately sized to the likelihood of a roost being present. These buffers will reduce the likelihood of any light spill impacting the roost. Further surveys are scheduled of buildings which lie within or close to the Scheme boundary (which could support roosting bats). The outcome of these surveys will inform appropriate buffers from these buildings. Additionally, a sensitive lighting strategy will be implemented whereby all artificial lighting is designed and installed to limit light spill onto known or potential bat roosting habitat. Therefore, should artificial lighting in winter be required, **no significant impacts** are anticipated.

9.8.126 There is also the potential for roosting bats utilising existing buildings within the Sites to become isolated should any linear habitat features (such as hedgerows) which provide connectivity between building roosts and the local landscape, be lost or degraded. This potential impact pathway will be assessed following the finalisation of the Scheme design. The assessment will be informed by building inspections where appropriate, in order to assess the suitability of any potentially affected buildings to support roosting bats.

9.8.127 It is considered that **insufficient information** is currently available to fully assess potential impacts on roosting bats associated with the loss of trees or buildings, as well as through the potential isolation of roosts through the fragmentation of key connecting habitats. The scope and significance of any losses of features suitable for roosting bats will be assessed following the finalisation of the Scheme design and the completion of building inspections for roosting bats (where required), and a detailed assessment will be provided in the ES chapter.

*Roosting Bats – Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.128 Any trees for which removal is unavoidable will be re-investigated closely, either through a climbing inspection and the use of video endoscopes (where possible), or through the completion of emergence surveys, to determine the presence or likely absence of roosts. Similarly, any potential roosts in buildings which may be subject to isolation/habitat fragmentation impacts will be identified through the completion of building inspection surveys and subsequent dusk emergence surveys where required. The loss of any roost will need to be covered under a licence from Natural England, but all alternatives will be explored beforehand.

9.8.129 It is fully intended that all reasonable steps will be taken to ensure that the Scheme results in **no adverse residual effects** on roosting bats during the construction phase, however this preliminary assessment will be revisited in the ES.

*Roosting Bats – Operational Phase Impacts*

9.8.130 No external artificial lighting is due to be used within the operational Scheme, other than luminaires installed at substations and battery storage facilities (and not within the arrays themselves). These will only be used when necessary, such as for maintenance, rather than year-round. Luminaires installed will be downward facing so as to avoid light spill onto surrounding trees or buildings with known or potential roosts. Therefore, **no significant impacts** are anticipated from the use of operational lighting.

*Foraging/Commuting Bats – Construction Phase Impacts*

9.8.131 The hedgerows, woodland edges, grassland fields, and the ditches and watercourses were considered to be the habitats of highest value for foraging and commuting bats on Site. While the existing field accesses will be utilised in the vast majority of cases, losses of short (3-6m) sections of hedgerow will be unavoidable in a small number of cases; the extent of which will be determined following the finalisation of the Scheme design. Pending the final allocation of new gaps, they are highly likely to constitute a very small proportion of the overall hedgerow network, and unlikely to significantly fragment foraging or commuting routes used by bats. The species recorded within

the Sites to date are considered able to overcome hedgerow gaps of 3-6m (as per existing hedgerow gaps at baseline) when dispersing. At this stage, it is considered that a low number of new gaps would be unlikely to have an impact upon the favourable conservation status of the bat assemblage present within the Sites, and **no significant effects** arising from hedgerow loss during the construction phase are anticipated. This preliminary assessment will be revisited in the ES chapter following the finalisation of the Scheme design and completion of all bat activity surveys, which are currently ongoing.

9.8.132 The removal of the arable crops will result in a temporary reduction in available foraging habitat, albeit habitat of low suitability, until new habitats establish. This is likely to reduce the availability of invertebrate prey for foraging bats in the short-term. Temporary habitat loss impacts are considered to be **non-significant**.

9.8.133 Artificial lighting at night can dissuade bat activity, impact the behaviour of invertebrate prey, and potentially fragment commuting routes for particularly light-averse species. No artificial lighting is considered likely to be required during construction outside of the winter months, however, during winter, artificial lighting may be required within the construction zone due to the short day lengths. Embedded mitigation measures include buffer zones from the most valuable foraging and commuting habitats, such as hedgerows, woodland and watercourses. Additionally, a sensitive lighting strategy will be implemented, as detailed in the CEMP, whereby all artificial lighting is designed and installed to limit light spill onto these habitats. As such, the likelihood of light spill onto key foraging and commuting habitats is very low. Furthermore, as bats are in hibernation during the winter months, and only active occasionally for short periods, they are unlikely to be significantly affected by the use of artificial lighting during the winter months. Therefore, should artificial lighting in winter be required, **no significant impacts** are anticipated.

*Foraging/Commuting Bats – Operational Phase Impacts*

9.8.134 The effects of the installation of solar panels on bat activity and the activity of their prey is largely unknown. There is research to suggest a potential displacement effect of arrays on foraging and commuting bats (Ref.53), with reduced activity levels observed by some species among arrays compared to control sites. However, numerous issues have been identified with this study, including a lack of baseline (pre-development) data on both habitat type and bat activity, as well as a short window of sampling. Furthermore, the microphone height for the detectors was set at 1.27m (around the mid-height of panels), which may have precluded detection and account for the observed apparent reduction in activity levels. More research is needed in this area, however, it is probable that any adverse impacts on bats will be largely neutral; particularly when considering the likely higher value of the habitats present within the operational site (predominately comprising permanent grassland) over the baseline of largely arable land, together with the large development-free buffer zones which are comparatively wider than other similar schemes and retain the best habitat. As a result, **no significant adverse effects** associated with the constructed Scheme for foraging/commuting bats are currently anticipated. This assessment will be revisited upon the completion of the bat activity surveys which are currently ongoing across the Scheme, and a detailed assessment (including a review of any new literature on the subject) will be presented in the ES chapter.

9.8.135 External lighting is only to be installed at substations and battery storage facilities (and not within the arrays themselves) and will only be used when necessary. Luminaires installed will be downward facing so as to avoid upward light spill. Any adverse impacts associated with artificial lighting during the operational phase are therefore anticipated to be infrequent, short-term and **non-significant**.

9.8.136 With the successful implementation of the habitat creation and enhancement measures which will be detailed in the LEMP, as well as the successful management of the habitats within the Sites for the benefit of biodiversity, it is considered that residual effects on foraging/commuting bats during the operational phase would be in the worst case **neutral and not significant**. The potential exists for habitat connectivity, the diversity and abundance of night flying invertebrates, as well as roosting opportunities, to increase in the long term as a result of the Scheme. These factors have the potential to confer a **significant beneficial effect** on the bat population at a **Local** level, provided that management objectives are successfully realised.

*Enhancement Measures*

9.8.137 The planting of trees and new hedgerows, as well as the enhancement of those habitats being retained, would likely increase the permeability of the landscape and overall habitat diversity and quality for bats. These measures would also increase foraging resource availability and may also provide additional roosting opportunities in the long term. The habitat creation and enhancement measures anticipate to arise through the Scheme would likely provide a **long-term, significant beneficial effect** on bats at the **Local** level.

9.8.138 Beneficial effects are likely to arise from the increased capacity of the newly-sown and managed grasslands under and around the panels to support flying invertebrates compared to arable land; thereby improving access to foraging resources for bats. This will constitute a **long-term, significant beneficial effect** at the **Local** level.

9.8.139 The opportunity to create new waterbodies and wetland features, which would further increase the abundance and diversity of invertebrate foraging resources for bats, will be explored in conjunction with flood attenuation requirements.

9.8.140 The inclusion of new bespoke tree- and building-mounted bat roosting features is proposed. These features will be specified in the LEMP and will provide a greater number of potential roosting features in the landscape and may constitute a long-term beneficial effect, should they be utilised by roosting bats.

**Otters and Water Voles**

*Construction Phase Impacts*

9.8.141 Barriers to movement in the form of severed or blocked/culverted watercourses and linear natural features arising through the creation of new accesses or cable installation may cause population fragmentation. However, it is not known at this stage how many new ditch/watercourse crossings will be required and their design/form that they will take. It is therefore considered insufficient information is currently available to fully evaluate the scope and significance of habitat fragmentation impacts on otters and water voles during the construction phase. This potential impact pathway will be re-assessed following the finalisation of the Scheme design.

9.8.142 Otters and water voles may be impacted through direct harm (to individual animals or their burrows) or disturbance during any construction activity affecting ditches, watercourses and associated adjacent scrub, hedgerows or woodland habitat. Construction activities and the use of vehicles and construction equipment in the vicinity of watercourses may also cause disturbance to otters and water voles within shelter, as well as accidental damage to their habitat or burrows. The design of the Scheme is such that buffer zones will be installed prior to the onset of the construction phase, limiting movements of construction vehicles, plant, personnel and material within at least 8m (and up to 30m) of every ditch and watercourse, based on their size/status. Additionally, where ditches and watercourses require unavoidable crossing or reinforcement of existing crossings, these locations will be subject to inspection prior to commencement of development activities in order to detect any holts, resting sites or burrows. Where otter holts are present, such as along the western boundary of Green Hill E, these will be monitored prior to construction works commencing. If the holt is active and construction works are liable to cause disturbance, mitigation measures (potentially including a licence from Natural England, if required) will be implemented to either avoid impacts, or to permit temporary disturbance of the holt. These embedded mitigation measures will ensure that damage to ditches and watercourses which may support otter and water vole, as well as disturbance related impacts and the potential for direct harm to individuals, are avoided as far as possible. These measures will be detailed in, and secured by, the CEMP.

9.8.143 Riparian habitat quality is at risk of degradation through pollution resulting from run-off, sediment/dust deposition and contamination during the construction phase, although it should be noted that these features are likely subject to a baseline level of run-off and sediment deposition arising from the existing arable systems. The above ecological buffers have also been designed into the Scheme to help avoid/ameliorate any habitat degradation impacts. In addition, protective

measures will be incorporated into the CEMP, including the use of fencing and steps to minimise the risk of accidental pollution or sediment mobilisation.

9.8.144 The detail of all protective measures to safeguard the suitability of habitats on Site for otters and water voles will be set out in the CEMP. Taking into account the CEMP requirements, residual effects upon otters and water voles are currently anticipated to be **neutral and not significant**. This preliminary assessment will be revisited once the scope of construction work required in proximity to watercourses (such as watercourse crossing points along the Cable Corridor), as well as the construction methodology to be used in these areas, has been finalised.

*Operational Phase Impacts*

9.8.145 Operational impacts are expected to be minimal as vehicle movements will be infrequent and limited, taking place outside of the installed buffer zones, or only at designated access points which cross watercourses. This will significantly limit the risk of disturbance, pollution and damage impacts.

9.8.146 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially kill or injure water voles. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the **Chapter 10: Hydrology, Flood Risk and Drainage**, and **Chapter 22: Ground Conditions and Contamination**.

9.8.147 As a result of embedded mitigation measures, **no significant effects** on otter and water vole arising from routine management during the operational phase are anticipated.

9.8.148 The LEMP will secure the favourable management of the site's buffer zones for the duration of the scheme, thereby maintaining and potentially enhancing the habitat quality of ditches within and adjacent to the Scheme boundary. A beneficial effect may be possible through the enhancement of ditches and watercourses to make previously sub-optimal ditches more favourable for these species. The scope of any watercourse enhancements to be delivered will be detailed within the LEMP which will be submitted with the ES Chapter.

*Enhancement Measures*

9.8.149 The opportunity to enhance existing watercourses where otters and/or water voles have been recorded, or those connected to such features which have the potential to support these species, will be explored with advice from local conservation organisations. This may include improving the water retention of such features, as well as targeted Introduced Non-Native Species (INNS) programmes for American mink (see 9.8.261).

**Other Mammals – Brown Hare**

*Construction Phase Impacts*

9.8.150 Brown hares do not utilise burrows and instead raise their young leverets in scrapes (shallow indentations in the middle of fields). Although the leverets are precocial from birth, there is still a small risk of injury or mortality from construction activities. Hares breed between January and August and during these periods, the potential for impacts upon hares may be slightly greater than at other times of year. Should it occur, the injury or mortality of individual brown hares during the construction phase would likely only constitute a **significant adverse effect** at the **Site** level, given the small proportion of the local population of hares which would likely be affected.

9.8.151 Hares are highly mobile and the temporary loss of habitats within the array sites during construction is anticipated to be similar in effect (i.e. causing disturbance or temporary displacement to hares) to the regular agricultural activities or harvesting, sowing, harrowing and rolling that take place across much of the Scheme at present. It is considered that the Sites would become suitable again for hares immediately once works in a particular area are completed. As

a result, **no significant effects** arising from the loss of habitat or displacement/disturbance during the construction phase are anticipated.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.152 The CEMP will detail how a 10mph speed limit will be applied across the construction sites, as well as how the existing arable habitats will be cleared or left fallow prior to construction. It will also detail that, as part of their induction, construction staff will be informed of the potential presence of protected species including hare as well as the need to temporarily cease works and implement an exclusion zone in the unlikely event that dependent leverets are discovered within a working area.

9.8.153 Assuming the successful implementation of the above additional mitigation measures, as well as the fact that the anticipated levels of disturbance/habitat clearance during the construction phase are likely similar to that of baseline levels during routine agricultural activity, **no significant residual effects** on brown hare during the construction phase are anticipated.

*Operational Phase Impacts*

9.8.154 Operationally, the cessation of intensive arable farming and expected reversion of land to sheep grazed or cut permanent grassland is likely to benefit hares, particularly through the cessation of regular disturbance from ploughing and harvesting. The solar panels also appear to be attractive sheltering features for brown hares avoiding predators and inclement weather. Monitoring carried out over large numbers of active solar arrays indicates that hares appear to benefit from the access to grazing and foraging beneath panels, being found in relatively high densities within solar arrays at sites where hares were recorded pre-construction. This may be due to either improved abundance or quality of foraging resources, or improved predator avoidance within an array. As a result, a beneficial effect in the availability of foraging is anticipated.

9.8.155 Security or protective fencing is not considered to impede the movement of hares within or into the Sites. As such, **no significant adverse effects** associated with habitat fragmentation or population isolation as a result of the installation of security fencing are anticipated.

9.8.156 Assuming the successful implementation of the habitat creation and management measures which will be detailed in the LEMP submitted with the ES, effects on brown hares during the operational phase are anticipated to be, in the worst case, neutral, and may be beneficial in the long term as targeted habitats establish.

**Other Mammals – Harvest Mouse, Hedgehog and Polecat**

*Construction Phase Impacts*

9.8.157 These species are all potentially present at the Site, likely in low to moderate densities given the suboptimal to moderate habitat suitability for them (predominantly managed hedgerows and field margins). It is probable this is also the case within the Cable Route Search Area, although this will be confirmed following the completion of the habitat walkover assessment of the Cable Corridor.

9.8.158 Impacts upon these species may arise from direct harm and mortality through movement of vehicles and clearance of habitat associated with the creation of new access gaps in hedgerows, where necessary, and the trenching of cables at or close to field boundaries. The CEMP will detail precautionary methods of working during any necessary clearance of boundary habitats associated with creating new access gaps, as well as trenching of cables. Measures incorporated into the CEMP may include sensitive seasonal timing of works, the presence of an Ecological Clerk of Works and phased habitat removal, in order to safeguard a wide variety of species which may be present within the existing habitats. All cable trenching works will be followed by the reinstatement of any lost boundary habitats. When considering the mitigation measures embedded within the eventual CEMP, it is considered that the risk of direct harm and mortality of hedgehog and polecat can be minimised as far as is reasonably practicable. As a result, **no significant effects** associated with this impact pathway are anticipated.

9.8.159 Disturbance during the construction period may also cause some temporary displacement of these species. The temporary loss of habitats within the array sites during construction is

anticipated to be similar in effect (i.e. causing disturbance or temporary displacement to individual animals) to the regular agricultural activities or harvesting, sowing, harrowing and rolling that take place across much of the Scheme at present. It is considered that the Sites would become suitable again for hedgehog and polecat immediately once works in a particular area are completed. As a result, **no significant effects** arising from the loss of habitat or displacement/disturbance during the construction phase are anticipated.

*Operational Phase Impacts*

9.8.160 Adverse impacts on harvest mouse, polecat and hedgehog during the operational phase are likely to be minimal, considering the adoption of ecological buffer zones and the restriction of development and vehicle movement to outside of these zones, save for periodic habitat management operations.

9.8.161 The LEMP will include a significant proportion of tussocky grassland habitat creation and management, both within buffer zones and beneath arrays. Furthermore, significant lengths of new hedgerow and tree planting is proposed. Buffer zones will be wider than existing uncultivated field margins throughout the Scheme. These measures will increase the abundance of field margin habitat of suitability to these species. Connectivity and dispersal corridors for these species would likely increase, along with a reduction in disturbance and degradation of habitats from routine agricultural practices. Overall, the cessation of intensive agricultural land use and reversion of the land to low-input grasslands would likely result in a **significant beneficial effect** at the **Local** level for harvest mouse, hedgehog and polecat.

9.8.162 Perimeter security or protective fencing is not considered to impede the movement of harvest mouse, hedgehog or polecat within or into the Sites. As a result, no additional mitigation measures, beyond those described in paragraph 9.8.110, are deemed to be required. Therefore, assuming the successful implementation of the embedded mitigation measures detailed in 9.8.110, **no significant effects** arising from the presence of perimeter security fencing throughout the operational phase are anticipated.

9.8.163 Taking into account the cessation of impacts arising from the current land use within the Scheme's boundary (predominately intensive arable farming), as well as the embedded mitigation and enhancement measures detailed in the CEMP and LEMP, overall a **residual beneficial effect** would be expected on harvest mouse, polecat and hedgehog, which would be significant at the **Local** level.

*Enhancement Measures*

9.8.164 The creation of enhancement features such as habitat piles created from logs and brash will provide an increased number of shelter resources for hedgehog.

**Amphibians (including Great Crested Newt)**

*Construction Phase Impacts*

9.8.165 Almost universally, the Scheme will be sited on land of low habitat quality for amphibians, being restricted to narrow uncultivated field margins, hedgerows and sporadic pockets of woodland edge.

9.8.166 All ponds within the Scheme are currently proposed to be retained, and protected through the construction and operational phases through the implementation of buffers within the final Scheme design, within which no construction work or storage of materials will take place.

9.8.167 Potential impacts upon these amphibians during the construction phase may include terrestrial habitat degradation and terrestrial habitat loss should any clearance of hedgerows or other field boundary habitats be required for access or cable trenching, although this is likely to be very limited as the intention is to use existing field accesses wherever possible. These impacts are likely to be avoided through the retention and incorporation of generous ecological buffer zones around the most suitable terrestrial habitats for amphibians during construction and operation of the Scheme, generally measuring wider than existing field margins. Where limited numbers of new hedgerow breaches for site access are required, some minor habitat loss can be expected, although the lengths involved (anticipated to be 3-6m) are not considered likely to result in a

significant loss of habitat in the context of the Scheme. As a result, **no significant adverse effects** on the extent of terrestrial habitats are anticipated as a result of the Scheme.

9.8.168 Groundworks associated with the construction phase may result in the accidental direct harm to individual amphibians, should they be present within working areas. In the absence of additional mitigation measures, the accidental killing/injury of amphibians (including great crested newts) during the construction phase would likely result in a **significant adverse effect** at the **Local** level, although clearly the magnitude of this impact would depend on the extent to which amphibians were killed/injured during construction. Similarly, given that great crested newt surveys have not been completed across the Scheme (given that it is currently intended to register the Scheme under District Licensing), the potential populations of great crested newts present within the Scheme are currently unknown. It is therefore possible that this effect could be felt at a more significant geographical scale.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.169 In order to minimise the risk of accidental killing/injury of amphibians during the construction phase, the Outline CEMP submitted with the ES will set out the supervision and protective measures required during works affecting potentially suitable habitat for amphibians at field boundaries, for example where new hedgerow gaps for access or cabling are required. These will include sympathetic, staged habitat clearance and timing and the supervision of an ecologist where necessary. Measures to ameliorate the risk of accidental killing/injury of great crested newts within specific high-risk zones within the Scheme will also be incorporated into the Best Practice Principles associated with the District Licence, when this is approved. Measures implemented in each case will be proportionate to the suitability of the habitats within the working area, as well as the District Licensing Impact Risk Zone that each working area falls within. When considering these additional mitigation measures, it is considered that this potential effect can be reduced to **neutral, non-significant levels**.

*Operational Phase Impacts*

9.8.170 Adverse impacts on amphibians during the operation of the Scheme are likely to be minimal, considering the adoption of ecological buffer zones and the restriction of development and vehicle movement to outside of these, save for habitat management operations.

9.8.171 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially kill or injure amphibians in the affected watercourses. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the **Chapter 10: Hydrology, Flood Risk and Drainage**, and **Chapter 22: Ground Conditions and Contamination**.

9.8.172 Habitat management operations will be timed appropriately to minimise the risk of harming amphibians, with all details provided in the LEMP. Habitat management within and close to the 20m buffer zone surrounding all ponds within the Scheme will be tailored to maximise the value of this area of terrestrial habitat for amphibians, particularly through the encouragement of tussocky grassland and scattered scrub.

9.8.173 When considering the above embedded mitigation measures, **no significant adverse impacts** on amphibians are anticipated to arise during the operational phase. The retention and favourable management of the ponds and surrounding terrestrial vegetation, as well as the reversion of arable land within the Scheme to permanent grassland, is likely to result in a **long-term beneficial effect** for amphibians, which would be significant at the **Local** – **District** level.

9.8.174 It is currently anticipated that the Scheme will be registered under the District Licensing scheme for great crested newts, in order to mitigate potential impacts such as habitat loss and degradation during the construction phase. Offsite mitigation delivered through this scheme will comprise the

creation of new ponds in strategic locations within the local landscape. When considering the ponds created under the District Licensing Scheme, as well as the fact that no existing ponds within the Scheme are proposed to be lost, the Scheme is anticipated to result in a **significant beneficial effect** in the extent of ponds in the local landscape, and by extension, the extent of suitable breeding habitat for great crested newts and other amphibians, which would be significant at a **Local-District** level.

*Enhancement Measures*

9.8.175 There will be a net increase in the extent and/or quality of both terrestrial and aquatic habitats as a result of the Scheme. This will provide enhanced amphibian habitat for the lifetime of the Scheme, as a minimum. Opportunities to create new wildlife ponds will be explored during the next design stages of the Scheme. These would provide additional opportunities for breeding amphibians.

9.8.176 Specific habitat features such as log piles and hibernacula, as well as habitat management prescriptions, will be incorporated into the LEMP in locations within the Sites considered to be of greatest value to amphibians.

**Reptiles**

*Construction Phase Impacts*

9.8.177 Almost universally, the Scheme will be sited on land of low habitat quality for reptiles, being restricted to narrow uncultivated arable field margins, occasional fields of tussocky grassland, hedgerows and sporadic pockets of woodland edge.

9.8.178 Potential impacts upon reptiles during the construction phase may include habitat degradation and loss, should any clearance of hedgerows or other field boundary habitats be required for access or cable trenching, although this is likely to be very limited as the intention is to use existing field accesses wherever possible. These impacts are likely to be avoided through the retention and incorporation of generous ecological buffer zones around the most suitable habitats for reptiles during construction and operation of the Scheme. Where limited numbers of new hedgerow breaches for site access are required, some minor habitat loss can be expected, although the lengths involved (anticipated to be 3-6m) are not considered likely to result in a significant loss of habitat in the context of the Scheme. Furthermore, the retention of the most suitable fields of tussocky grassland has been incorporated into the design of the Scheme from an early stage. As a result, **no significant adverse effects** on the extent of terrestrial reptile habitats are anticipated as a result of the Scheme.

9.8.179 Groundworks associated with the construction phase may result in the accidental direct harm to individual reptiles, should they be present within working areas. In the absence of additional mitigation measures, the accidental killing/injury of reptiles during the construction phase would likely result in a **significant adverse impact** at the **Site** level, given that the majority of habitats likely to be affected during construction are sub-optimal for reptiles.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.180 In order to minimise the risk of accidental killing/injury of reptiles during the construction phase, the Outline CEMP submitted with the ES will set out the supervision and protective measures required during works affecting potentially suitable habitat for reptiles, for example where new hedgerow gaps for access or cabling are required. These will include sympathetic, staged habitat clearance and timing and the supervision of an ecologist where necessary, and measures implemented in each case will be proportionate to the suitability of the habitats within the working area. When considering these additional mitigation measures, it is considered that this potential effect can be reduced to **neutral, non-significant levels**.

*Operational Phase Impacts*

9.8.181 Adverse impacts on reptiles during the operation of the Scheme are likely to be minimal, considering the adoption of ecological buffer zones and the restriction of development and vehicle movement to outside of these, save for habitat management operations.

9.8.182 Habitat management operations will be timed appropriately to minimise the risk of harming reptiles, with all details provided in the LEMP.

9.8.183 When considering the above embedded mitigation measures, **no significant adverse impacts** on reptiles are anticipated to arise during the operational phase. The retention and favourable management of areas of tussocky grassland and suitable arable field margins, as well as the reversion of arable land within the Scheme to permanent grassland, is likely to result in a **long-term beneficial effect** for reptiles, which would be significant at the **Local** level.

*Enhancement Measures*

9.8.184 Specific habitat features such as log piles and hibernacula, as well as habitat management prescriptions, will be incorporated into the LEMP in locations within the Sites considered to be of greatest value to reptiles.

**Breeding Birds – Ground Nesting Birds of Open Habitats**

*Construction Phase Impacts*

9.8.185 Installation of arrays will displace ground-nesting bird species which preferentially nest in open habitats with long sightlines. The most likely species of conservation concern to be most impacted by development of the open habitats are skylark, yellow wagtail and lapwing. Detailed territory analysis indicates that 281 skylark territories are present within the Sites, although surveys at Green Hill A.2 are not yet completed, and so this number may change. Territory numbers are considerably smaller for yellow wagtail, and this species also has a more restricted distribution through the Sites; breeding at Green Hill E, F and G only. Only a handful of likely territories exist for lapwing at Green Hill B only. These species are considered likely to be displaced to a significant degree owing to the imposition of tall structures and other hardware into the arable fields. Yellow wagtail may stand to be displaced the least as they are believed to be able to nest in taller habitats and with shorter sightlines. Displacement may lead to population fragmentation and increased intra-specific pressures on surrounding arable and grassland habitat which may be at, or approaching, carrying capacity.

9.8.186 Entire fields have been removed from the developable area of the Scheme due to various constraints during the design phase. A proportion of these fields may be utilised to deliver ground nesting bird mitigation within the Scheme, however design proposals are yet to be finalised.

9.8.187 In the absence of additional mitigation, the above species would be permanently (for the lifetime of the Scheme) displaced, which would likely constitute a **significant adverse effect at a District level**. The scope of embedded mitigation for ground nesting birds delivered within the Scheme boundary may reduce the geographical scope of this effect. A full assessment will be provided in the ES.

9.8.188 Corn bunting, grey partridge and quail are additional ground-nesting species which were recorded within the Sites. These species are more likely to be found nesting towards the edges of fields, and within hedgerows and ditch banks, although not exclusively. It is considered that the nest habitat requirements of these species are less particular than those above as they are able to exploit scrub, woodland-edge and field boundary habitats and therefore are likely to persist, at least to a moderate degree, within the developed Scheme. The establishment of wide margins from boundaries as part of the proposals will also serve to improve potential nesting and foraging habitats at the edge of the arrays. Impacts of solar development on these species are largely unknown, therefore a precautionary approach should be taken, and a moderate level of displacement is assumed in the absence of additional mitigation. This would likely constitute a **significant adverse effect** at the **Local** level**.**

9.8.189 There is the potential for accidental mortality to these birds during site clearance or preparation procedures at the onset of construction, for both the array and cable routes. Quail also receive protection from disturbance when nesting owing to their Schedule 1 status under the Wildlife & Countryside Act, and works may disturb this species if conducted during the nesting season. The CEMP will detail nest avoidance precautions to be taken during the construction phase at both the array sites and cable route. These will comprise measures such as seasonally timed working, the presence of an Ecological Clerk of Works and the setting up of exclusion zones around nesting

sites. The temporary nature of the cable installation means disturbance would be very time-limited for any particular location. Similarly, the very limited land-take of the cable installation means that the likelihood of encountering nests is low. When considering the above embedded mitigation measures, it is considered that the likelihood of individual mortality occurring during the construction phase is very low, and therefore this effect could likely be reduced to **neutral and non-significant** levels.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.190 Measures to mitigate for the displacement effects on skylark, yellow wagtail and lapwing from the array Sites are currently being explored. These are likely to consist of favourable management practices on suitable areas of grassland or arable farmland outside the footprint of the arrays, which have the aim of increasing the carrying capacity of this land so as to 'absorb' a significant proportion of displaced territories from the Site. Such areas of land will also be usable by species such as corn bunting, grey partridge and quail. The approach to mitigation will be discussed with relevant stakeholders, with the intention being to implement a district-wide mitigation strategy. All mitigation sites will be managed under the terms of prescriptions contained within an eventual LEMP.

9.8.191 It is currently considered that there is **insufficient information** at this stage to accurately predict the residual effects on skylark, yellow wagtail and lapwing as mitigation measures have not been fully designed, although provision of compensatory habitat manged for ground-nesting birds, in conjunction with the increased foraging productivity within the Site, should reduce residual effects on these species substantially. A detailed assessment will be provided in the ES.

9.8.192 For corn bunting, grey partridge and quail, it is predicted that nesting will continue to occur within the Site. Additionally, provision of compensatory habitat manged for ground-nesting birds, in conjunction with the increased foraging productivity within the Site, should reduce residual effects on these species substantially. It is considered that there is **insufficient information** to accurately predict the residual effects on these species in lieu of detailed mitigation proposals. A detailed assessment will be provided in the ES.

*Operational Phase Impacts*

9.8.193 During the operational phase of the Scheme, further impacts on these bird species are likely to be limited as displacement will have occurred at the construction phase. However, it is important to note that while nesting by skylark, lapwing and yellow wagtail stands to decline significantly within the Sites, the reversion of arable land to diverse, low-input grassland which is managed relatively infrequently, is likely to increase the abundance of invertebrate prey items for skylark and yellow wagtail markedly. A mosaic of grassland management would be specified in the LEMP and employed for maximum benefit. Skylark and yellow wagtail regularly forage tens or hundreds of metres away from nesting sites and both have been recorded foraging on active solar arrays. Lapwing are less likely to enter the solar arrays for foraging as they are more reliant on short-sward vegetation and damp ground in open environments within which to probe for food items. Therefore, displacement effects are expected to be counteracted to an extent by the increased foraging potential of the operational array Sites. This will be quantified in the ES.

9.8.194 Corn bunting, grey partridge and quail are likely to benefit from the creation of wider field margins through the imposition of buffer zones free of development which are anticipated to be significantly wider than at present. These buffer zones will be subject to various management regimes to provide a range of food resources and shelter areas. This will substantially increase both the suitability and abundance of habitat for foraging and nesting by these birds and offset the probable reduced availability of low-productivity foraging habitat within the arrays.

9.8.195 For all species, enhanced foraging opportunities are expected to provide a **significant beneficial effect** at least at the **Site** level. Over time, once new habitats have established, the magnitude of beneficial effects associated with increased foraging opportunities will be increased and may rise to a **Local** or **District** level.

*Operational Phase Additional Mitigation Measures and Residual Effects*

9.8.196 Grassland cuts will be timed sensitively to ensure that forage is available to ground-nesting birds across the breeding season. This shall be detailed in the LEMP.

9.8.197 It is currently considered that there is **insufficient information** at this stage to predict the residual effects on skylark, yellow wagtail and lapwing as mitigation measures have not been fully designed, although a substantial reduction in the severity and significance of adverse effects is anticipated, especially once new habitats establish and provide improved foraging resources.

9.8.198 Similarly, it is considered that there is **insufficient information** at this stage to foresee the residual effects on corn bunting, grey partridge and quail, although it is predicted that nesting will continue to occur within the Site. Moreover, the enhanced boundary habitats (with a greater abundance of weedy, seed-bearing vegetation), together with the presence of permanent short grassland within the mosaic of habitat management under the array, will reduce displacement of these birds.

**Breeding Birds – Other Species**

*Construction Phase Impacts*

9.8.199 All birds, their nests, eggs and young, are protected from damage/ killing/ injury. Numerous species were recorded by the surveys which nest within the boundary habitats in and around the Sites and as such are capable of being harmed by certain habitat clearance activities, either to facilitate access onto the array Sites or cabling works. Key species of conservation concern which may be impacted include: bullfinch, dunnock, greenfinch, linnet, reed bunting, song thrush, woodpigeon, wren and yellowhammer.

9.8.200 Additional species are protected from disturbance when nesting under Schedule 1 of the Wildlife & Countryside Act. Such species recorded by the surveys which may nest in woodland, ponds or buildings in and around the Site include: barn owl, Cetti's warbler, hobby, kingfisher, osprey, peregrine and red kite.

9.8.201 Accidental damage to nesting habitat, or degradation through pollution events would be avoided through the adoption of protective buffer zones from the onset of construction. The CEMP will detail measures to be taken to ensure that Schedule 1 bird species are not disturbed while nesting and that any other bird nests are not harmed. This will involve sensitive timing of works in proximity to known or likely nesting sites (including minor hedgerow removal for access or cabling), pre-commencement and regular monitoring by an Ecological Clerk of Works, briefing talks to all construction staff and the enhanced buffering from development of certain buildings or trees confirmed or likely to contain nesting sites. Given these measures, the risk of impacts to breeding birds, other than ground-nesting species, is very low. Any construction-phase impacts would be expected to be temporary and felt at a site level. Likewise, any effects would be **temporary and non-significant**.

9.8.202 Minor losses of hedgerow habitat at the array sites are not considered to cause a cumulative impact on the birds which use them as losses are limited to 3-6m lengths and represent a fraction of the total hedgerow network available. As a result, **no significant effects** associated with the loss of hedgerow habitat are anticipated.

9.8.203 Please refer to **Volume 3**, **Appendix 9.11** for additional confidential information regarding Schedule 1 species.

9.8.204 Where grasshopper warbler, a red-listed Species of Principal Importance, was recorded in coarse grassland at Green Hill C, this field has been retained outside the development area.

9.8.205 The LEMP will also detail the various habitat creation and management prescriptions to be applied as a mosaic within the buffer zones and panelled areas. The reversion of the arable land to a patchwork of grassland types, and the widening of uncultivated margins, will increase the availability of seed and invertebrate food for a wide variety of bird species.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.206 Please refer to **Volume 3**, **Appendix 9.11** for additional confidential information regarding Schedule 1 species.

*Operational Phase Impacts*

9.8.207 Owing to the use of development free buffer zones from the onset of construction, it is considered unlikely that the habitats within which these birds nest will be degraded through the presence of the adjacent arrays. Similarly, the temporary nature of the cabling work means that once cabling is complete, no impacts are anticipated.

9.8.208 Habitat management works and maintenance activities will be timed sensitively, as detailed in the LEMP, to avoid impacts on nesting birds and to ensure foraging resources are available across the breeding season.

9.8.209 The LEMP will contain details of the extensive additional planting of new hedgerows, trees and other woody vegetation across the Site boundaries as part of Biodiversity Net Gain proposals, which will increase nesting and foraging opportunities for numerous bird species.

9.8.210 With the creation of a wide range of habitats which will offer nesting and foraging opportunities across the Sites, a net gain in nesting and foraging habitat will be achieved. Across the Sites, this could lead to a residual **significant beneficial effect** at a **Local** level.

*Enhancement Measures*

9.8.211 The addition of bespoke features which provide nesting opportunities for various bird species, including for barn owl and kestrel, will feature within the LEMP and make use of trees, on-Site structures and adjacent buildings.

**Overwintering Birds**

*Construction Phase Impacts*

9.8.212 It should be highlighted that impacts on overwintering birds associated with the Upper Nene Valley Gravel Pits SPA, including golden plover and lapwing, are discussed in 9.8.6 above and not detailed here, to avoid repetition.

9.8.213 The potential for, and severity of, impacts on overwintering birds depends on the timing of construction activities. It is assumed that, with a c.18 month build programme, working over the winter months will be unavoidable. Consequently, there remains the risk that flocks of wildfowl, thrushes, larks, finches and wading birds will be dissuaded from areas of the Site or Cable Corridor which they might ordinarily use on an occasional basis for foraging and shelter. However, associated impacts will not be felt across the whole Scheme for the whole build programme, as arrays in some fields will be fully built out before progressing to other fields.

9.8.214 The onset of construction or cable installation activities within a given field, or the movement of vehicles or personnel into undeveloped fields, risks the disturbance and flushing of birds at a time of year where they are most susceptible to energetic stress. However, the Site was not seen to regularly support such flocks but rather act as an ‘option’ within a large network of similar habitat in the landscape. As such, any impacts would be expected to result in **significant adverse effects** at the **Site** level only.

9.8.215 There will be a temporary loss of foraging areas for overwintering birds within the local landscape whilst construction is ongoing. However, this impact will not be felt across the whole Scheme for the whole build programme, as arrays in some fields will be fully built out before progressing to other fields. As such, these fields may be usable by overwintering birds for some or all of the winter periods during the construction phase (subject to commencement timings). Moreover, there is a considerable extent of similar open habitat in the vicinity, and the habitats on Site were generally not seen to be of elevated importance compared to their surroundings. Where notable flocks of wintering birds were observed, key fields have been removed from the development area of the Scheme. As such, alternative foraging opportunities exist for birds in the local landscape and any temporary loss of foraging areas is considered to result in a **non-significant effect.**

*Additional Construction Phase Mitigation Measures and Residual Effects*

9.8.216 The CEMP will detail how work during the winter months will seek to minimise potential impacts on flocks of overwintering birds. This will involve the construction (including cabling) site management following a regime where undeveloped fields are not entered by plant or personnel unless it can be confirmed that they do not contain flocks of waders or wildfowl such as geese or plovers, so as to avoid unnecessary energy expenditure at a sensitive time of year. As such, any impacts will be avoided and such effects are deemed **non-significant**.

*Operational Phase Impacts*

9.8.217 It should be highlighted that impacts on overwintering birds associated with the Upper Nene Valley Gravel Pits SPA, including golden plover and lapwing, are discussed in 9.8.6 above and not repeated here, to avoid repetition.

9.8.218 For certain species, such as geese and waders, the presence and operation of the arrays will result in their permanent displacement from these fields (for the lifetime of the Scheme), as they require open fields to be vigilant of predators and to have space to take off. The field to the west of Green Hill E which supported a large, mixed flock of geese, has been retained outside the development area. Likewise, a portion of the fields supporting elevated numbers of waders have been retained. Therefore, this displacement effect is minimal and this impact is likely to result in a **significant adverse effect** at the **Site** level only.

9.8.219 Most overwintering birds, such as thrushes, finches and larks, would be expected to continue to forage within the operational Site. Disturbance to these species during the winter months would also be minimal, as grassland management activities are not needed outside the growing season. Substantial new habitat creation, including diverse grassland and buffer zones, will improve foraging resources relative to baseline levels for these species. Alongside this, management measures enshrined in the LEMP will seek to ensure the provision of foraging resources, including seed, fruits and berries, throughout the winter months, through sensitive methodologies and timing of works for grassland and hedgerow/ scrub management activities. With these measures, a **significant beneficial effect** would be expected at a **Local** level on the majority of overwintering birds.

*Additional Operational Phase Mitigation Measures and Residual Effects*

9.8.220 There will be an allocation of land outside the Scheme to mitigate impacts on ground-nesting breeding birds. Given the similar requirements for breeding skylark and those overwintering birds most likely to be permanently displaced from the Sites (large fields with open sightlines and either grassland or cereal crops), these fields will be available for use by said species during the winter for the lifetime of the Scheme. With the provision of off-site mitigation land for breeding birds (which will be available for use by overwintering birds for the lifetime of the Scheme), any potential adverse effects associated with displacement of overwintering birds are likely to be reduced to **neutral and non-significant** levels.

*Enhancement Measures*

9.8.221 The diverse habitat creation measures proposed as part of the Scheme, including grassland, hedgerow and scrub creation, along with sensitive management regimes, will provide enhanced foraging opportunities for overwintering birds.

**Invertebrates**

*Construction Phase Impacts*

9.8.222 With regard to terrestrial invertebrates, the hedgerows, mature trees, woodland edges, other neutral grassland fields and uncultivated field margins were relatively higher in value to invertebrates than the cultivated arable land. However, the presence of a notable assemblage of invertebrates is considered unlikely as these habitats are either limited in extent or subject to degradation from agricultural activities, such as dust deposition/ runoff and spray drift from herbicide and pesticide applications. This is likely to also be the case within the Cable Corridor, pending further survey.

9.8.223 Cable route laying may impact a small number of very short individual sections of hedgerow and field boundary habitats temporarily, before being reinstated. Where non-arable vegetation is removed from the Site, there is a minor risk for adverse impacts on the assemblage of invertebrate species associated with these plants, although the suitability of habitat for invertebrates is generally low or of little conservation significance. As a result, **no significant adverse effects** on terrestrial invertebrates during the construction phase are currently anticipated.

9.8.224 The nature of the proposals is such that edge habitats including hedgerows and woodland edges, will be retained by and large in their entirety, with array development activities taking place within the fields. Furthermore, diverse grassland fields will mostly remain undeveloped, whilst suitable buffers will be implemented around in-field trees and ponds. As a result, **no significant adverse effects** on terrestrial invertebrates associated with habitat loss are anticipated.

9.8.225 Construction activities may result in dust/sediment deposition, leading to degradation of the varied habitats at the field boundaries, including woodland edge, hedgerows, and ditches/watercourses, which were considered to the most value habitats for invertebrates. Effects of this are only likely to be temporary and are likely to be of a similar scale as current agricultural activities. Impacts could be felt in the long term if aquatic habitats are seriously affected. However, the imposition of fenced buffer habitats during construction (and beyond) will minimise the potential for these harms. Additionally, the CEMP will set out measures to minimise the risk of pollution, run-off and dust deposition impacts on the Sites' boundary habitats during construction. Given the above embedded mitigation measures, it is considered that any significant habitat degradation can be avoided.

9.8.226 For aquatic invertebrates (including white clawed crayfish, if present), the ditches, watercourses and ponds offer breeding, sheltering and foraging opportunities. The stream running approximately north-south along the eastern edge of Green Hill BESS is likely to have elevated quality for aquatic invertebrates relative to the other streams, ponds and ditches within the Sites, although the presence of a particularly notable assemblage is considered unlikely. This is likely to also be the case within the Cable Corridor, pending further survey. Fieldwork to be conducted for the Cable Corridor will take account of the relative habitat suitability for invertebrates, especially at field boundaries and watercourse crossing points. This will enable key areas of elevated suitability, which will require further assessment, mitigation or compensation, to be identified in advance of any cabling activities.

9.8.227 Additionally, once the location of watercourse crossing points is known, an assessment of the suitability of the habitats present for white clawed crayfish will be conducted at them, and, if required, a manual survey to establish their presence/likely absence will be completed.

9.8.228 Depending on the construction methodology associated with the laying of cables at watercourse crossing points, there is potential for adverse impacts on aquatic invertebrates to arise during the construction phase. The use of more invasive methods, such as open-cut trenching, may result in damage to banks of watercourses, the deposition of silts, and a reduction in the suitability of the watercourse for aquatic invertebrates. Given that the extent and scope of watercourse crossing points along the Cable Corridor (as well as the construction methodology to be used at these crossing points) has not been confirmed, **insufficient information** is currently available to conduct a preliminary assessment of effects on aquatic invertebrates. However, through the habitat protection measures in the CEMP, the consideration of different cable installation methodologies at watercourse crossing points and appropriate habitat investigation and reinstatement measures, all efforts will be made to avoid adverse effects on aquatic invertebrates during construction.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.229 Should the presence of white clawed crayfish be confirmed, avoidance/mitigation measures will be implemented. These measures may include the relocation of the cable route to avoid areas of suitable habitat, the use of HDD to avoid impacts on the watercourse itself, or obtaining a mitigation licence to mitigate for unavoidable impacts.

9.8.230 Where a notable assemblage of aquatic invertebrates or presence of particularly notable species, such as white clawed crayfish, are deemed to be present or potentially present within Cable

Corridor working areas/watercourse crossing points, HDD is proposed as the cable installation method. The CEMP will provide precautionary working methods surrounding the installation of the cables and the minimisation of risks associated with HDD. This would include visual monitoring for discharge of sediments, monitoring for vibrations, suitable depth settings and precautionary siting of entry and exit pits. Following the implementation of these measures, it is anticipated that any potential effects arising from the use of HDD on aquatic invertebrates could be reduced **to neutral, non-significant levels**.

*Operational Phase Impacts*

9.8.231 The cessation of intensive arable farming practices (particularly insecticide spraying) and reversion of the land to permanent grassland (for at least the duration of the Scheme) can be expected to result in increased diversity and abundance of both terrestrial and aquatic invertebrates at the operational Site. This includes a number of pollinating of butterfly and bee species which have been shown to have increased diversity and abundance in solar arrays compared to control plots. For aquatic species, the reduced input of dust, soil and chemicals into boundary ditches and streams is likely to improve these habitat's quality and thereby the invertebrate assemblage.

9.8.232 Moreover, the creation of diverse habitats within buffer zones and sensitive management of both retained and new habitats, as detailed in the LEMP, will result in a greater extent of higher-value habitat for terrestrial invertebrates. Given the large extent of habitat that will likely increase in quality, the operational impacts of the development will have beneficial effects on a range of invertebrates. This effect may be expected to be a **significant beneficial effect at a Site level**.

9.8.233 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially lead to the killing of aquatic invertebrates, which could have a short-medium-term significant adverse effect. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the Hydrology and Drainage chapter, and the Ground Conditions and Contamination chapter. When considering the above embedded mitigation measures, **no significant adverse impacts** on invertebrates are anticipated to arise during the operational phase.

*Enhancement Measures*

9.8.234 Opportunities to enhance the biodiversity value of the habitats around the Site will be explored, in collaboration with local conservation organisations, to target local conservation priority species, including black hairstreak and lime bark beetle. This will include the sowing of seed mixes and planting of tree groups containing particular species, as well as management options of benefit to invertebrates within the grassland habitats beneath the arrays, marginal habitats, ponds and watercourses. These measures will be developed in the finalisation of the LEMP.

9.8.235 Bespoke features such as dead-wood piles and beetle banks will be installed to provide additional shelter, foraging and breeding opportunities for invertebrates.

**Plants (including Arable Weeds)**

*Construction Phase Impacts*

9.8.236 Surveys have revealed the presence of several notable plants within the Sites; chiefly arable weeds. The arable weed assemblages recorded within the Scheme were of no higher than Local importance. In the absence of additional mitigation, these species would likely be permanently (for the duration of the Scheme) lost from the Sites through the construction of the arrays and seeding of grassland in place of arable habitats, although some species may persist. This would likely constitute a **significant adverse effect** at the **Local** level.

9.8.237 Where other individual notable plant species may be present, such as in hedgerows, woodland and grassland, these habitats will be retained and protected with undeveloped buffer zones. Any minor losses of hedgerow for access will constitute a tiny portion of the hedgerow network and the likelihood of impacts to notable plant species is very low and **not significant**.

9.8.238 The habitats within the Cable Route Search Area are assumed to be similar to those within the Sites, and therefore there is the potential for some notable plant species to be present, such as in arable field margins or species-rich grasslands. The siting of the Cable Corridor will take into account the presence of any habitats which are likely to contain notable plant species or communities. Where these habitats are identified, all efforts will be taken to avoid/minimise impacts on these habitats/communities, through measures such as the relocation of the cable route, or the construction methodology used in a particular area (for example HDD over open cut trenching methods). The land within the Cable Corridor affected during the construction phase will also be reinstated upon completion of the works. With the above embedded mitigation measures, it is considered that effects potentially arising from this impact pathway can be reduced to **neutral, non-significant levels**.

*Construction Phase Additional Mitigation Measures and Residual Effects*

9.8.239 Mitigation options for arable weeds within the operational phase of the Scheme are currently being explored, and may include the provision of margins or areas of set-aside which are annually cultivated to facilitate the ongoing presence of arable weeds within the Scheme boundary. As such, **insufficient information** is currently available to make an accurate preliminary assessment on the potential residual effects on arable weed communities, and a final assessment will be made within the ES, once all mitigation measures have been considered and implemented within the Scheme design where possible.

*Operational Phase Impacts*

9.8.240 The routine operation of the Scheme will not entail any significant harmful activities to notable plants. Management activities, such as grass and hedgerow cutting, will be timed sensitively to ensure that plants can flower and set seed, as specified in the LEMP.

9.8.241 The seed mixes for the various grassland areas, including the main array areas, margins and wetland areas, are likely to contain several of the notable species identified by the desk study, such as field scabious and ragged robin. Additionally, the cessation of intensive arable farming practices (particularly herbicide spraying) and reversion of the land to permanent grassland (for at least the duration of the Scheme) can be expected to result in increased diversity of plants and may facilitate the establishment of a number of notable species.

9.8.242 **No significant adverse effects** on plants are anticipated during operation of the Scheme. It is possible that with the establishment of new habitats, the incidence of notable plant species across the Sites will increase. This may lead to a **significant residual beneficial effect** at the **Local level**.

*Enhancement Measures*

9.8.243 The creation of new habitats will include local priority species, such as black poplar within hedgerows, tree lines, shelter belts, as appropriate.

**Fish**

*Construction Phase Impacts*

9.8.244 Several ditches and streams lie at the boundaries of the Sites. Additionally, the Sites and Cable Route Search Area lie within the catchment for two major rivers; principally the River Nene and also the Upper and Bedford Ouse (Green Hill G only) and contain drains or streams which flow downstream into these catchment zones. No notable fish records were gathered by the data search within the Sites or 2km search area.

9.8.245 Within the array Sites, potential impacts on fish species are considered only possible from pollution events during construction, although it is considered that these would have to be of a high severity or duration to cause significant impacts. This is thought unlikely due to the wide

buffer zones to be implemented around all ditches and watercourses on Site, although possible where ditch/boundary feature crossings are proposed.

9.8.246 In addition to the various boundary buffer zones, the CEMP will contain a raft of measures to be followed during construction which will limit the potential for pollution events and the release of sediments and run-off into watercourses. This will include ecological supervision and inspection prior to and during works affecting watercourses, such as installation of ditch crossings for access, and precautions concerning vehicle/plant refuelling, sediment trapping and storage of materials.

9.8.247 The cable installation process which will be required to cross underneath the River Nene will likely utilise HDD methods. While this is far preferable to any cable installation which might involve any direct harm to the riverbeds themselves, a small risk remains of vibrations leading to sediment mobilisation, or the emission of pollutants. The CEMP will also provide precautionary working methods surrounding the installation of the cables and the minimisation of risks associated with horizontal directional drilling. This would include visual monitoring for discharge of sediments, monitoring for vibrations, suitable depth settings and precautionary siting of entry and exit pits.

9.8.248 Given that the extent and scope of watercourse crossing points along the Cable Corridor (as well as the construction methodology to be used at these crossing points) has not been confirmed, **insufficient information** is currently available to conduct a preliminary assessment of effects on fish. However, through the habitat protection measures in the CEMP, the consideration of different cable installation methodologies at watercourse crossing points and appropriate habitat investigation and reinstatement measures, all efforts will be made to avoid adverse effects on fish during construction.

*Operational Phase Impacts*

9.8.249 As the nature of the proposals are relatively passive, with movement of vehicles and personnel close to ditches and watercourses being restricted, the opportunity for impacts from pollution or run-off is highly limited. Indeed, levels of run-off would be expected to decrease compared to the current arable regime. Similarly, the cessation of pesticide and fertiliser use would be expected to lead to an increase in water quality in watercourses within/adjacent to the Site. The overall reduction in sediment and chemical run-off across the Scheme is likely to lead to a **significant beneficial effect** at the **Local level**.

9.8.250 At Green Hill BESS, there is a potential risk of a battery fire and subsequent discharge of chemicals into the adjacent stream, which feeds into the River Nene. This could potentially kill or injure fish associated with the affected watercourses or those downstream. Ecological buffers have been embedded into the design of the Scheme from an early stage, in order to minimise the likelihood of adverse impacts arising during the operational phase. Additionally, embedded mitigation measures to minimise the likelihood and severity of battery fire have been incorporated into the Scheme. The risk of a fire will be moderated through a fire risk management plan, and measures to mitigate impacts in the event of a fire will be detailed within an Outline Battery Safety Management Plan and the OEMP. These are discussed in more detail in the Hydrology and Drainage chapter, and the Ground Conditions and Contamination chapter. Given these embedded mitigation measures, **no significant effects** would be expected in the event of a BESS fire.

9.8.251 The potential for effects of anthropogenic EMFs on ecology is an emerging and poorly researched issue. It is feasible that EMFs emanating from electrical cables could impact fish species which utilise naturally generated EMFs for navigation, although to date there is very little evidence of significant behavioural changes from EMFs generated by electric cables. The size of generated fields is highly contingent on geometry, voltage and current, and it is considered that EMFs associated with the higher voltage export cable are more likely to risk impacts than those potentially emanating from interconnecting cables across the Scheme. All electrical cables associated within the Scheme are expected to be buried underground; buried cables typically have their electric fields fully attenuated by cable sheathing and the substrate under which they are buried. However, magnetic fields and induced electric fields are not attenuated in this way, and there lies a risk of effects on fish species which are known to have evolved sensitivity to

electric and/or magnetic fields. There is some risk of EMFs affecting fish in the vicinity of the 400-132kV cables (i.e. where the cable is required to cross beneath watercourses).

9.8.252 Given that the extent and scope of watercourse crossing points along the Cable Corridor has not been confirmed, **insufficient information** is currently available to conduct a preliminary assessment of effects of EMFs on fish. The potential effects from this impact pathway will be assessed within the ES, particularly while the relationship between EMFs and aquatic wildlife remains poorly understood.

**Invasive and Non-Native Species**

*Construction Phase Impacts*

9.8.253 Although no invasive non-native plant species have been observed to date, if present they are considered most likely to occur at field boundaries and in habitats associated with watercourses. Such species may be caused to spread through works associated with ditches and crossing thereof, or during any necessary works to clear habitats prior to construction commencing.

9.8.254 The CEMP will describe precautionary measures to be taken to avoid the accidental spread of these species. This includes a briefing for all construction staff on the issue to ensure vigilance for these species, as well as inspections of proposed working locations at watercourses and ditches by an ecologist prior to commencement.

9.8.255 Both mink and American signal crayfish have been observed within the Sites. Neither mink nor American signal crayfish are likely to be impacted during construction; this would only occur in the event of crossing of watercourses disturbing these species. Given the limited extent and temporary nature of works associated with watercourse crossings, these species would not be spread as a direct result of these works (which would otherwise result in an offence).

9.8.256 Muntjac and Chinese water deer have also been recorded within the Sites. These species are likely to roam widely in the local landscape and, though they will be displaced from the Sites temporarily during construction, they are already established within the county and would not be likely to spread beyond their current range as a result of the Scheme.

9.8.257 The fieldwork proposed for the Cable Corridor will pay attention to the presence of non-native invasive species and record these where found.

9.8.258 It is considered that the continued and specific monitoring for invasive non-native species as set out in the CEMP will reduce potential residual effects on this issue to neutral levels, especially considering their absence in the baseline information to date. **No adverse effects** relating to invasive/ non-native species are anticipated during the construction phase.

*Operational Phase Impacts*

9.8.259 Impacts to mink, American signal crayfish, Muntjac and Chinese water deer will remain the same as baseline; these species would be expected to use the operational Site.

9.8.260 Should any invasive/ non-native plant species be present, **no significant operational phase effects** are considered likely, due to the buffering of peripheral habitats included within the Scheme and lack of habitat disturbance following the establishment of the habitats targeted in the LEMP.

*Enhancement Measures*

9.8.261 Targeted INNS programmes have the potential to contribute towards controlling the presence of American mink and American signal crayfish, which would prevent further expansion of their populations, supporting recovery of water vole populations and fish assemblages assumed present within watercourses. Where pursued, these efforts could be coordinated with nearby conservation groups, such as local Wildlife Trusts, Sywell Reservoir or Pitsford Reservoir.

## 9.9 Cumulative Effects

### Cumulative Effects

9.9.1 The ES will give consideration to potential cumulative effects of the Scheme and other relevant projects within the vicinity of the Scheme on a single ecological receptor. Relevant projects will comprise in-construction, consented or emerging proposals of sufficient size, scale and development nature to cause or increase effects upon IEFs in combination with the Scheme.

9.9.2 The ZOI for cumulative effects on ecological receptors is likely to be more restricted to projects within the local landscape (likely up to 10km from the Scheme boundary), although the ZOI for cumulative effects may vary between receptors. An appropriate ZOI for each ecological feature will be established, based on factors such as how mobile a particular species is, the habitat preferences of a particular species, as well as the rarity of the species/feature in the context of the local landscape.

9.9.3 Cumulative effects may be additive or synergistic and result from individually non-significant but collectively significant impacts. Implications for further mitigation or compensation will be considered, as well as changes to any likely residual effects.

9.9.4 A list of cumulative projects can be found in **Volume 3**, **Appendix 2.2** of the PEIR; the list will be reviewed and refined in preparation of the DCO application submission through further consultation and will be presented and assessed in the ES. Cumulative effects will be listed within **Chapter 25: Cumulative Effects** of the ES.

9.9.5 The cumulative effects on Ecology and Biodiversity generated from the Scheme will be fully assessed in the ES and are likely to consist of (but not limited to):

- Loss of Functionally Linked Land (FLL) within the 10km consultation zone of the Upper Nene Valley Gravel Pits Special Protection Area (SPA);
- Habitat loss for ground-nesting birds;
- Loss of arable weeds;
- Removal of hedgerows and fragmentation of the local hedgerow network; and
- Reversion of arable land to more ecologically valuable habitats, such as permanent grassland and woodland.

### In Combination Effects

9.9.6 The ES Chapters will consider the effects that result from the combination or interaction of different impacts on an individual ecological receptor, where multiple impacts may result in a combined effect which is more significant than each individual effect in isolation.

9.9.7 The following sources of potential in-combination impacts will be considered in the assessment:

- The combination of individual effects on a particular ecological receptor, for example, the combined effects of habitat loss, construction related noise and habitat degradation on a particular species;
- The combination of different works of the Scheme on a particular receptor, for example, the in-combination effects of the construction of the cable route and the solar arrays at the same time; and
- Mitigation measures required by other environmental disciplines to address non-ecological environmental impacts, which may result in direct/indirect impacts to ecological receptors.

9.9.8 The Preliminary Assessments of Effects detailed in Section 9.8 already account for a number of impacts on ecological receptors arising from the various aspects of the Scheme, including noise, lighting, air quality, habitat loss and fragmentation, and the risk of battery fires. The likelihood for these individual effects to result in a more significant in-combination effect will be reported in the ES chapter, following the completion of the individual environmental topic assessments.

## 9.10 Summary

9.10.1 This chapter of the PEIR has identified the existing environment in relation to Ecology and Biodiversity and the assessment work that has been undertaken to date.

9.10.2 Preliminary mitigation measures to address the potential impacts identified have been described, with an assessment of potential residual effects outlined where this is possible. However, it is to be noted that it is not currently possible to identify all significant likely environmental effects of the Scheme, given that baseline ecological surveys are still ongoing at the time of writing, and the design of the Scheme is still in progress. It is considered that insufficient information is currently held for the below receptors in order to make an accurate preliminary assessment:

- Upper Nene Valley Gravel Pits SPA, SSSI and Ramsar;
- Local Statutory and Non-Statutory Designated Sites within Scheme/Cable Route Search Area;
- Ditches and Watercourses;
- Roosting Bats;
- Breeding Birds – Ground Nesting Birds of Open Habitats;
- Invertebrates;
- Plants (including Arable Weeds); and
- Fish.

9.10.3 At this stage, residual beneficial effects (after all mitigation has been considered) as a result of the Scheme are anticipated for the following receptors:

- Grassland (including Arable Field Margins and Other Neutral Grassland);
- Ponds;
- Hedgerows and Lines of Trees;
- Ditches and Watercourses;
- Badgers;
- Foraging/ Commuting Bats;
- Brown Hare;
- Harvest Mouse, Hedgehog and Polecat;
- Amphibians (including Great Crested Newt);
- Reptiles;
- Breeding Birds – Other Species; and
- Overwintering Birds.

9.10.4 At this stage, it is considered that any potentially significant adverse effects on the identified ecological receptors can be avoided, mitigated or compensated for, and therefore no significant residual adverse effects (after all mitigation has been considered) have currently been identified. However, baseline survey work is still being undertaken, and the fact that Scheme design is still underway means that it is currently not possible to undertake a full assessment of potential impacts, such as habitat loss and fragmentation.

9.10.5 As insufficient information is currently held for a number of receptors in order to make an accurate preliminary assessment, significant adverse residual effects on a small number of ecological receptors cannot currently be ruled out.

9.10.6 A full assessment of impact for all ecological receptors will be possible following the completion of all baseline survey work, and the finalisation of the Scheme design. These assessments will be provided within the ES Chapter when this is produced.

9.10.7 **Table 9.15** below provides a summary of residual effects at the PEIR stage.

**Table 9.15: Summary of Residual Effects**

| Ecological Feature | Residual Effect (After all Mitigation) | | Significance Scale of Residual Effect | |
|---|---|---|---|---|
| | Construction | Operation | Construction | Operation |
| **Designated Sites** | | | | |
| Upper Nene Valley Gravel Pits SPA, SSSI and Ramsar | Insufficient Information | | | |
| National Statutory Designated Sites within 300m of Scheme | Neutral | Neutral | Not Significant | Not Significant |
| National Statutory Designated Sites within 5km of Scheme | Neutral | Neutral | Not Significant | Not Significant |
| Local Statutory and Non-Statutory Designated Sites within Scheme/Cable Route Search Area | Insufficient Information | Neutral | Insufficient Information | Not Significant |
| Local Statutory and Non-Statutory Designated Sites within 300m of Scheme | Neutral | Neutral | Not Significant | Not Significant |
| Local Statutory and Non-Statutory Designated Sites within 2km of Scheme | Neutral | Neutral | Not Significant | Not Significant |
| **Habitats** | | | | |
| Grassland (including Arable Field Margins and Other Neutral Grassland) | Neutral | Beneficial | Not Significant | District |
| Woodland | Neutral | Beneficial | Not Significant | Local |
| Rural Trees, and Ancient/Veteran Trees | Please refer to Chapter 19: Arboriculture | | | |
| Ponds | Neutral | Beneficial | Not Significant | Local - District |
| Hedgerows and Lines of Trees | Neutral | Beneficial | Not Significant | Local |
| Ditches and Watercourses | Insufficient Information | Beneficial | Insufficient Information | Local - District |
| **Species** | | | | |
| Badgers | Neutral | Beneficial | Not Significant | Site |
| Roosting Bats | Insufficient Information | Neutral | Insufficient Information | Not Significant |
| Foraging/Commuting Bats | Neutral | Beneficial | Not Significant | Local |
| Otters and Water Voles | Neutral | Neutral | Not Significant | Not Significant |
| Brown Hare | Neutral | Beneficial | Not Significant | Local |

| Ecological Feature | Residual Effect (After all Mitigation) | | Significance Scale of Residual Effect | |
|---|---|---|---|---|
| | Construction | Operation | Construction | Operation |
| Harvest Mouse, Hedgehog and Polecat | Neutral | Beneficial | Not Significant | Local |
| Amphibians (including Great Crested Newt) | Neutral | Beneficial | Not Significant | Local - District |
| Reptiles | Neutral | Beneficial | Not Significant | Local |
| Breeding Birds – Ground Nesting Birds of Open Habitats – Skylark, Yellow Wagtail and Lapwing | Insufficient Information | | | |
| Breeding Birds – Ground Nesting Birds of Open Habitats – Corn Bunting, Grey Partridge and Quail | Insufficient Information | | | |
| Breeding Birds – Other Species | Neutral | Beneficial | Not Significant | Local |
| Overwintering Birds | Neutral | Beneficial | Not Significant | Local |
| Invertebrates | Insufficient Information | Beneficial | Insufficient Information | Site |
| Plants (including Arable Weeds) | Insufficient Information | Beneficial | Insufficient Information | Local |
| Fish | Insufficient Information | Insufficient Information | Insufficient Information | Insufficient Information |
| Invasive and Non-Native Species | Neutral | Neutral | Not Significant | Not Significant |

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