

# WESTHIDE SOLAR

## Ecological Appraisal

for

Ersun (Westhide SPV) Ltd

December 2021

THE **Landmark**  
PRACTICE

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*The information which we have prepared and provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.*

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## EXECUTIVE SUMMARY

The Landmark Practice was commissioned by Ersun (Westhide SPV) Ltd in October 2020, to prepare an Ecological Appraisal to inform the submission of a planning application for Solar Park at Land at Westhide, Herefordshire. This report describes ecological survey work undertaken, considers the impacts of the proposed development on the ecology of the site and environs and describes suitable avoidance, mitigation and enhancement measures to address predicted impacts.

A desk study was undertaken to find details of designated sites and legally protected and notable species records within the zone of influence of the site. A Phase 1 habitat survey and protected species assessment was conducted of the application site in October 2020 to map the habitats present and highlight potential for protected species to occur. A further Phase 1 survey was undertaken in June 2021 of an access track route to the north to be utilised by construction traffic. This Ecological Appraisal Report assesses the potential impacts of a solar development at this site on biodiversity.

The site comprises a network of eight arable fields bounded by hedgerows and woodland. Several scattered mature trees are present within the fields, as well as three ponds. The construction access track leads across the edge of an arable field and across two semi-improved grassland fields, joining an existing access point in a strip of woodland to the north of the site.

A suite of further ecological surveys were undertaken, in accordance with industry guidance, for species which could be affected by the proposed development, as follows:

- Badger monitoring surveys;
- Bat activity surveys;
- Breeding bird surveys;
- Wintering bird scoping surveys; and
- Great crested newt eDNA survey and population size-class assessments.

Bat activity across the site was moderate, with ten different species of bats being present. The majority of passes represented pipistrelle species, with much smaller number of passes made by Annex II species lesser horseshoe and barbastelle.

An assemblage of bird species typical of the arable landscape was identified during the breeding bird surveys with the site providing opportunities to a number of species of conservation concern including skylark, linnet dunnock, song thrush and yellowhammer.

A small population of great crested newts (GCN) was identified in Ponds 1, 2, 4 and 6, with ponds containing small (i.e., less than 10 individuals noted) peak counts of GCN.

No impacts on any other statutory or non-statutory designated sites from the proposed development are expected. Key Avoidance/Mitigation/Enhancement Measures outlined within this report are as follows:

- Creation of buffers between sensitive boundary habitats and development footprint;
- Creation of wildlife corridors within the site (buffer for all woodland, hedgerows and ponds);
- Creation of circa 48 ha of species rich grassland;

- Extensive enhancements to the landscape including 1.24 km of new hedgerow as well as 2.2 km of hedgerow enhancement and 190 new trees planted throughout the site;
- Adherence to Arboricultural Method Statement and Tree Protection Plan to prevent damage to boundary features and retained trees;
- Landscape planting proposals incorporate native species of local provenance with known wildlife benefit;
- Hedgerows to be managed to allow significant structure to develop benefiting foraging and commuting bats;
- Production of Landscape and Ecological Management Plan (LEMP) to ensure long-term safeguarding and management of new habitats;
- Production of Construction Environmental Management Plan (CEMP) to safeguard wildlife during construction;
- Pre-commencement badger survey;
- Pre-commencement bat tree roost assessments;
- No artificial lighting expected. Should it be required during construction, sensitive lighting only;
- Precautionary Working Method for Dormice, in order to create four no more than 2 m gaps in hedgerow for permissive pathways.
- Sensitively timed site clearance to protect any nesting birds;
- Provision of wild bird seed mix 0.5 ha in parts of the buffer areas (to be specified within LEMP);
- Incorporation of 10 no. bat and 10 no. bird boxes on retained trees throughout the site to increase roosting/nesting opportunities;
- Production of Non-Licensed Method Statement for GCN, including specific ecological enhancements including 25 m GCN buffer wildlife corridor;
- Provision of 5 no. reptile hibernacula; and
- Adherence to a Reptile Mitigation Strategy to prevent any reptile being killed or injured.
- Biodiversity Net Gain calculations using Defra metric 3.0;
- General good working practice should be adhered to.

Provided that the measures that are summarised above are fully applied, the proposed development is not considered to have the potential to result in any significant impacts on protected species, habitats or designated sites.

By virtue of the relatively limited ecological constraints posed by the site's habitats coupled with the scale of the proposals and mitigation measures, the scheme is capable of compliance with relevant planning policy and legislation for the conservation of the natural environment.

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**APPENDIX A: PROPOSED MASTER PLAN**

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## 1.0 INTRODUCTION

- 1.1 The Landmark Practice (TLP) is an award winning multi-disciplinary consultancy offering bespoke and integrated services in ecology, environmental planning, landscape architecture and architectural graphics. We are a CIEEM Registered Practice and are independent and respected, working on a large range of development projects for our clients throughout the UK. Full details of the practice can be found at <http://thelandmarkpractice.com/>.
- 1.2 In October 2020 TLP was commissioned by Ersun (Westhide SPV) Ltd to assess the potential ecological impacts associated with a proposed solar farm at Westhide, Hereford, Herefordshire, hereafter referred to as the 'site.'

### Site Location and Description

- 1.3 The site, which measures approximately 152 acres, is located 9 km north-east from Hereford (approximate central grid reference SO 577 443, **Figure 1** refers). The local planning authority (LPA) is Herefordshire County Council.
- 1.4 The habitats which comprise the site were for the most part typical of Herefordshire, comprising arable farmland. The site itself comprises a network of eight fields (approximately 152 acres in total), which are all arable with an extensive network of mature hedgerows with trees, with drainage ditches at their bases.
- 1.5 The arable fields comprised a mixture of amenity lawn turf and arable crops. Two areas of plantation woodland were present within the site (one of which was recently planted, whilst the other was considerably more mature). Several areas of semi-natural broadleaved woodland were also present within the site boundary, this included a thin strip along the northern boundary, a patch around a pond and section of woodland adjacent to field A. Scattered mature trees are also found within some of the fields.
- 1.6 The hedgerows which bound and bisect the site are a mixture between species-poor and species-rich in terms of species composition. Hedgerows are also for the most part intact, with few gaps and are of good quality in terms of size, structure and connectivity. Some hedgerows contained a scattering of mature trees. The northern boundary comprises a row of trees (which have probably developed from an un-managed hedgerow) which leads onto woodland a small strip of which is included within the site.

### Development Proposals

- 1.7 The proposed development will comprise a 34.6MW ground-mounted solar PV (photovoltaic) development.
- 1.8 The solar park will be set out as solar arrays, with sufficient space between the arrays to avoid one array of PV modules overshadowing the next.
- 1.9 It is expected that the PV modules will be mounted on metal frames on posts piled into the ground to a depth of up to 3 m (depending on ground conditions) using percussion piling into the ground causing minimal impact on the ground surface and will be fully removable on decommissioning. The highest point of the modules will be circa 3 m above ground.

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- 1.10 The solar park will also encompass central inverters and a Distribution Network Operator (DNO) substation.
- 1.11 The application site will be protected with a security fence of circa 2.5 m in height. The security fencing will not be dug into the ground but will be flush to the ground. The fencing will have small mammal gates installed. The application site will not be artificially lit.
- 1.12 A new access route is proposed for construction traffic only, to reduce the use of the road between Withington and Westhide during that period. The track leads from an existing agricultural facility to the north-west and runs across three fields to join an existing access point on the north of the site.
- 1.13 All existing boundary hedgerows and associated features will be retained. The external security fence will be offset internally from the perimeter hedgerows by at least 5 m. Once the solar park is established, the system will require minimal on-going maintenance. Experience has shown that PV modules are cleaned to a considerable degree by rainfall but will also be manually cleaned several times a year. Activity at the solar park will be limited to periodic repair and/or maintenance. Grassland will be managed over the likely 30-year life of the installation by a sensitive ecological management plan.

#### **Scope of Assessment**

- 1.14 This Ecological Appraisal sets out the findings of the desk based and field-based ecological assessment, undertaken by TLP during 2020 and 2021. The report considers the potential for ecological impacts to occur and outlines opportunities for avoidance, mitigation and enhancement measures based upon the development proposals in the context of relevant legislation and planning policy.
- 1.15 The aims of this report are to:
- Define the ecological baseline, identifying important ecological features that are of relevance to the proposals;
  - Detail avoidance, mitigation and compensation measures where necessary; and
  - Identify potential opportunities to enhance and add to the biodiversity resource within the application site and links to the surrounding landscape in line with local and national planning policy.

## **2.0 LEGAL AND PLANNING CONTEXT**

### **Legal Context**

- 2.1 A range of habitats and species that may actually or potentially be present at the site are afforded legal protection under domestic and European legislation (**Appendix B** refers).

### **Planning Policy Context**

- 2.2 National and Local Planning Policy has been considered within the assessment. The relevant Development Plan policies are reproduced in (**Appendix B**).

## **3.0 METHODS**

- 3.1 The method for carrying out this assessment follows standard guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2019). The assessment has been undertaken by appropriately qualified ecologists using recognised

best practice methodologies wherever possible and where these exist. Reasons for any deviation from best practice methodologies are provided below, but usually relate to timing of instruction, access restrictions and/or application of professional judgement, as appropriate.

### Desk Study

- 3.2 The desk study involved the collation and review of contextual information such as designated sites and past records of protected and priority species occurring within the potential zone of influence of the site.
- 3.3 The desk study involved collating information from the following sources:
- Herefordshire Biological Records Centre (HBRC);
  - Multi-Agency Geographic Information for the Countryside (MAGIC);
- 3.4 The desk study was undertaken during December 2020. See **Table 1** for a summary of the information obtained:

**Table 1:** Desk Study Data Sources

Data	Search area	Source	Justification of search area
<b>Species</b>			
Protected & notable species	2 km	1	The works footprint/zone of influence is minimal in relation to retained habitats within the immediate landscape.
Extended search for bats	4 km	1	
European protected species licence applications EPSL	4 km	2	
S41 species	1 km	2	
Non-native invasive species	1 km	1	
<b>Habitats</b>			
S41 Habitats	2 km	2	As above
Ancient woodland	2 km	2	
<b>Sites</b>			
Statutory protected sites – impact zones	Within the site	2	As above
Non-Statutory protected sites (e.g., LWS)	2 km	1	
National statutory protected sites	5 km	2	
International statutory protected sites	10 km	2	
<b>Notes</b>			
1= Herefordshire Biological Records Centre. Received 09/11/2020.			
2= MAGIC (Multi-Agency Geographic Information Centre website ( <a href="http://www.magic.gov.uk/">http://www.magic.gov.uk/</a> )). Accessed: 01/12/2020			

- 3.5 In light of the scope of the project, the above-mentioned search areas are considered sufficient to cover the potential zone of influence of the project in relation to designated sites, habitats and species. Geological designated sites have not been included as these



are not relevant to the ecological assessment. Biological records that are no more than 10 years old have been included.

- 3.6 A desk based scoping exercise was undertaken using Ordnance Survey (OS) maps and aerial photographs to highlight any ponds within 500 m of the site that could potentially support great crested newts (GCN) (*Triturus cristatus*). The 500 m search parameter is based on the 'Great Crested Newt Mitigation Guidelines' (English Nature, 2001), which advise that ponds up to 500 m away from a development site should be surveyed if it is considered likely that great crested newt populations centred on those ponds could be affected by changes to the site.

### **Preliminary Ecological Appraisal – Field Surveys**

#### Phase 1 Habitat Survey

- 3.7 The Phase 1 habitat survey (JNCC, 2010 & IEA, 1995) was conducted of the site on 30<sup>th</sup> October 2020 by two suitably experienced ecologist from TLP to assess the ecological value of the site and record habitats present. The survey covered the site and its immediate surroundings. Conditions during the survey were 100 % cloud cover, dry, 13°C, Wind 2-3 (Beaufort). A further Phase 1 habitat survey was carried out 17<sup>th</sup> June 2021 of the construction access track to the north of the site. Conditions during this survey were 100% cloud cover, dry, 19°C, Wind 0 (Beaufort). Another Phase 1 of areas of woodland included within the redline was undertaken on the 17<sup>th</sup> November 2021. Weather conditions were 0% cloud cover, 12°C, dry and wind 0-1 (Beaufort).
- 3.8 The Phase 1 habitat surveys followed standard methodology published by the Joint Nature Conservation Committee (2010). Each identifiable and definable land parcel was assigned a habitat (as defined by the JNCC). Dominant plant species present were recorded in accordance with plant species nomenclature in Stace (2010). This level of survey does not aim to compile a complete floral and faunal inventory for the application site.
- 3.9 The habitats recorded using the JNCC Phase 1 habitat descriptions were reviewed in relation to S41 Priority Habitats.

#### Protected Species Assessment

- 3.10 As part of the appraisal the site was assessed for its potential to contain protected or notable species. The assessment was based on the habitats present on site and their suitability for protected species. Further information on the legal protection of these species is presented in **Appendix B**. Protected species assessed for, but not limited to, were:

- Badger (*Meles meles*);
- Bats;
- Dormouse (*Muscardinus avellanarius*);
- Birds (nesting, wintering and arable);
- Otter (*Lutra lutra*);
- Water vole (*Arvicola amphibius*);
- Amphibians (inc. Great crested newt (*Triturus cristatus*));
- Reptiles;
- Invertebrates; and

- White clawed crayfish (*Austropotamobius pallipes*).

3.11 In addition, a search was made for evidence of non-native, invasive species.

#### Badger Survey

3.12 A badger survey was undertaken for the proposed scheme please refer to the **Confidential Badger Report (TLP, October 2021)**.

#### Bats Survey

##### *Bat Scoping Survey*

3.13 A preliminary bat roost assessment was conducted at the same time as the Phase 1 Habitat Survey by an experienced and bat licensed ecologist. The inspection entailed systematically surveying the barn on site, both externally and internally, looking for evidence of roosting bats and other protected species. As well as an inspection for live bats, other evidence searched for included droppings, urine stains and feeding remains. Potential access and egress points for bats were also noted as well as crevice roosting potential.

3.14 The barn was then placed in one of the following bat roost potential categories (**Table 2** refers), based on current best practice guidelines (Collins, 2016).

**Table 2:** Categorisation of Bat Roosting Potential of Buildings

Level of Bat Roosting Potential	Rationale
Confirmed Roost	Presence of bats or evidence of use by bats.
High	Building with features that are highly suitable for roosting bats and with good connectivity to quality foraging habitat, such as woodland or lakes. Building has no evidence of current use by bats.
Moderate	Building with features present that are suitable for roosting bats and with connectivity to foraging habitat. Building has no evidence of current use by bats.
Low	Building with a low number of roosting opportunities and with limited connectivity to foraging habitat. Building has no evidence of current use by bats.
Negligible	Building with no or very limited roosting opportunities for bats, no evidence of use of bats and where the structure is isolated from foraging habitat.

#### *Categorisation of Habitat suitability for Bats*

3.15 Following the Phase 1 habitat survey the habitat on site was categorised according to its likely value for bats (on a scale of negligible, low, moderate or high potential for commuting and foraging bats). The categories are based on the observations and information set out in **Table 3**, which is based on current best practice guidelines (Collins, 2016).

**Table 3:** Categorisation of Foraging Habitat

Suitability	Rationale
<b>Negligible</b>	Negligible habitat features on site likely to be used by commuting or foraging bats.
<b>Low</b>	Habitat that could be used by small numbers of commuting bats (such as a gappy hedgerow or un-vegetated stream), but isolated, i.e., not very well connected to the surrounding landscape by another habitat.  Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
<b>Moderate</b>	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.  Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
<b>High</b>	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river, valleys, streams, hedgerows, lines of trees and woodland edge.  High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland.  Site is close to and connected to known roosts.

*Ground Tree Roost Assessment*

- 3.16 Ground tree bat roost assessment was conducted concurrently with the Phase 1 Habitat surveys, by an experienced and bat licensed ecologist. The trees located within the application site were subject to ground level roost assessments to determine their suitability for supporting roosting bats.
- 3.17 The trees were then placed in one of the following bat roost potential categories (**Table 4** refers), based on current best practice guidelines (Collins, 2016).

**Table 4:** Categorisation of Bat Roosting Potential of Trees

Level of Bat Roosting Potential	Rationale
Confirmed Roost	Presence of bats or evidence of use by bats.
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but unlikely to support a roost of high conservation status.
Low	A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Negligible	Negligible habitat features likely to be used by roosting bats.

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### *Bat Activity – Manual Transect and Automated Detector Surveys*

- 3.18 Transect surveys were carried out in line with standard methodologies as recommended by the Bat Conservation Trust (Collins, 2016). Although the habitat was assessed as offering *moderate* potential for foraging bats, following consultations with Herefordshire County Council ecologist on 30/04/2021 it was agreed a *low* scope of surveys was suitable given the limited impacts that is typical of solar PV schemes.
- 3.19 The survey effort therefore comprises two walked bat activity surveys per season; Spring, Summer and Autumn. Surveys were undertaken in April, July and September 2021. Surveys commenced at sunset and continued until 3 hours after sunset.
- 3.20 Regular three-to-five-minute stopping points were located along a pre-defined transect route (**Figure 8** refers) with all bat passes noted. Where constant foraging was recorded at a stopping point, this was assigned a value of 30 bat passes per minute. The starting locations varied for each survey. The weather conditions and survey timings are presented in **Appendix D**. Surveyors were equipped with broadband full spectrum electronic bat detectors and recording devices for all activity surveys.
- 3.21 The manual transect surveys were supplemented by a minimum of five nights of full spectrum static bat detectors recording per season per transect, with detectors positioned in different locations every season to gain data around the whole site.

### *Analysis*

- 3.22 Bat echolocation calls were analysed using Analook and Kaleidoscope software, with bat species identified by comparison of sonograms with a reference of echolocation call parameters and library of known echolocation calls. Calls were assigned to species level where possible. Where this was not deemed possible, identification to genus level was made.
- 3.23 In addition to this, one in ten noise files were checked to confirm that the Kaleidoscope programme was running optimally for the site for which it was analysing data i.e., that background noise was not interfering with the labelling parameters. Where this was not the case, noise files were manually processed.
- 3.24 Full details of the bat activity surveys can be found in **Appendix D**.

### Breeding Birds

- 3.25 The breeding bird survey (BBS) covered the site and its immediate surroundings. The objectives of the BBS were as follows:
- Identify the presence and distribution of breeding birds on the site;
  - Evaluate the importance of local bird populations and their habitat requirements;
  - Evaluate the conservation importance of the site;
  - Identify areas of ornithological interest and make recommendations to minimise the potential impact of the proposed development and where feasible, consider opportunities for additional habitat creation.
- 3.26 The survey methodology was broadly based on the British Trust for Ornithology's (BTO) Common Bird Census (CBC). Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. The

criteria used for the assessment of breeding birds has been adapted from the standard criteria proposed by the European Ornithological Atlas Committee (EOAC, 1979) and was grouped into three categories:

- Possible breeder (e.g., birds observed in suitable habitat or singing male recorded);
- Probable breeder (e.g., pair in suitable habitat, territory defended, agitated behaviour or nest building); or
- Confirmed breeder (e.g., recently fledged young observed, adult birds carrying food for young).

3.27 Birds considered to be not using the site for breeding will be categorised as ‘non-breeders’ (e.g., flying over the site, migrant, habitat not suitable).

3.28 To provide a reasonable level of accuracy for determining the population status of the breeding birds on the site, four survey visits were undertaken between 05.00 and 11.00 and one survey between 18:30 and 22:30 during the period April and mid-June 2021 on the following dates:

- 1<sup>st</sup> April 2021;
- 23<sup>rd</sup> April 2021;
- 14<sup>th</sup> May 2021; and
- 15<sup>th</sup> June 2021.

**Table 5:** BBS visit summary

Date	Start/End	Time	Temperature (°C)	Visibility	Cloud Cover (%)	Beaufort Scale	Rain
01/04/2021	Start	6.10	3	Good	20	0-1	Dry
	End	10.10	10	Good	30	0-1	Dry
23/04/2021	Start	06:20	-1	Excellent	0	0-1	Dry
	End	10:05	11	Excellent	0	1-2	Dry
14/05/2021	Start	05:53	7	Good	100	1	Dry
	End	09:51	8	Good	100	1	Dry
15/06/2021	Start	18:30	23	Excellent	0	2	Dry
	End	22:29	16	Dark (after sunset)	0	0-1	Dry

3.29 Upon completion of the four breeding bird survey visits, a territory mapping exercise was undertaken. This exercise assessed the number and distribution of target breeding bird species across the site to inform an impact assessment and identification of suitable mitigation/compensation measures.

3.30 Birds will make use of many forms of vegetation for nesting purposes and, for the purposes of assessing potential impacts and informing mitigation, it is therefore assumed that common and widespread species of birds could be nesting in any hedge, scrub or tree habitats present on site.

3.31 Whilst the survey recorded all birds present within and immediately adjacent to the application site, the assessment itself was confined to certain 'target species'. Target species are defined as those occurring on the following lists:

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- Section 41 of the Natural Environment & Rural Communities Act 2006;
- Red or Amber list of Birds of Conservation Concern 5 (Stanbury et al, 2021); and
- Herefordshire Biodiversity Action Plan.

#### Wintering Birds

3.32 Four wintering bird visits were undertaken at the application site between November 2020 and February 2021. The site was surveyed by walking all of the field boundaries and observing, counting and recording all wild birds present. The survey was carried out by an experienced ecologist with over 15 years' experience of undertaking ornithological surveys in the UK.

3.33 The transect route passed all parts of the site that fall within 50 m and species registrations were recorded on a suitably scaled survey map. Evidence of bird presence including feathers and droppings was also recorded. Prior to each walked transect, the site was also subject to a scan using optical equipment to ascertain any presence of species that would be disturbed by human presence.

3.34 Wintering bird surveys were undertaken on the following dates by a suitably qualified ornithologist:

- 23 November 2020;
- 23 December 2020;
- 27 January 2021; and
- 26 February 2021.

#### Great Crested Newts Surveys

##### *Habitat Suitability Index*

3.35 Fourteen waterbodies were identified within 500 m of the site. Of these, four were present within the site, with a further seven accessible for further assessment. Where access allowed, these waterbodies were subject to Habitat Suitability Index (HSI) assessment concurrently with the Phase 1 Habitat Survey.

3.36 HSI is a tool to assess the likelihood of a water body to support GCN. It incorporates ten suitability indices (SI), all of which are factors thought to affect the suitability of a water body to support GCN, such as the quality of water and the presence/ absence of different predators (particularly fish and waterfowl). Each variable is assessed separately and then mathematically combined to provide a numerical index, between 0 and 1, as categorised within **Table 6** below. The following equation is used:

$$HSI = (SI1 * SI2 * SI3 * SI4 * SI5 * SI6 * SI7 * SI8 * SI9 * SI10) / 10$$

**Table 6:** Categorisation of HSI Scores

HS Score	Pond Suitability
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

*Environmental DNA (eDNA)*

- 3.37 Ponds within 250 m of the proposed scheme were subject to eDNA. A total of nine ponds had eDNA samples taken on 20/04/2021 by suitably experienced and licensed ecologists (refer to **Appendix F**).
- 3.38 eDNA sampling comprises the collection of water samples from waterbodies, which are then tested in a laboratory for the presence of environmental DNA (eDNA). This comprises material which is deposited by GCN into the ponds in which they live and can comprise: skin cells, faeces, mucus, sperm or eggs etc.
- 3.39 The sampling process comprises the collection of water samples from around the edge of a waterbody, mixing the samples and then sending off a proportion of the mixed sample to an accredited laboratory for analysis. eDNA sampling has a 99.3 % detection efficiency, compared with 76 % for bottle trapping, 74 % for torch surveys and 44 % for egg searches.
- 3.40 Samples were analysed by SureScreen Scientifics for great crested newt DNA, using real-time Polymerase Chain Reaction (PCR) as detailed within (Biggs et al. (2014)).

*Population Class Size Assessment*

- 3.41 Following the results of the eDNA surveys, four of the waterbodies were subject to a population class size assessment. The surveys were undertaken by suitably experienced and licenced ecologists, during optimal weather conditions i.e., little wind, no rain and overnight temperatures >5°C. Where possible, torch survey and bottle trapping were used, supplemented by netting if necessary.
- 3.42 Detailed survey results are found in **Appendix E**.

**Consultation**

- 3.43 Consultation with the Herefordshire County Council Ecologist was undertaken on 30/04/2021 via telephone and email wherein the potential impacts from the proposed development on ecology were discussed. As set out above, a reduced scope for the bat surveys was agreed.

**Notes and Limitations**Desk Study

- 3.44 The lack of records for a species within the search area does not necessarily indicate the absence of the species but could merely be the lack of recording within that area.

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### Phase 1 Habitat Survey

- 3.45 Phase 1 habitat surveys can be undertaken at any time of the year; however, the optimum time of year for these surveys to be undertaken is between April and September (inclusive). The main site survey was undertaken outside the optimal period (in October). However, given the limited diversity of habitats present, it is considered that this limitation has not constrained the results in this report.
- 3.46 The survey area was visited over the period of one day. As such seasonal variations could not be observed and it is likely that only a selection of all species that occur within the site will have been recorded. However, it is considered that the combination of historic records from the desk study and the site visit provides an accurate representation of the various habitat types present at the site and their potential to support protected species. It is therefore considered that this was not a limitation to the study.

### Bats

#### Activity Surveys

- 3.47 The activity surveys undertaken in April started at 8 °C which is below the recommended 10 °C. Weather conditions were particularly cold in April of 2021.
- 3.48 Bat surveys undertaken using bat detectors are inherently biased as bats with louder calls (such as the *Nyctalus* species) will be recorded at a greater distance (and therefore more frequently) than species which use quiet calls such as *Plecotus* sp.
- 3.49 Long-eared bat (*Plecotus* sp.) is a species that generally only emerges in full darkness, and which has a very quiet echolocation call, generally not detectable in the open if more than 2-3 m from the bat detector. As a result, long-eared bats are difficult to detect during activity surveys and it is likely this species is under-recorded during such surveys.
- 3.50 Horseshoe bats (*Rhinolophus* sp.) are a genus that have directional echolocation and therefore are not always recorded on the bat detectors. As a result, horseshoe bats are difficult to detect during activity surveys and it is likely this species is under-recorded during such surveys. However, their roosting exiting behaviour raise the chance of detector through the timing of emergence and light sampling behaviour.
- 3.51 Species identification by sonogram is limited (to a certain extent) by similarities in call structure. In addition, all bats can modulate their calls according to the habitats they are navigating, their behaviour and the information they require at the time. This imposes limitations on reliable analysis particularly between species in the genera *Plecotus*, *Myotis* and *Nyctalus*.
- 3.52 The above survey limitations are unavoidable, and it is considered that they have not affected the robustness of the survey results for the purposes of this study. Therefore, it is considered that there were no limitations to the survey works.

#### Breeding Birds and Wintering Birds,

- 3.53 There were no limitations to the surveys works for birds.

#### Amphibians

- 3.54 There were no limitation to the GCN surveys.



### Longevity of Baseline Data

- 3.55 The evidence set out in this report describes the characteristics of the application site at the time at which the survey was undertaken. Many species of wildlife are highly mobile by nature and will routinely take advantage of new opportunities, which arise within their home ranges (CIEEM, 2019). Over time this will alter the baseline conditions present at the application site. Should there be delays in the delivery of this project, it is possible that the baseline ecology will change. In the event of a significant delay (24 months) between the baseline survey and commencement of works at the application site, advice on the implications of potential changes at the application site should be sought from a suitably experienced ecologist.

### Nomenclature

- 3.56 Plant species nomenclature follows New Flora of the British Isles 3rd Edition (Stace, 2010) and bird species nomenclature follows the British Ornithologists' Union (BOU) English vernacular names in The British List: A Checklist of Birds of Britain (9th edition, 2017). Mammal nomenclature follows Mammals of the British Isles: Handbook 4th Edition (Harris and Yalden, 2008).

## 4.0 RESULTS

- 4.1 This section details the baseline ecological conditions within the application site's potential zone of influence and assesses the value of important ecological features, which are relevant to the assessment in the context of the proposed development. Relevant Appendices and Figures to the rear of this report.

### Designated Sites

#### Statutory Designated Sites

- 4.2 Statutory designations often represent the most significant ecological receptors, being of recognised importance at an international and/or national level. National Site Network designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. Whilst national designations include Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs).
- 4.3 The site is not covered by any such designation. There are, however, sites covered by such designations within the application site's potential zone of influence, described in **Table 7** below and shown in **Figure 2**.

**Table 7:** Statutory Designated Sites within the site's potential Zone of Influence.

Name of Site & Designation	Approximate Distance/ Direction from Site	Feature(s) of interest.
<b>International</b>		
River Wye SAC	3.6 km west	Designated primarily for its water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. The upland reaches comprise characteristic bryophyte-dominated vegetation and extensive <i>Ranunculus</i> beds are present in the lower reaches. Characteristic species include stream water-crowfoot ( <i>Ranunculus penicillatus</i> ssp. <i>Pseudofluitans</i> ), river water-crowfoot ( <i>R. fluitans</i> ),

Name of Site & Designation	Approximate Distance/ Direction from Site	Feature(s) of interest.
		include flowering-rush ( <i>Butomus umbellatus</i> ), lesser water-parsnip ( <i>Berula erecta</i> ) and curled pondweed ( <i>Potamogeton crispus</i> ). Significant areas of woodland are associated with the river. The river channel is largely unmodified and includes some excellent gorges. Annex I habitats present as a qualifying feature, but not a primary reason for selection includes transition mires and quaking bogs. Annex II species that are a primary reason for selection include: white-clawed crayfish ( <i>Austropotamobius pallipes</i> ), sea lamprey ( <i>Petromyzon marinus</i> ), brook lamprey ( <i>Lampetra planeri</i> ), river lamprey ( <i>Lampetra fluviatilis</i> ), twaite shad ( <i>Alosa fallax</i> ), Atlantic salmon ( <i>Salmo salar</i> ), bullhead ( <i>Cottus gobio</i> ), otter ( <i>Lutra lutra</i> ). In addition, the site supports allis shad ( <i>Alosa alosa</i> ), which is a qualifying feature.
<b>National</b>		
River Lugg SSSI	3.6 km west	The site comprises the River Lugg, its headwaters and adjacent habitats. The headwaters are characterised by a range of bryophytes in stony flushes and streamside rocks, while the riverbanks and surrounds support heather moorland, dry calcareous grassland, damp pasture and base-rich flushes. Most of the middle and lower reaches support a species-rich flora characteristic calcareous lowland rivers, with some of the lower reaches home to vegetation communities more characteristic of southern clay rivers. The site supports a number of key species, including white-clawed crayfish ( <i>Austropotamobius pallipes</i> ), otter ( <i>Lutra lutra</i> ), Atlantic salmon ( <i>Salmo salar</i> ), bullhead ( <i>Cottus gobio</i> ) and Twaite shad ( <i>Alosa fallax</i> ).
Lugg and Hampton Meadows SSSI	4.1 km south-west	The site is designated for its species-rich neutral grassland, including the nationally scarce MG4 meadow foxtail <i>Alopecurus pratensis</i> – great burnet <i>Sanguisorba officinalis</i> and MG5 crested dog's-tail <i>Cynosurus cristatus</i> – common knapweed <i>Centaurea nigra</i> grasslands, and for its populations of narrow leaved water-dropwort <i>Oenanthe silaifolia</i> and mouse tail <i>Myosurus minimus</i> .
<p>SAC: Special Area of Conservation SSSI: Site of Special Scientific Interest</p>		

- 4.4 The site lies within the SSSI risk impact zones for River Wye and River Ugg SSSI.

#### Non-Statutory Designated Sites

- 4.5 Non-statutory designations are 'local sites' which are commonly of at least County level importance, and which receive protection under local planning policy only. In Herefordshire these sites are referred to as Local Wildlife Sites (LWS) (formerly Special Wildlife Sites). Additional designated sites which should be considered at this level are Other Sites of Wildlife Interest (OSWI) and Unconfirmed Wildlife Sites (UWS) where these are not covered by other designations.

- 4.6 The site is not covered by any such designation. The desk study identified 3 non-statutory designated sites within 2 km of the site, and these are summarised in **Table 8** below.

**Table 8:** Non-Statutory Designated Sites within the site's potential Zone of Influence.

Name of Site and Designation	Approx. Distance/ Direction from the Site	Feature(s) of Interest
Woodland on Shucknall Hill SWS	0.6 km south	An ancient woodland dominated by oak and hazel coppice with some larch sweet chestnut. The ground flora includes deadly nightshade and wild daffodil. The track up to the wood has a rich limestone flora.
Ash Coppice SWS	1.5 km east	An ancient wood with a belt of conifer. Oak and ash are dominant with a hawthorn and holly understorey.
Old canal at Monkhide SWS	1.6 km east	An area of open water with a wooded margin, including ash, elm, willow, hazel and hawthorn.

#### Habitats of Principal Importance and Ancient Woodland

- 4.7 The desk study identified one habitat of Principal Importance within the site. Several areas of these habitats are present within the 2 km search radius. Five areas categorised as '*No main habitat but additional habitat exists*' are present within the search radius, the closest being c.700 m to the north-west of the site. Three of these have traditional orchard as a main habitat and two have deciduous woodland. **Table 9** provides a summary of Habitats of Principal Importance within the 2 km search area.

**Table 9:** Habitats of Principal Importance

Habitat	Summary of Features	Distance from site of nearest feature
Deciduous woodland	Semi-natural deciduous woodland.	Within the site (north boundary) and adjacent to the west of the site
Traditional orchard	Open grown fruit and nut trees set in herbaceous vegetation.	0.3 km east
Ancient woodland	Areas of woodland that have persisted since 1600 or earlier, relatively undisturbed.	0.6 km south
Open mosaic	Habitat generally comprising primary successions similar to early/pioneer communities. Vegetation typically exists in small patches, with high spatial variation due to variation in both substrate and topography.	0.8 km south-east

#### **Habitats**

- 4.8 The principal habitats within and around the site, together with their dominant/characteristic plant species, were identified during the Phase 1 habitat survey. The

distribution of different habitat types within the site are mapped in **Figure 3**, illustrative photographs and target notes are also provided in **Appendix B**.

4.9 The site predominantly comprises eight arable fields, hedgerows, ponds and areas of broadleaved woodland. See **Figure 4** for field numbers.

4.10 Habitats recorded within the footprint of the site were:

- Semi-natural broad-leaved woodland (A1.1.1);
- Plantation broadleaved woodland (A1.1.2);
- Dense/Continuous Scrub (A2.1);
- Scattered Scrub (A2.2);
- Scattered Broadleaved trees (A3.1);
- Poor semi-improved grassland (B6);
- Tall ruderal (C3.1);
- Standing water (G1);
- Running water (G2);
- Arable land (J1.1);
- Intact species-rich hedge (J2.1.1);
- Intact species-poor hedge (J2.1.2);
- Defunct species-poor hedge (J2.2.2);
- Species-rich hedge with trees (J2.3.1);
- Species-poor hedge and trees (J2.3.2);
- Dry ditch (J2.3.6);
- Buildings (J3.6); and
- Bare ground (J4).

#### Semi-natural broad-leaved woodland (A1.1.1)

4.11 A patch of semi-natural broad woodland within the site is present on the southern side of field A (see **Figure 4, F8**). Species present included cherry species (*Prunus sp.*), English oak (*Quercus robur*) and ash (*Fraxinus excelsior*). In addition, along the northern boundary of the site is a strip of mature woodland dominated by ash, other species present include, willow species (*Salix sp.*), field maple (*Acer campestre*), spindle (*Euonymus europaeus*), dogwood (*Cornus sanguinea*), horse chestnut (*Aesculus hippocastanum*), common hawthorn (*Crataegus monogyna*) and English oak. The understorey comprises of bramble (*Rubus fruticosus* agg.), willowherb species (*Epilobium sp.*), stinging nettle (*Urtica dioica*), and cocks' foot (*Dactylis glomerata*). The proposed construction access track joins the site at an existing access point within this woodland strip. In addition, a small patch of woodland associated with Pond 4 adjacent to the northern boundary; species present included oak, cherry species, ash and willow species (*Salix sp.*).

#### Plantation broadleaved woodland

4.12 Two areas of plantation broadleaved woodland are present in the approximate centre of the site. Trees present within these woodlands include silver birch (*Betula pendula*), field maple, beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*), ash, willow sp., bird

cherry (*Prunus avium*) and English oak. Shrubs present within the woodland include elder (*Sambuca nigra*), common hawthorn and dog rose (*Rosa canina*). Ground flora and grasses include common nettle, cow parsley (*Anthriscus sylvestris*), bracken (*Pteridium aquilinum*), bramble, common sorrel (*Rumex acetosa*), wood melick (*Melica uniflora*) and cock's-foot.

#### Dense/continuous scrub

- 4.13 A number of small areas of dense scrub are present within the site, which was dominated by bramble. Other species present within these areas included nettle, ivy (*Hedera helix*), common hawthorn, blackthorn and willow sp. saplings.

#### Scattered scrub

- 4.14 Several patches of scattered scrub are present within the site dominated by bramble.

#### Scattered broadleaved trees

- 4.15 A number of mature oak trees are present within the arable fields on-site. Scattered trees are present around the ponds in field F and lines of trees are also present on the field boundaries. Four scattered trees, including mature specimens, are present along the hedgerow adjacent to the construction access track to the north. Species include English oak, ash, hawthorn, willow sp. and poplar (*Populus* sp.) among others.

#### Poor semi-improved grassland

- 4.16 A number of small areas of poor semi-improved grassland are present on the edges of the arable fields. Species present within these areas include broad-leaved dock (*Rumex obtusifolius*), nettle, herb robert (*Geranium robertianum*), hogweed (*Heracleum sphondylium*), thistle sp., cleavers (*Galium aparine*), cranesbill sp. (*Geranium* sp.), common sorrel, field speedwell (*Veronica persica*) and corn camomile (*Anthemis arvensis*). The construction access track passes across two poor semi-improved grassland fields to the north of the site. Grasses include perennial ryegrass (*Lolium perenne*), annual meadow grass (*Poa annua*), false oat-grass (*Arrhenatherum elatius*), Timothy (*Phleum pratense*), Yorkshire fog (*Holcus lanatus*) and cock's-foot. Forbs include broad-leaved dock, creeping buttercup (*Ranunculus repens*), greater plantain (*Plantago major*), ribwort plantain (*Plantago lanceolata*), white clover (*Trifolium repens*), dandelion (*Taraxacum officinale* agg.), spear thistle (*Cirsium vulgare*) and cranesbill sp. (*Geranium* sp.).

#### Tall ruderal

- 4.17 A number of areas of tall ruderal vegetation are present on the edges of some of the arable fields, around the ponds on-site, on the eastern access track and fringing the two grassland fields north of the site through which the construction access track passes. Species recorded within these areas include great burdock (*Arctium lappa*), nettle, thistle sp. (*Cirsium* sp.), cleavers, hogweed, white dead-nettle (*Lamium album*), broad-leaved dock, ivy (*Hedera helix*), wood avens (*Geum urbanum*) and herb robert.

#### Standing water

- 4.18 Four ponds are present on-site, two in field F and one in field A and G (see **Figure 5**). Pond 5 lies approximately 30 m east of the construction access track to the north.

#### Running water/wet ditch

- 4.19 A number of wet ditches/drains are present within and on the boundary of the site.

Arable land

- 4.20 Each of the eight fields which comprise the site are arable fields. One of these fields comprised lawn turf field D, whilst the others had been recently sown and therefore lacked vegetation. Species recorded growing on the edges of the arable field include groundsel (*Senecio vulgaris*), broad-leaved dock, field speedwell, cranesbill sp. and nettle. A strip of maize was present in on the eastern boundary of field A adjacent to the strip of plantation woodland. Species recorded within this area include corn camomile, thistle sp., common poppy (*Papaver rhoeas*) and field speedwell. A further arable field, recently sown, makes up the majority of the route the construction access takes to the north of the site.

Dry ditch

- 4.21 Two dry ditches are present within the site; one on the eastern access track and another on the boundary between fields G and H.

Buildings

- 4.22 A barn is present in the south-west corner of field A, which is constructed from corrugated metal with a timber frame.

Bare ground

- 4.23 Bare ground is present along the two access tracks on the southern side of the site, between field E and field D and between field G and field H.

Hedgerows

- 4.24 A number of hedgerows bisect / bound the site. A description of each hedgerow is in **Table 10** below and a plan showing the hedgerows can be found in **Figure 4**.

**Table 10:** Description of hedgerows on the site.

Hedge No	Description & Species	Species rich/poor	Intact/defunct
H1	Defunct hedgerow on the northern boundary of field E comprising hawthorn, hazel, elder, bramble, ash, field maple and blackthorn ( <i>Prunus spinosa</i> ).	Rich	Defunct
H2	Defunct hedgerow on the eastern edge of the strip of plantation woodland in the centre of the site. Species include hawthorn, clematis ( <i>Clematis vitalba</i> ), hazel ( <i>Corylus avellana</i> ) and bramble.	Poor	Defunct
H3	Defunct hedgerow on the northern boundary of field G comprising field maple, hawthorn, blackthorn, ash, spindle ( <i>Euonymus europeaus</i> ), bramble, elder and hazel.	Rich	Defunct
H4	Hedgerow between fields G and H. Species include hawthorn, blackthorn, elm and dog rose. Two significant gaps are present.	Poor	Defunct
H5	Hedgerow with trees in the north-eastern corner of field H comprising hazel, ash, hawthorn, elm and bramble	Poor	Intact
H6	Defunct hedgerow with trees on northern boundary of field I comprising field maple, hawthorn, willow sp., hazel. Lesser celandine ( <i>Ficaria verna</i> ) was present at the base of the hedgerow.	Poor	Defunct

H7	Hedgerow with trees on the eastern boundary of field I comprising common hawthorn, blackthorn, elder, willow sp, hazel, English elm, English oak and bramble.	Rich	Intact
H8	Hedgerow with trees on the eastern boundary of field H comprising oak, hawthorn, ivy and blackthorn. Gaps are present at the base of the hedgerow	Poor	Defunct
H09	Blackthorn hedgerow with trees on the southern boundary of field G. Some gaps are present.	Poor	Defunct
H10	Common hawthorn hedgerow.	Poor	Intact
H11	Hedgerow with trees, species present included common hawthorn, blackthorn, bramble, dog rose, field maple. Willow sp, elder, ash, and English oak.	Rich	Intact
H12	Hedgerow with trees species present included common hawthorn, blackthorn, hazel, bramble, field maple. Willow sp, elder and English oak.	Rich	Intact
H13	Hedgerow with trees species present included common hawthorn, blackthorn, hazel, bramble, field maple, ash and poplar sp.	Rich	Intact
H14	Hedgerow with trees species present included common hawthorn, blackthorn, hazel, dog wood, bramble, field maple, and willow sp.	Rich	Intact
H15	Hedgerow with trees species present included blackthorn, common hawthorn, bramble, field maple, dog rose, hazel, dogwood and English oak.	Rich	Intact
H16	Hedgerow with trees species present common hawthorn, bramble and English oak.	Poor	Intact
H17	Hedgerow – common hawthorn, bramble, elder, dog rose, blackthorn and field maple.	Poor	Intact
H18	Hedgerow with trees species present common hawthorn, ash, field maple, rose sp, bramble and English elm.	Poor	Intact
H19	Hedgerow with trees species present blackthorn, common hawthorn, bramble, English oak, cherry sp., ash and willow sp.	Rich	Intact
H20	Hedgerow with scattered mature English oak trees. Dominated by hawthorn, other species include rose, field maple and elder and bramble.	Poor	Intact
H21	Low lying hedgerow, with limited margin separating it from the arable field. Species present include field maple, hawthorn, elder.	Poor	Intact
H22	Hedgerow with mature ash trees, species include field maple, elder, hawthorn, rose and bramble. The hedgerow is joins with a block of woodland to the east and west.	Poor	Intact

### Evaluation

- 4.25 Overall, the majority of habitats within the site are considered to be of low intrinsic ecological value (namely the arable fields) due to the limited quality, distinctiveness and extent of the habitats present. The habitats are common and widespread but do offer opportunities for a range of protected species across the site, as discussed below. The hedgerows, ponds and woodland are of higher ecological value.

**Species****Badger**

- 4.26 The data search returned no records of badger within 2 km of the site.
- 4.27 A Confidential Badger Report has been produced for the site; this can be viewed upon request (contact The Landmark Practice, November 2021).

**Bats**

- 4.28 The data search returned over 300 records of bats from ten bat species within 4 km of the site in the past 10 years. These were:
- Common pipistrelle (*Pipistrellus pipistrellus*);
  - Soprano pipistrelle (*Pipistrellus pygmaeus*);
  - Serotine (*Eptesicus serotinus*);
  - Noctule (*Nyctalus noctula*);
  - Brandt's (*Myotis brandtii*);
  - Whiskered (*Myotis mystacinus*);
  - Natterer's (*Myotis nattereri*);
  - Brown long-eared (*Plecotus auritus*);
  - Lesser horseshoe (*Rhinolophus hipposideros*); and
  - Western barbastelle (*Barbastella barbastellus*).
- 4.29 The majority of the records were for bats in flight with some roosts being recorded.
- 4.30 In addition, there are ten records of European Protected Species Licensing (EPSL) within 4 km of the site (**Table 11** refers).

**Table 11:** Granted EPSL Records Present Within 4 km Search Radius.

Date of Granted Application	Species	Licensable Activity	Approximate Distance from Site
2009	C-PIP, S-PIP, BLE, BRAN, NATT, WHISK	Destruction of a breeding site and destruction of a resting place	0.03 km north
2013	BLE, L-HORSE	Destruction of a breeding site and destruction of a resting place	1.3 km south
2015	BLE, C-PIP	Destruction of a breeding site and destruction of a resting place	2.8 km south-west
2013	BLE, C-PIP, L-HORSE	Destruction of a breeding site and destruction of a resting place	3.3 km south-west
2009	C-PIP, BLE, NATT	Destruction of a breeding site and destruction of a resting place	3.5 km east
2013	BLE, L-HORSE, WHISK, NATT	Destruction of a breeding site and destruction of a resting place	3.5 km east



2016	BLE, L-HORSE, WHISK, NATT	Damage and destruction of a breeding site and damage and destruction of a resting place	3.5 km east
2012	C-PIP;S-PIP;BLE	Destruction of a resting place	3.8 km west
2015	C-PIP, BLE, NATT	Damage of a resting place and destruction of a resting place	3.9 km north
2016	BARB,BLE,C-PIP,L-HORSE,NATT,S-PIP	Destruction of a resting place	4 km north-east

KEY: C-PIP = Common pipistrelle, S-PIP = Soprano pipistrelle, BLE = Brown long-eared, NATT = Natterer's, WHISK = Whiskered, BRAN = Brandt's, BARB = Western barbastelle, L-HORSE = Lesser horseshoe

#### *Assessment of Foraging Quality*

- 4.31 The habitats within the site and surrounding landscape were evaluated for commuting and foraging bats within the criteria set out **Table 3** above. The linear boundary features (network of hedgerows, mature trees, ponds and drainage ditches) are likely to support a variety of bat species. The eight arable fields are of lower suitability. In addition, the presence of woodland edge is key habitat for foraging bats.

#### *Roosting Bats*

- 4.32 Large numbers of mature trees are present in the field boundaries, with many noted as offering features that could be exploited by roosting bats. The building within the site was deemed to have negligible potential for roosting bats due to its construction (corrugated metal) and open nature.
- 4.33 Trees with the field boundaries were assessed for their potential to contain bat roost (following best practice guidelines – see **Table 4**). In addition, trees to be removed were surveyed in November 2021 once the scheme layout was finalised, these are highlighted in bold in **Table 12**. The location of the trees can be seen on **Figure 6** and the roost categorisation is present in **Table 12**.

**Table 12:** Preliminary Ground Tree Roost Assessment Results.

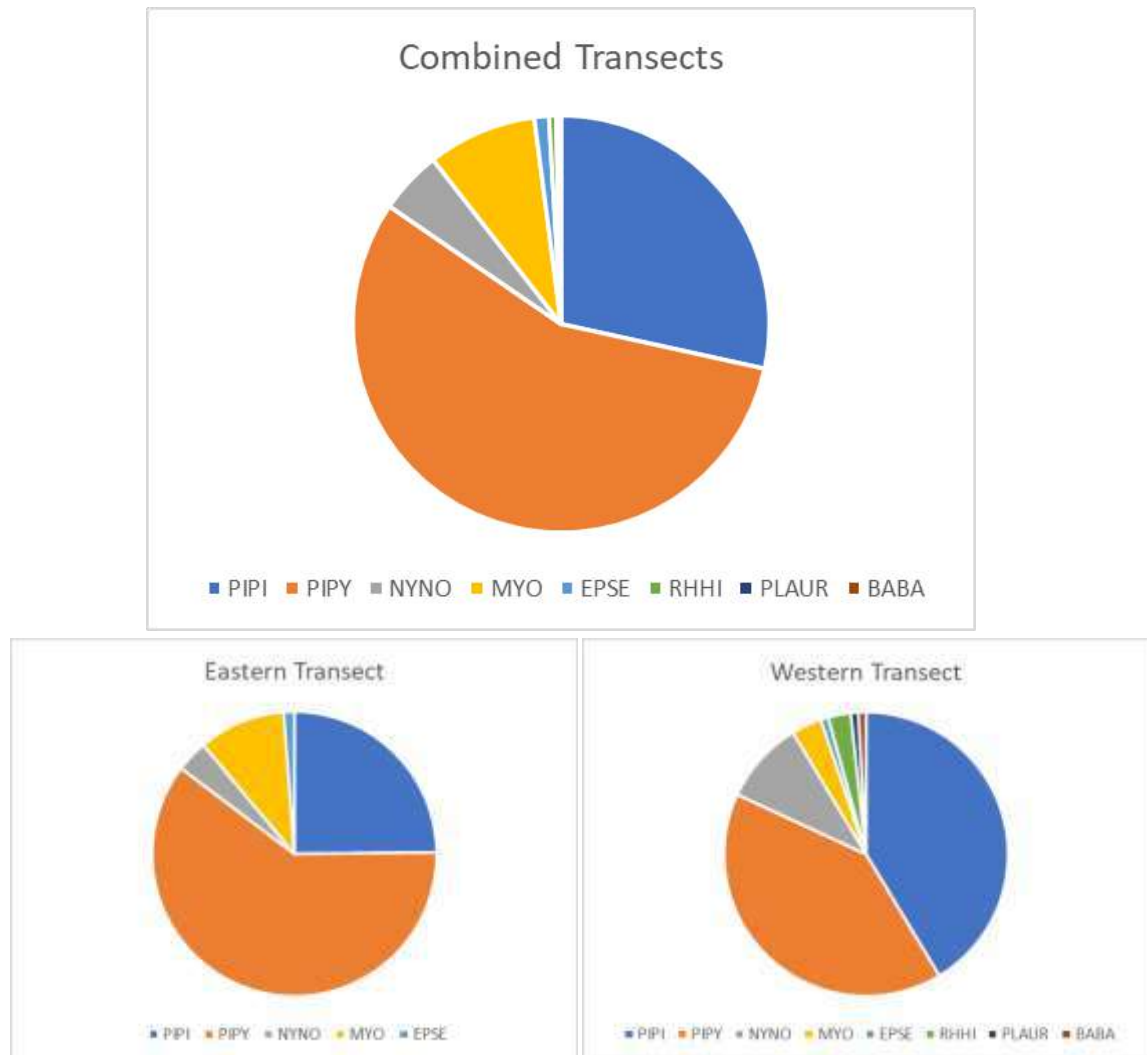
Tree No.	Species	Roost potential
<b>T1 (T60*)</b>	<b>Ash</b>	<b>Moderate</b>
T2	Oak	Low
T3	Oak	High
T4	Oak	Moderate
T5	Ash	Low
T6	Ash	High
<b>T7 (T30*)</b>	<b>Ash</b>	<b>High</b>
T8	Oak	Moderate
T9	Oak	Moderate
T10	Ash	Low
T11	Common hawthorn	Low
T12	Oak	High
T13	Oak	Moderate
T15	Oak	Moderate

T16	Oak	High
T17	Oak	Moderate
T18	Oak	Negligible
<b>T19 (T9*)</b>	<b>Ash</b>	<b>Negligible</b>
<b>T20 (T18*)</b>	<b>Ash</b>	<b>Moderate</b>
<b>T21 (T16*)</b>	<b>Ash</b>	<b>Negligible</b>
<b>T22 (T32*)</b>	<b>Ash</b>	<b>High</b>

\* Tree number as per arb report – in order for cross referencing

#### *Bat Activity Surveys – Walked Transect*

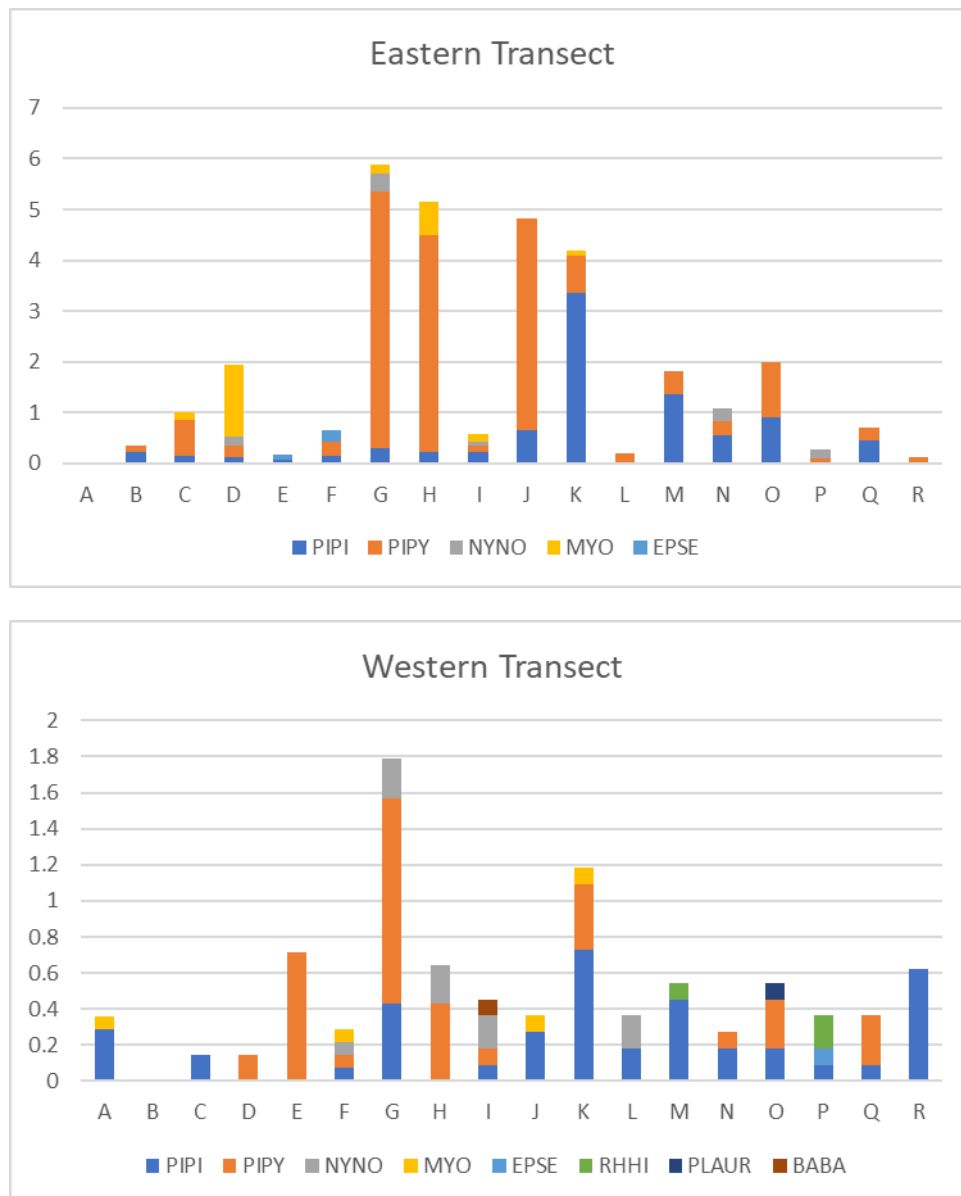
- 4.34 The manual transects survey data is summarised in **Appendix D**, the transect routes and result are shown in **Figure 8** with the green transect route being the western transect route and blue transect route being the eastern transect route.
- 4.35 Foraging and commuting activity during the transect surveys was recorded for eight different species:
- Common pipistrelle;
  - Soprano pipistrelle;
  - Noctule;
  - Serotine;
  - *Myotis* sp;
  - Brown long-eared;
  - Lesser horseshoe; and
  - Barbastelle.
- 4.36 The majority of the bat passes encountered during the Western Transect surveys were attributed to common pipistrelle comprising (41.4 %, 48 passes) and soprano pipistrelle (40.5 %, 47 passes). Noctule (9.5 %), *Myotis* sp. (3.4 %) and lesser horseshoe (2.6 %) were recorded 11, 4 and 3 times respectively. Serotine, brown long-eared and barbastelle were each recorded on a single occasion and combined accounted for 2.6 % of all passes.
- 4.37 The majority of the bat passes encountered during the Eastern Transect surveys were attributed to soprano pipistrelle (60.5 %, 251 passes) and common pipistrelle (24.8 %, 103 passes). Other species recorded include *Myotis* sp. (9.9 %, 41 passes), noctule (3.6 %, 15 passes) and serotine (1.2 %, 5 passes).
- 4.38 Combined, soprano pipistrelle and common pipistrelle contributed 56.1 % (298 passes) and 28.4 % (151 passes) of all passes respectively. *Myotis* sp. comprised 8.5 % (45 passes), followed by noctule (4.9 %, 26 passes), serotine (1.1 %, 6 passes), lesser horseshoe (0.6 %, 3 passes), brown long-eared (0.2 %, 1 pass) and barbastelle (0.2 %, 1 pass). The cumulative proportions of species are presented in **Chart 1** below.

**Chart 1: Summary Results of Transects**

- 4.39 The greatest amount of bat activity was recorded along the woodland strip at the north of the site during transect surveys. Other reasonable levels were associated with foraging and commuting bats utilising the hedgerows and woodland which bound and bisect the site, and a pond present close to the northern boundary of the site.
- 4.40 The highest level of activity for bats in the Eastern Transect was recorded on the northern boundary of the site - adjacent to Pond 4 and along the edge of the woodland which bounds the site - and on the northern edge of the strip of plantation woodland between Fields G and H. Soprano pipistrelles were recorded at between 4.2 and 5.1 passes per minute at Stops G, H and J, while common pipistrelles were recorded at 1.4 and 3.4 passes per minute at Points M and K respectively. The majority of *Myotis* sp. passes were recorded at Point D (24 passes), which is located next to the block of plantation woodland between Fields E and D (approximately 1.4 passes per minute), but they were also recorded elsewhere on the boundaries of Field E and adjacent to Pond 4. Noctule bats were recorded in low numbers at five stopping points, with the highest number of passes at a single stopping point being 6 passes at Stop G, which is located next to Pond 4.
- 4.41 **Chart 2** shows average levels of bat activity at each stopping point. Stops G, H, J and K had the highest levels of activity on the eastern transect, comprising between 4.2 and 5.9 passes per minute.

4.42 Activity in the Western Transect was more evenly spread across the transect, with no strong areas of preference identified. Stops G and K, both located on the edge of woodland, had the highest levels of activity, with 1.8 and 1.2 passes per minute recorded at these stops respectively. Pipistrelles were found across the transect. Noctule passes were all recorded at stopping points located on or close to woodland edges, on the northern and western boundaries of the site (F, G, H, I and L). Similarly, 3 of the 4 *Myotis* sp. passes were at stopping points on woodland edges on the northern and western boundaries of the site. The three lesser horseshoe passes were recorded at Stops M and P, which are located on the boundaries of Field A. The single western barbastelle pass was recorded at Stop I, located on the northern/western boundary of the site adjacent to a large tract of deciduous woodland, the typical habitat of this species (**Chart 2**).

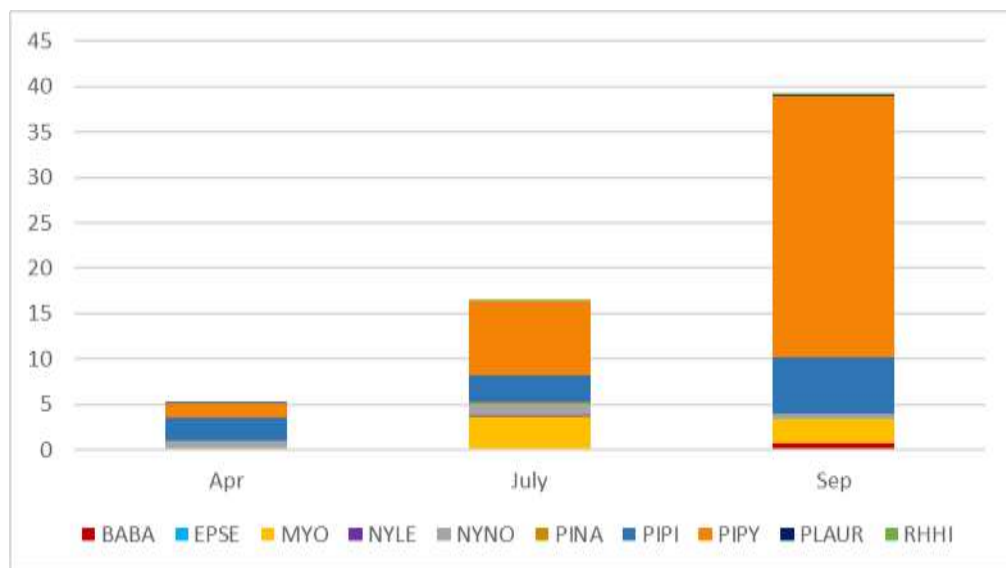
**Chart 2:** Passes Per Minute at Stopping Points by Transect



4.43 A total of ten bat species were recorded during the static detector surveys. These included the species recorded during the manual transect surveys, with the addition of Nathusius’ pipistrelle (*Pipistrellus nathusii*) and Leisler’s (*Nyctalus leisleri*).

4.44 **Figure 9** illustrates the locations of the static detector deployments, the results of these surveys are summarised in Appendix C. The level of bat activity around the site was considered as a whole to be moderate, with 20.3 mean bat passes per hour for the whole survey area. As shown in Chart 3, distribution was not consistent across the surveyed months, with the greatest levels of activity shown in September and lowest activity in April. This may be in part explained by weather conditions, with sunset temperatures lower during the April deployment (8-11 °C) than the September deployment (13-17 °C). Sunset temperatures during the July deployment were highest (19-24 °C). Night-time rainfall and wind speeds - 0.9-4.5 (m/s)<sup>1</sup> in July and 2.2-4.5 (m/s)<sup>2</sup> in September - were similar during both the July and September deployments. Given that bat activity was higher.

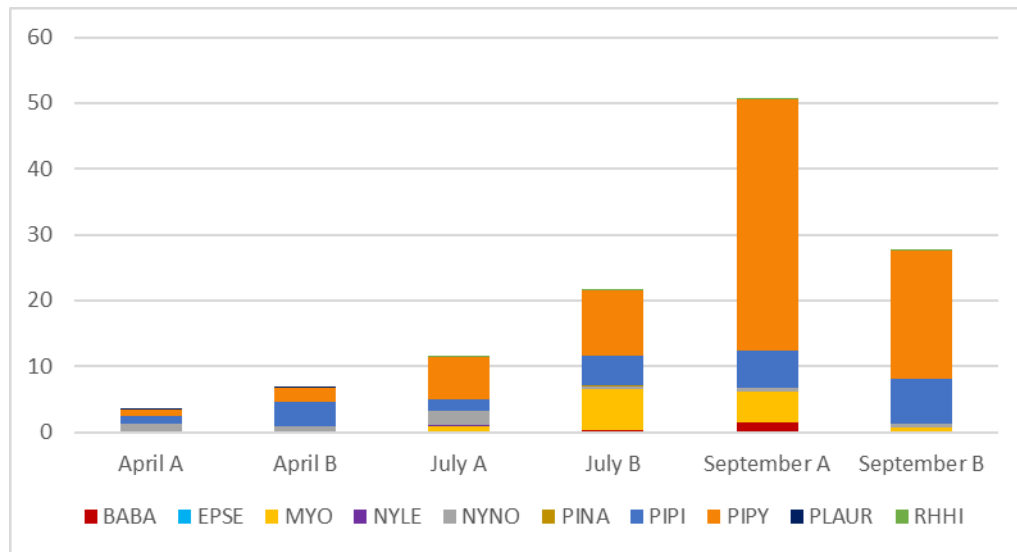
**Chat 3 – Statics – Mean Passes per Hour (by Month)**



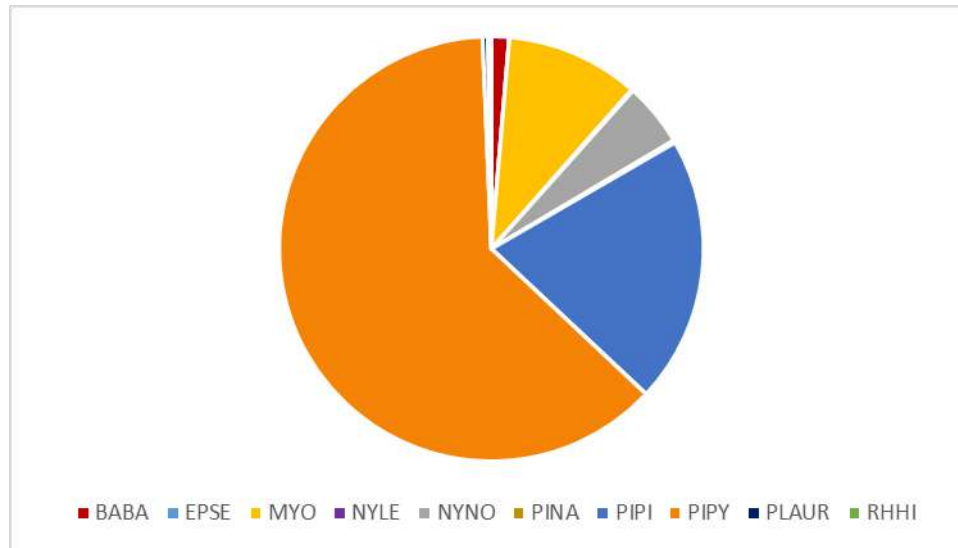
4.45 There was variety in activity levels for each location, with September A recording the most activity, followed by September B and July B. These locations were quite geographically disparate across the site.

<sup>1</sup> Slack and Tinsley (2015) found a reduction in bat activity at wind speeds of 5.4m/s and greater (Collins, 2016).

<sup>2</sup> Slack and Tinsley (2015) found a reduction in bat activity at wind speeds of 5.4m/s and greater (Collins, 2016).

**Chart 4: Mean Passes per Hour per Species**

- 4.46 In accordance with the manual transects, soprano pipistrelles accounted for the largest proportion of calls recorded during the static detector surveys (**Chart 5** refers), making up 62.3 % of recordings (3353 passes), with the addition of common pipistrelles increasing this proportion to 82.7 %. *Myotis* sp. comprised 10.2 % (546 passes) with noctule 4.9 % (261 passes) and barbastelle 1.3 % (72 passes) of total passes recorded.
- 4.47 The remaining species made up approximately 1 % of passes recorded, including 23 passes by brown long-eared, 13 passes by lesser horseshoe, 10 passes by Nathusius' pipistrelle, 6 passes by Leisler's and 1 pass by serotine.
- 4.48 Both barbastelle and lesser horseshoe are rare species, found in southern and central England and Wales, and are listed on Annex II of the EC Habitats Directive (Council Directive 92/43/EEC). Barbastelle was recorded in almost every month, with only April A failing to record this species. The majority of the 72 total passes were recorded by September A (57 passes) and July B (11) passes.
- 4.49 Given that so few passes of lesser horseshoe were recorded (13 passes at an average of 2.6 passes per day over the whole period of 15 days), it is unlikely the site is of importance to this species and is only infrequently used by the species for commuting purposes.

**Chart 5: Statics Proportion of Bat Species**

### *Evaluation*

- 4.50 In summary, although a range of species have been recorded within the site, the majority of the activity noted is attributed to soprano and common pipistrelle. These species are not considered rare at either a local or national level. The vast majority of species found are regionally common, and those that are present would be expected to be associated with the habitats present on site.
- 4.51 Moderate numbers of bat passes were recorded, indicating that the site is relatively well used by foraging and commuting bats, and is likely to be representative of an important resource within its wider landscape context i.e., being a component of a wider network. As such, the site is considered to be of **Local** value.

### Dormouse

- 4.52 No records for dormouse from within the last 10 years were returned from the data search and no records of granted EPSL for dormice were found on the MAGIC website [online].
- 4.53 The hedgerows and more mature woodland provided some potential suitable habitat for dormouse but lacked a high proportion of hazel. This was also the case of the woodland adjacent to the site. Further consideration of dormouse is required.

### Otter

- 4.54 No records of otters were returned as part of the desk study.
- 4.55 No evidence of otters was recorded during the survey. Otters could be using the streams and ditches north of the site, but it is considered highly unlikely that otters would access the site. Otters have therefore been scoped out.

### Water Vole

- 4.56 No records of water vole were returned as part of the desk study.
- 4.57 No evidence of water voles was recorded during the survey. The waterbodies on site could provide suitable habitat for water voles. The waterbodies are planned for retention therefore water voles have been scoped out of any further assessment.

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### Other mammals

- 4.58 The data search returned records of polecat (2), hedgehog (2) and brown hare (1) within the search area within the past ten years. None of the records fall within the site boundary.
- 4.59 The site is considered to have potential for all three species.

### Birds

- 4.60 The data search returned 14 records of bird species listed on Schedule 1 of the Wildlife and Countryside Act (1981, as amended) and/or Section 41 of the Natural Environment and Rural Communities Act (2006). Species include house sparrow (*Passer domesticus*), red kite (*Milvus milvus*), skylark (*Alauda arvensis*), fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*), reed bunting (*Emberiza schoeniclus*), cuckoo (*Cuculus canorus*), yellowhammer (*Emberiza citrinella*) and barn owl (*Tyto alba*).
- 4.61 The MAGIC website (online) search identified records of curlew (*Numenius arquata*) which indicates that this species is present either on-site or within 1 km of the site. The site also overlaps with priority areas for Countryside Stewardship measures addressing curlew and lapwing (*Vanellus vanellus*) habitat issues.
- 4.62 The proposed development will result in the loss of arable habitat some of which could be used by birds (bird may also be using other habitats present that are unlikely to be affected such as the trees, hedgerows and scrub). Therefore, further consideration for breeding birds is required, a suite of breeding bird surveys were undertaken see section below (breeding birds)
- 4.63 The site is also considered to provide suitable habitat for wintering birds. It is considered likely that the fields could support flocks of wintering birds (such as yellowhammer, linnet, starling etc) which could be displaced by conversion to grassland. Therefore, further consideration for wintering birds is required and a suite of wintering bird surveys was undertaken (see wintering bird section below).

### Breeding birds

- 4.64 The breeding bird survey confirmed the presence of several breeding birds of conservation concern on or immediately adjacent to the site, including yellowhammer (*Emberiza citrinella*), skylark (*Alauda arvensis*), dunnock (*Prunella modularis*), song thrush (*Turdus philomelos*), linnet (*Carduelis cannabina*), tawny owl (*Strix aluco*), common redstart (*Phoenicurus phoenicurus*), stock dove (*Columa oenas*), common whitethroat (*Sylvia communis*), wren (*Troglodytes troglodytes*) and either marsh tit (*Poecile palustris*) or willow tit (*Poecile montanus*). Other bird species of conservation concern recorded during the surveys include moorhen (*Gallinula chloropus*), sparrowhawk (*Accipiter nisus*), woodpigeon (*Columba palumbus*), red kite (*Milvus milvus*), kestrel (*Falco tinnunculus*), meadow pipit (*Anthus pratensis*), reed bunting (*Emberiza schoeniclus*), barn owl (*Tyto alba*) and mallard (*Anas platyrhynchos*). No evidence that these species are breeding on-site was found during the surveys. The results of the surveys are presented in **Figure 7**.
- 4.65 No breeding waders (i.e., curlew (*Numenius arquata*) or lapwing (*Vanellus vanellus*) were recorded, nor any other declining farmland birds i.e., grey partridge (*Perdix perdix*) that would be negatively affected by the proposed development.



- 4.66 In addition to the target species, an assemblage of common bird species typical of the lowland agricultural environmental was noted across the four visits. This included: magpie, pheasant, carrion crow, jackdaw, blue tit, great tit, nuthatch, robin, chaffinch, blackbird, chiffchaff, blackcap, grey heron, long-tailed tit, great spotted woodpecker, goldcrest, swallow and buzzard.

#### *Skylark*

- 4.67 Skylark was recorded in three fields adjacent to the site and one field on-site (Field H). The skylark recorded in Field H was observed singing during the first breeding bird survey on 1<sup>st</sup> April 2021 but was not recorded during subsequent surveys. Field H was ploughed and planted with potatoes after the first survey, and it is likely that this led to the abandonment of this territory.

#### *Dunnock*

- 4.68 A number of dunnock were recorded within the hedgerows on-site. Breeding could not be categorically confirmed, however the presence of birds in suitable habitat suggests that the application site supports at least four active territories. Dunnocks feed on a variety of insects and seeds.

#### *Linnet and Yellowhammer*

- 4.69 Numerous linnet and yellowhammer were recorded within the hedgerows and arable fields on-site, including a flock of c.60 linnet that was recorded within Field H during the first breeding bird survey visit. One linnet and two yellowhammer territories were identified, as detailed in **Figure 7**. Both species have similar habitat requirements and are granivorous, requiring a diet of seeds throughout the breeding and wintering periods.

#### *Song thrush*

- 4.70 Several song thrush territories (10) were identified within areas of woodland that bound the site and within areas of woodland and scrub surrounding the ponds on-site. Song thrush feed predominantly on earthworms and snails, and the species is in national decline. Although the majority of song thrush territories were identified outside the site or on the site boundary, it is likely that the entire site is used by this species site for foraging purposes.

#### *Wren*

- 4.71 Thirty-four wren territories were identified within the hedgerows and woodlands on-site during the breeding bird surveys. This species was recently moved up to amber from green on the fifth list of Birds of Conservation Concern (BoCC5). This was done to reflect the importance of the UK's breeding wren population, which makes up >20% of the European population (Stanbury *et al.* 2021). Wrens are insectivorous although will occasionally eat seeds.

#### *Common whitethroat*

- 4.72 Eight common whitethroat territories were recorded during the breeding bird surveys within the hedgerows and woodland edges on-site. Common whitethroat is a primarily insectivorous species, although they will eat berries in autumn, typically found in hedgerows, scrub and woodland edges. It is a migratory species that winters in sub-

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Saharan Africa and was recently added to the amber list of BoCC5 as a result of increasing rates of decline in the UK population (Stanbury *et al.* 2021).

#### *Stock dove*

- 4.73 A single stock dove territory was identified on the northern boundary of the site. Several stock doves were also recorded foraging within and commuting through or within the site. This species is largely granivorous, although will also eat berries and insects, and is found in farmland, urban parkland, and open woodland. It is likely that many of the birds seen during the surveys were using the site for foraging purposes.

#### *Common redstart*

- 4.74 Two common redstart territories were identified within the site. This species is insectivorous, although will also eat berries, and is typically found in oak woodland and hedgerows, but can also be found along streams and in parkland.

#### *Marsh/willow tit*

- 4.75 A pair of either marsh or willow tits were observed foraging just outside of the site boundary within the woodland and willow scrub adjacent to Pond 4. These species are extremely difficult to tell apart by sight. Both species are typically found in woodland habitats and the most accurate way of telling these species apart is by their call. Unfortunately, neither individual called during the survey, therefore it is not possible to confidently identify the species. Marsh tit is the more common of the two species, which have both suffered significant declines over the past 50 years. A study by Burns *et al.* (2020) found that willow tit and marsh tit having declined 94 % and 75 % since 1970 respectively.

#### *Tawny owl*

- 4.76 A male tawny owl was recorded calling within woodland adjacent to the site (to the south of Field C) during the single dusk breeding bird survey. This area of the woodland will not be affected by the proposed development. Tawny owls' nest in tree cavities and typically favour broadleaved woodland, however they will also hunt in more open landscapes such as farmland. Given the proximity to the site, it is likely that the site is used by this species as part of its supporting habitat.

#### *Red kite, sparrowhawk, barn owl and kestrel*

- 4.77 Red kite, barn owl and kestrel were recorded during the breeding bird surveys foraging within the application site. No evidence of barn owl was present inside the barn on-site, and no evidence of nesting sparrowhawk, red kite or kestrel was found within the site, although it is highly likely that these species are nesting nearby. It is possible that the mature trees that bound the fields and site may offer suitable nesting opportunities for these species, but these will not be affected by the proposed development. At the very least, the surveys show that these species are using the site as part of their supporting habitat.

#### *Mallard*

- 4.78 Several mallard were identified within the fields, ditches and ponds during the breeding bird surveys. No evidence of breeding was recorded, and the mallards were likely to be using the site for foraging purposes.

*Reed bunting*

- 4.79 A single reed bunting was identified on the western boundary of Field I during one breeding bird survey. This species is insectivorous and granivorous and is commonly found in hedgerows and farmland. No territorial or nesting activity was recorded.

*Meadow pipit*

- 4.80 Meadow pipit were recorded on two occasions – once within the site and once just outside the site to the east of Field A. No evidence of nesting activity was recorded. This species is insectivorous and is commonly found in moorland, heathland and rough grassland, although small numbers can be found on arable land.

*Woodpigeon*

- 4.81 No evidence of breeding woodpigeon was identified within the site, though numerous were recorded foraging and commuting within the site. Furthermore, multiple (>10) were identified within the section of woodland to the south of Field A during the late afternoon/dusk breeding bird survey on 15<sup>th</sup> June 2021. This section of woodland, which is to be unaffected by the proposed development, may therefore be a roost site for woodpigeon. As with wren, this species was recently moved up to amber from green on BoCC5 to reflect the importance of the UK's breeding woodpigeon population, which makes up >20% of the European population (Stanbury *et al.* 2021). The diet of the woodpigeon comprises vegetable matter such as leafy crops, seeds and berries.

*Moorhen*

- 4.82 A single moorhen was recorded within Pond 4 during. No nesting activity was observed, however suitable nesting habitat for this species is present on-site in the form of the four ponds. These ponds are to be unaffected by the proposed development. This species was also recently added to the amber list of the BoCC5 owing to increasing rates of decline in the UK population (Stanbury *et al.* 2021).

*Evaluation*

- 4.83 Overall, the application site and immediate surrounding area supports a good assemblage of breeding bird species, including ten 'target species' of conservation concern. A total of 37 species were recorded during the survey; this diversity likely to be due to the size of the site and the variety of habitats on and adjacent to the site, such as arable land, scrub, ponds, woodland and hedgerows. Overall, it is considered that the application site is of **Local** value to breeding birds. Breeding birds require further consideration as outlined in **Section 5**.

Wintering Birds

- 4.84 Whilst the breeding bird survey can identify a quantifiable number of territories within the application site, wintering bird surveys are more qualitative, as many species during winter will range over large areas of the landscape. The presence of these species is largely due to food availability which depends on the arable farming system and crops grown in any particular year.

4.85 The site provides little interest for wintering birds. Predominately common and widespread species were recorded during the surveys, with the following target species recorded:

- Starling: Starlings were recorded foraging within the site on two occasions, with a peak count of 27 birds recorded;
- Song thrush: A single bird was recorded in trees on the northern site boundary in November 2020;
- Mallard: Mallards were recorded on all four wintering bird visits. A peak count of 47 mallard were recorded during the January survey, all of which were present within temporary wet areas within Fields D and C. Mallards are an amber list species for breeding sites and not wintering sites.

4.86 In addition, the following target species were recorded flying over the site, but displayed no association with the site itself:

- Kestrel: Recorded on two occasions; peak count of 1;
- Herring gull: Recorded on three occasions; peak count of 27;
- Black-headed gull: Recorded on one occasion; peak count of 2.

#### *Evaluation*

4.87 Whilst a number of target species were recorded during the wintering bird surveys, most of these are considered 'notable' largely due to their decline as UK breeding species. With the exception of mallard, none of the other target species occurred in sufficient numbers to be of conservation concern. The presence of mallard may also be a result of local releases of birds for shooting purposes.

4.88 The suite of species and number of birds recorded is likely to be largely consistent with other areas of local agricultural land. The site is therefore considered to be of **Site** value to wintering birds.

#### Amphibians

4.89 The data search returned records of common frog (12), common toad (26), smooth newt (40), palmate newt (10) and great crested newt (GCN) (32) within 2 km of the site within the past ten years. None of the records are located within the site. The closest records of GCN for the last 10 years are located 1.1 km to the north-east of the site. There is a historical record from 1988 of GCN c.275 m south-east of the site. There is one record of a European Protected Species Licence EPSL for GCN see **Table 13**.

**Table 13** Granted EPSL Records Present Within 4 km Search Radius

Date of Granted Application	Species	Licensable Activity	Approximate Distance from Site
2010	Great crested newt	Destruction of a resting place.	3 km south-east

4.90 There were four ponds P1, P2, P3 and P4 (see **Figure 5** for locations) within the site boundary and a further 14 waterbodies within 500 m of the site.

4.91 The majority of the site (arable fields) is highly sub-optimal for GCN. The boundary hedgerows, woodland and the scrub and grassland habitats do provide some suitable

terrestrial habitat for GCN. As the site contained suitable terrestrial and aquatic habitats for great crested newts, further survey works were undertaken.

*Habitat Suitability Index (HSI) Survey and eDNA*

- 4.92 A total of 17 waterbodies were identified within 500 m of the site. Fourteen waterbodies were accessible and were subjected to HSI assessment (see **Figure 5** for locations). Results of the HSI assessment are provided in **Table 13** below, this was based on the original site boundary which later changed.
- 4.93 All accessible waterbodies within 250 m were subject to eDNA sampling in 20/04/2021 the results are presented in **Table 1**, the eDNA results are also presented in **Appendix F**.

**Table 14:** Results of HSI Assessment and eDNA

Waterbody Ref.	HSI Score	Suitability to Support GCN	eDNA results
Pond 1	0.59	Below Average	Positive
Pond 2	0.78	Good	Positive
Pond 3	0.57	Below Average	Negative
Pond 4	0.87	Excellent	Positive
Pond 5	0.31	Poor	Negative
Pond 6	0.57	Below Average	Positive
Pond 7	0.63	Average	Over 250 m
Pond 8	No access	No present	Not present
Pond 9	No access	No access	Over 250 m from original layout outside of 500 m from final layout
Pond 10	No access	No access	Over 250 m from original layout outside of 500 m from final layout
Pond 11	0.73	Good	Over 250 m from original layout outside of 500 m from final layout
Pond 12	0.66	Average	Over 250 m from original layout outside of 500 m from final layout
Pond 13	0.67	Average	Over 250 m
Pond 14	No access	No access	
Pond 15	0.52	Below Average	Negative
Pond 16	No access	No access	
Ditch 1	0.69	Average	Negative
Ditch 2	0.74	Good	Negative

- 4.94 Environmental DNA (eDNA) surveys have been undertaken to sample all ponds on site and ponds where access could be arranged within 250 m that have good connectivity to the site (**Table 14** and **Figure 5** refer). A radius of 250 m is considered sufficient in this case for assessing the GCN population on-site, given that according to Natural England's Risk Assessment Tool<sup>3</sup> 250 m forms the core range for this species.
- 4.95 A total of nine ponds were sampled for eDNA, of these positive eDNA results were returned from four ponds (Ponds 1,2, 4 and 6), negative results were returned for the remainder of the ponds and ditches. As such, further population class assessment surveys were commenced on Ponds 1, 2, 4, and 6.
- 4.96 The four positive waterbodies were subject to a full suite of population class assessment surveys for GCN which involved a total of 6 surveys per pond. The full survey results can be seen in **Appendix E**. The survey results are summarised below in **Table 15** which represents the total number of GCN observed per survey and is split between torching and trapping. The maximum adult count per waterbody per night gained through torch survey or bottle trapping is noted. Only bottle-trapping and torch survey are considered suitable methods for assessing population size class. Peak count is the maximum number of adult newts seen on one visit using one survey method.

**Table 15:** GCN Survey Data

Pond	Survey Visit						PEAK COUNT
	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	
<b>POND 1</b>							
Torched	3 Ad GCN	-	4 Ad GCN	1 Ad GCN	2 Ad GCN		<b>4</b>
Trapped	-	-	-	3 Ad GCN	1 Ad GCN	1 Ad GCN	
<b>POND 2</b>							
Torched	-						<b>3</b>
Trapped				3 Ad GCN			
<b>POND 4</b>							
Torched	3 Ad GCN		1 Ad GCN		7 Ad GCN	-	<b>10</b>
Trapped	1 Ad GCN	7 Ad GCN	2 Ad GCN	10 Ad GCN	2 Ad GCN	-	
<b>POND 6</b>							
Torched	-	-	-	-	-	-	<b>0</b>
Trapped	-	-	-	-	-	-	

- 4.97 No evidence of GCN was found in pond 6 although it did get a positive eDNA result and therefore considered to have a very low population of GCN using the waterbody. eDNA results can detect if a GCN has been present in the waterbody in the last 30 days. **Pond 1, 2 and 4 are all considered to have small populations of GCN (maximum count 10 or fewer).**

<sup>3</sup> Natural England (2020). GCN Method Statement for EPS Licence Application- Rapid Risk Assessment Tool. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/785314/gcn-method-statement.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785314/gcn-method-statement.xlsx)

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### *Evaluation*

- 4.98 The site supports a small meta-population of GCN centred on Ponds 1, 2 and 4. No evidence of GCN were noted in Ponds 6 although it is considered to have a very low population. As such the site is considered to be of at least **Local** value for GCN.

### Reptiles

- 4.99 The data search returned one record of slow worm within the 2 km search radius.
- 4.100 There is suitable habitat present (e.g., hedgerows, pond margins and woodland) that is likely to provide some foraging and sheltering opportunities for common and widespread reptile species. The majority of the site which are arable fields are not deemed suitable for reptiles. Further consideration to reptiles is required.

### Invertebrates

- 4.101 The data search did not return any records of rare or notable invertebrate species within the 2 km radius.
- 4.102 No rare or protected invertebrates were recorded during the Phase 1 Habitat Survey. Due to the lack of habitat diversity, the site is unlikely to support invertebrates of conservation concern.

### Flora

- 4.103 The data search returned records of spreading bellflower (*Campanula patula*) and bluebell (*Hyacinthoides non-scripta*). None of these records fall within the site boundary.
- 4.104 No rare or protected plants were recorded during the Phase 1 Habitat Survey. The habitats on site were considered to be common and widespread, with no indication of rare species being present.

### Invasive species

- 4.105 The data search returned records of parrot's feather (*Myriophyllum aquaticum*), rhododendron (*Rhododendron ponticum*) and turkey oak (*Quercus cerris*). None of the records fall within the site boundary.
- 4.106 No species listed on Schedule 9 of the Wildlife and Countryside Act (1981, as amended) were recorded during the Phase 1 Habitat Survey. Therefore, invasive plant species are considered absent from the site.

### Other Species

- 4.107 No suitable habitat was present for white clawed crayfish and therefore these species are considered absent.

## **5.0 DISCUSSION AND RECOMMENDATIONS**

- 5.1 This PEA Report assesses the value of, and predicts potential impacts on:

- Designated sites;
- Habitats and species of 'Principal Importance' (NERC Act 2006);
- Habitats and species listed on regional or local Biodiversity Action Plans; and

- Habitats and species afforded legal protection.

- 5.2 Where impacts cannot be avoided by inherent mitigation alone, additional mitigation or enhancement measures are set out below which would as a minimum enable the proposed development to meet legislative and/or planning policy requirements.
- 5.3 The assessment below considers potential impacts that could arise from the proposed solar scheme as outlined in **Section 1.7-1.12**. Solar PV development is typically a relatively low impact form of development with respect to wildlife. No night-time lighting is proposed, and a reasonable buffer will be provided from the habitats on site with the highest ecological value (i.e., hedgerows, woodland edges and ponds). No large sections of hedgerows will be removed as part of the proposed development. There are four small sections of hedgerow being removed no more than 2 m, to allow for a permissive path. The proposed site layout is shown in **Appendix A**.

### Designated Sites

- 5.4 As identified in **Section 4** there are three statutory designated sites within the potential zone of influence of the application site. The closest of these being River Wye SAC and River Lugg SSSI, which are both located 3.6 km west of the application site. Due to the substantial intervening distance, the nature of the development and lack of functional links, no impacts are anticipated on any statutory site.
- 5.5 The site lies within the SSSI Impact Risk Zone of River Wye and River Ugg. Developments of a certain size and nature that fall within SSSI Impact Risk Zones, require the LPA to consult with Natural England (NE) to determine whether the proposed development is likely to impact upon the SSSI. In this instance, the proposed development is not of a size and nature which requires the LPA to consult with NE.
- 5.6 The site is within the catchment of the River Lugg (Wye) SAC (Lugg-Little sub catchment); however, the proposed development does not involve creation of additional phosphate levels (foul water) therefore no impacts will occur, and Habitat Regulations Assessment is not required.
- 5.7 There are 3 non-statutory designated sites within the potential zone of influence of the site. The nearest is Woodland on Shucknall Hill which lies 600 m from the site's southern boundary. Due to the intervening distance no direct effects are anticipated to this site. Indirect effects from construction works are capable of being managed via implementation of a Construction Environmental Management Plan (CEMP) – the site is designated for habitats not fauna and so disturbance effects are not a concern.

### Habitats

- 5.8 The proposed development has been carefully designed to avoid the majority of potential ecological impacts by confining development to the interior of the fields which comprise the site, thereby avoiding impact on the higher quality (in ecology terms) boundary features, including the hedgerows, ditches and waterbodies. The agricultural fields which comprise the site are of the least ecological value. The boundary habitats namely hedgerows, ponds and areas of woodland represent the highest quality habitat (though still of Local Value). These features will be protected by the creation of a buffer between the panels and development of at least 5 m. In addition, a 25 m 'wildlife corridor', will be created in parts along Field F southern boundary, between Field C and D and the western side of Field A with a strip leading to Pond 1 within Field A. The feature will bisect the site east to west and north to south, creating permanent grassland, to be managed for wildlife.



In addition, a substantial new species rich hedgerows will be planted which is 1.24 km in length. **Appendix A** refers.

- 5.9 A Biodiversity Net Gain Assessment has been undertaken by TLP November 2021 and should be read in conjunction with this report. The summary results are that the site delivers 134.49% net gain in habitat parcels and 61.95% net gain in linear habitat (namely hedgerows).
- 5.10 The majority of the site will be seeded with species rich grassland (48 ha) and areas of wild bird seed mix grassland (0.5 ha) are proposed along the western boundary of Field C and the north-west boundary of Field F. **Appendix A** refers
- 5.11 The proposed development will require four small sections of hedgerow to be removed no more 2 m in size to be created in hedgerows for the permissive path through the site for local residents. The four gaps will be no wider than 2 m, likely to be closer to 1 m.
- 5.12 Access will use existing field entrances, access routes or existing gaps in hedgerows thus avoiding loss of habitat, though some limited management works may be required (i.e., trimming of vegetation etc.). Furthermore, the buffer areas will be protected through the use of permanent, robust security fencing during the construction and operational phases of development, though this will be permeable to wildlife (i.e., not dug in at ground level).
- 5.13 In the absence of mitigation, the proposed development could potentially result in some or all of the impacts detailed below on ecological receptors within or adjacent to the application site. The impacts can be addressed by the implementation of the recommended avoidance, mitigation and enhancement measures as discussed, in the relevant sections.
- 5.14 There is potential for accidental damage to tree and hedgerow species during construction activities. It is possible that damage to root networks could occur through the installation of panel tables and supporting infrastructure. This includes construction of transformer/inverter buildings and any trenching required for installation of cabling. To avoid such impacts, Root Protection Areas (RPAs) will be identified, and suitable protective fencing installed where required.
- 5.15 To prevent shading of the solar panels, the hedgerows will be cut annually to maintain a suitable height. Hedgerows throughout the application site are variable in condition and sensitive management practices can improve the vigour of hedgerows (by encouraging growth) and prolong their functional life. Where mature standard trees are present in hedgerows, these will be retained and protected.
- 5.16 Planting up of existing boundary hedgerows and the planting of new screening hedgerows will be implemented via a comprehensive landscape planting scheme. This includes:
- All existing hedgerows retained (with the exception of four small breaks to facilitate a permissive path), and gaps infilled, with site access utilising existing field gates and existing breaks;
  - Hedgerows relaxed to achieve 3 m height and enhanced with additional tree planting to assist in screening the development, especially along the southern and eastern boundaries;
  - Existing whip tree planting on the north, east and south boundaries of Field D to be retained and enhanced with additional native tree and hedgerow planting to

strengthen connections of on-site features and recreate historic field boundaries;  
and,

- Proposed native hedgerow along the southern boundary of Fields G and H to assist in screening of the development and recreate historic field boundaries.

5.17 This will include 1.24 km m of new hedgerow, 2.2 km hedgerow enhancement, 219 new trees, inclusion of 0.5 ha of wild bird seed mix grassland, and 48 ha of species rich grassland.

5.18 The hedgerows will be planted with native fruiting and flowering species to fill gaps and increase their species diversity. This measure represents a positive impact on the structure of the hedgerows present and will increase hedgerow habitat and enhance continuity of the hedgerow network within and beyond the application site. A range of species will be positively impacted, potentially including bats, badger, dormouse, birds, small mammals, reptiles and amphibians.

5.19 For the lifetime of the proposed development, most of the arable fields will be taken out of the normal cycle of arable production and converted to rough grassland. The change in use is likely to result in positive impacts on site ecology, including reduction or cessation of agricultural management practices (use of artificial fertilisers and pesticides) and a decrease in disturbance activities (solar parks require minimal ongoing maintenance).

5.20 It is likely that the new grassland habitat will be managed by grazing in order to control ruderals and highly competitive species and therefore promote an increase in biodiversity. Trampling and poaching by livestock also promotes growth by embedding seeds into the soil to encourage germination.

#### Landscape and Ecological Management Plan (LEMP)

5.21 To ensure that maximum benefit is gained from the creation of the site mitigation areas (boundary features, wild bird seed mix, species rich grassland and new hedgerows), a LEMP should be produced to detail the ongoing annual management requirements. The LEMP would include specifications for:

- The ongoing management of existing habitats;
- The management of newly created habitat features; and
- Ongoing ecological monitoring.

5.22 Long-term safeguarding and management of new habitats in accordance with the LEMP can be secured by an appropriately worded planning condition.

#### General Good Working Practices

5.23 Pollution prevention methods should be adhered to, similar to the currently withdrawn Pollution Prevention Guidelines (PPG), in particular PPG1 Basic good environmental practices; PPG5 Works in, near or over watercourses; and PPG6 construction and demolition sites.

#### Working in proximity to trees

5.24 An Arboricultural Method Statement accompanies the planning application. This document should be adhered to at all times during site development to avoid undue impacts on retained trees (including the veteran field trees).

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### Construction Environmental Management Plan (CEMP)

- 5.25 A range of ecological mitigation measures are required to be applied to ensure that the proposed development does not result in significant negative impacts on biodiversity. Many of these measures need to be implemented prior to, or during, the site clearance / construction phase of development. A CEMP should therefore be prepared to detail these mitigation requirements and provide a working site manual to inform site contractors and associated personnel.

### **Protected and/or Notable Species**

- 5.26 Certain species receive legal protection in the United Kingdom and are commonly known as 'protected species'. In reality, the level of protection for different species varies considerably, from protection solely against 'killing and injury' to full protection of the species and their places of refuge. Details of legal protection afforded to species/species-groups on the legislation can be found in **Appendix B**.

### Badger

- 5.27 Refer to the confidential Badger Technical Note (The Landmark Practice Ltd, Dec 2021).
- 5.28 Badgers could be active within the local area, and therefore could be impacted by construction activities, it is therefore recommended that during site construction, no excavations should be left open overnight. Where this cannot be avoided, measures to provide a means of escape for any animals that may fall in (such as a wide plank of rough sawn wood) should be provided. Above measure to be included in the CEMP.

### Bats

- 5.29 All species of British bat are listed as a European Protected Species (EPS) on Schedule 2 of the Conservation Regulations (Annex IV (a) to the Habitats Directive). This affords bats and their roosts strict protection under the Conservation of Habitats and Species Regulations 2017 (as amended). Additional protection for bats is also afforded under the Wildlife and Countryside Act 1981 (as amended) and a subset of the British bat assemblage are listed as priority species under the Natural Environment and Rural Communities (NERC) Act 2006.
- 5.30 Bat activity within the site appears to be moderate, with passes mainly associated with the boundaries of the site (which are to be retained). Notwithstanding this, the proposed development would result in the loss of some foraging resource within the site in the form of the areas covered by PV arrays, though it should be noted that on balance, the conversion of the arable fields to permanent grassland under the panels should offset such loss, though the addition of substantial new areas of grassland which would be suitable for foraging (refer BNG report TLP Dec 2021) .
- 5.31 The majority of the hedgerows and trees within the application site will be retained.
- 5.32 Four small sections of hedgerow will be removed no more than 2 m will be created within existing hedgerows (with the aim to limit to 1 m). Given the small nature of these openings it is not anticipated that these will affect flight corridors used by bats.
- 5.33 A total of six trees are proposed for removal, these are all Ash trees and are category U, which are trees with ash die back or other structural issues as follows:

- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g., where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning);
  - Tree that are dead or show signs of significant, immediate, and irreversible overall decline; and
  - Trees infected by pathogens of significance to the health and/or safety of other trees nearby, or very low-quality trees suppressing other trees of better quality.
- 5.34 Out of the six trees two have negligible potential for roosting bats whilst three others have high potential, and one has moderate potential for roosting bats (refer to **Table 4** and **Table 12**). Bats roost in trees by their very nature are difficult to identify and transient in nature. For example, features such as flaking bark (popular as a roosting site for some of our bat species) change in a relatively short period of time. Some of these relatively delicate and short-lived roost types are lost and others appear; hence tree roosting bats move between a number of roosts in the general roosting area.
- 5.35 As such, it is recommended that an update ground level tree inspection is undertaken prior to the commencement of works. Depending on the results if potential roosting features (PRFs) are identified, these should be subject to further survey (i.e., aerial assessment (if safe to do so) or emergence/re-entry survey). Enough time is available within the program of the development to allow for this. If any roosts are identified these will be removed under a licence from Natural England and will be easily mitigated for by the inclusion of tree mounted bat boxes.
- 5.36 Should any trees within the application site being retained (which is the majority of trees with the exception of the six discussed above in paragraph 5.33 to 5.35 ) support roosting bats, the construction phase of the proposed development may result in some limited disturbance from noise associated with increased vehicular movements and construction activities. This will be a minor and short-term negative impact. Work to install the fence will be offset at least 5 m from field boundaries with the panels being over this distance. Field trees being retained will have a minimum of 5 m offset from the panels which will reduce potential disturbance effects on roosting bats should they be present.
- 5.37 The use of artificial lighting is not proposed during the construction or operation of the solar park. Should artificial lighting be required, however, during the construction period it should be limited to the essential minimum throughout the application site. Any lighting to be used should avoid pointing upwards, with the spread of light being kept near to or below the horizontal. To minimise effects on light sensitive species, artificial lighting will be directional to the task for which it is required and angled away from all boundary features. Furthermore, light spill should be minimised through the use of accessories such as louvres, reflectors, hoods, covers, baffles and shields. If necessary, it is also possible to reduce light spill by painting part of the luminaire protector.
- 5.38 If required, lighting with a low UV component<sup>4</sup> or LED lamps with a low to negligible UV content (towards the warmer end of the light spectrum) should be used as UV light attracts insects, thus depleting foraging resources in adjacent habitats as well as making bats that use lit areas vulnerable to predation.

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<sup>4</sup> Such as glass luminaries with High Pressure Sodium lamps (as glass reduces the Ultraviolet component).

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- 5.39 During construction, the Site Manager must ensure that lights are managed to avoid any direct beams towards boundary vegetation. Lights must be directed as such that light does not spill beyond the site boundary and does not affect adjacent habitats.
- 5.40 The reduction or cessation of current agricultural management practices may initially reduce some bat prey items. In the longer term, however, this change is likely to increase the invertebrate biomass present (due to increased botanical diversity and vegetative structure), which may result in a positive impact on foraging bats.
- 5.41 Landscaping proposals as described above (involving the enhancement of existing vegetation and grassland habitats, and through new landscape planting) will also complement and enhance the existing bat foraging and commuting habitat resources provided by the application site and its surroundings.
- 5.42 In addition, the installation a mix of 10 no. bat boxes on mature trees throughout the site to provide new roosting opportunities for bats.

#### Dormouse

- 5.43 Dormouse is a European Protected Species (EPS) and is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 as amended. The protection afforded to this species makes it an offence to:
- Intentionally and/or deliberately capture, injure or kill a dormouse;
  - Intentionally or recklessly disturb dormouse;
  - Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a dormouse;
  - Deliberately disturb dormice in such a way as to significantly affect the ability of any significant group of dormice to survive, breed or nurture their young; and
  - Deliberately disturb dormice in such a way as to survive, breed or affect the local distribution or abundance of the species.
- 5.44 As discussed above, the boundary habitats within the application site offer potential opportunities for dormouse. However, due to the nature of the proposed development (Solar PV), this will not result in adverse effects upon those features which dormouse might utilise. Indeed, existing boundary vegetation will be retained and enhanced as much as possible both to minimise impacts on this habitat and to visually screen the proposed development.
- 5.45 All construction activity and the development footprint (i.e., to the security fence) will be buffered by a minimum distance of 5 m from the hedgerows and further if trees are present (in line with Root Protection Areas), in order to safeguard the health of the hedgerows/trees, avoid over-shading of panels and to provide sufficient distance to safeguard any features of ecological or conservation value along the field boundaries.
- 5.46 It is proposed to create four small openings within hedgerows (no greater than 2 m), the work for which will be overseen by an Ecological Clerk of Works (ECOW), in line with a Method Statement/Precautionary Method of Works as agreed with the HCC. This should

include a fingertip search which would also include a visual search for nests and opened nuts prior to commencement of works. This is in line with Government guidance<sup>5</sup>.

- 5.47 Subject to implementation of the avoidance of impacts as discussed above, a full suite of surveys is not considered to be required.
- 5.48 The change of use from agriculture to Solar PV will result in long-term benefits for dormouse, as the proposed development will reduce potential disturbance from agricultural activities and encourage more sensitive management of site hedgerows in-line with the production of a LEMP.

#### Other mammals

- 5.49 The proposed development will result in the loss of hedgehog and hare foraging and refuge habitat afforded by the site. The proposed planting of species rich grassland throughout the majority of the site and the fact the fences will be permeable for wildlife will, however, result in an overall net-gain in habitats present that are suitable for these species.
- 5.50 If clearance works are undertaken over the winter period, care should be taken to ensure that any hedgehogs present within the site are not harmed as this species hibernates over winter and is vulnerable to disturbance. Suitable measures to be included in the CEMP.

#### Birds

- 5.51 All wild birds, their nests and eggs are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), with certain species afforded additional protections under Schedule 1 of the Act, against disturbance during the nesting period.
- 5.52 The proposed development will result in the conversion of the majority of the site to grassland to facilitate field-scale solar PV, therefore there will be a loss of all of the arable farmland and thus some suitable foraging bird habitat. The boundary habitats (hedgerows and associated field margins) will be retained and protected by Heras fencing during construction activities to avoid impacts on nesting, sheltering and foraging birds, and a wildlife buffer will also be created to link up all the ponds on-site. Whilst some short-term disturbance may occur during the construction phase, this is unlikely to impact on the long-term value of the application site. The creation of the buffer zone outside the security fencing will further minimise the risk of disturbance to birds attempting to nest within the boundary habitats (hedgerows and woodland edge) long term.
- 5.53 Given the protection afforded to all breeding birds, their nests, eggs and young, it is generally recommended that the construction of the solar park and any vegetation clearance, including the future management of habitats, should be undertaken outside of the breeding bird season (March to August inclusive). If this is not practicable, then works should be preceded by a nesting bird check by a suitably qualified ecologist within 48 hours of the commencement of works. If evidence of nesting is recorded, works within that particular area should not proceed until the chicks have fledged, with a buffer zone around the active nest of 5 m minimum. In the event that Schedule 1 species such as barn owl or red kite are recorded, an appropriately sized buffer zone should be devised and

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<sup>5</sup> <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>

implemented by an experienced ornithologist to ensure that these species are not disturbed.

*Mallard*

- 5.54 The most numerous target species recorded during the wintering bird surveys was mallard, with a peak count of 47 birds (although some of these may have been released for shooting). Mallard is an amber list species, and its winter numbers are bolstered by migratory birds from Iceland and northern Europe. It remains a commonly occurring species in lowland England during the winter months. Whilst no mallard were recorded as breeding on site, the preservation and linking of on-site ponds is likely to be beneficial to this species.

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*Starling*

- 5.55 Starling was present during two of the wintering bird survey visits but was not recorded as a breeding species. It is likely that the provision of rough grassland beneath the solar panels, coupled with the mitigation proposed for linnet and yellowhammer would be beneficial to this species over the lifetime of the solar park.

*Skylark*

- 5.56 The breeding bird survey recorded three skylark territories within fields adjacent to the site and a single territory within the site, although the latter is likely to have been abandoned prematurely as a result of the ploughing of Field H in order to plant a potato crop. The installation of solar panels over much of the application site and loss of arable land would reduce the local availability of nesting habitat for skylarks and therefore reduce the likelihood of skylark nesting on-site post completion of the solar farm. A study entitled *The Effects of Solar Farms on Local Biodiversity: A Comparative Study* (Montag *et al.*, 2016) supports this, stating that:

*'...although skylarks were not found to utilise solar sites for nesting, they do incorporate them into their territorial boundaries and some of the sites may represent a valuable foraging resource for this species. An interesting focus for future research would be to assess the productivity of skylarks utilising solar and control plots. A proposed hypothesis may be that skylarks nesting adjacent to solar farms would be more productive than those on control plots due to the increase in foraging resources.'*

- 5.57 This is supported by an ongoing study by Worcester University, RSPB Centre for Conservation Science and Anesco. A blog post by the researcher states that:

*'Prior to the study we didn't think that we'd see many skylarks, as we know they like big open spaces. However, we now know they're using the solar panel arrays to sing from: flying high and then parachuting down between the rows. They were present on eight out of my nine study sites, which is encouraging<sup>6</sup>.'*

- 5.58 Skylarks rely on a mix of both insects (to feed to chicks and as prey during the spring/summer months) and mainly seed during winter. The Montag *et al* (2016) study states that:

*'The study shows that overall, both a higher diversity and abundance of birds of conservation concern utilise solar arrays when compared with control plots. This has implications for bird conservation and indicates that solar farms may be able to provide an important resource for declining species.'*

- 5.59 Less intensive management of the hedgerow buffer zones is likely to allow 'weed' species to become established, which provide a source of food for wintering skylark. In addition, the measures proposed in **Paragraph 5.62** for linnet and yellowhammer are also likely to ensure sufficient winter food provision. Based on the findings of the Montag *et al.* (2016) study, coupled with the recommendations laid out for future site management (i.e., allowing a more varied grassland structure to develop), it is unlikely that the proposed development would result in a loss of invertebrate prey for breeding skylarks. Indeed, it will likely provide an enhanced foraging resource for this species in the local area.

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<sup>6</sup> <https://community.rspb.org.uk/ourwork/b/biodiversity/posts/bird-use-of-solar-farmsinterim-results>



5.60 The solar park, for the duration of its operational phase, will provide an area that is subject to reduced disturbance pressures (i.e., agricultural activities), which are likely to be limiting the number of juvenile birds recruited into the local population. Based on the above studies, it is concluded that whilst the proposed solar park may displace nesting skylark or prevent the nesting of skylark on-site in the future, it may also provide enhanced foraging opportunities which could be utilised by pairs nesting in plentiful suitable off-site habitats nearby.

*Linnet and Yellowhammer*

5.61 Linnet and yellowhammer were both recorded nesting within the application site hedges, and a large flock of c.60 linnet was recorded within Field H. The hedgerows on site are to be retained as part of the proposed development meaning that there will be no loss of nesting habitat. Both species are granivorous, with seeds comprising the majority of their diet. Conversion of the majority of the application site into grassland may reduce the availability of seeds, particularly during the winter months.

5.62 In order to maintain sufficient foraging habitat to support these species, strips of wild bird seed mix will be sown in buffer strips alongside the western and northern boundaries of the site. A minimum of 0.5 ha should be available during each wintering period for the lifetime of the solar park. The initial proposals include 0.5 ha of wild bird seed mix. The seed mix should contain kale, linseed and quinoa (other species can be added to the mix if desired). Rotational mowing or appropriate density grazing of the remaining buffer zones would also encourage a greater structural diversity, allowing wild seed producing ruderal plants to become established.

*Dunnock*

5.63 Dunnock feed on both insects and seeds, becoming more reliant on the latter during the winter months. The provisions put in place for linnet and yellowhammer, coupled with the expected increase in invertebrate prey availability, means that it is unlikely that this species will be negatively affected by the proposed development.

*Song Thrush*

5.64 Several pairs of song thrush were recorded nesting to the north of the application site and were recorded using the site for foraging. Being a bird of 'cluttered' environments, it is not anticipated that the installation of solar panels would have a detrimental impact on this species, which may well benefit from greater forage provision during the lifetime of the solar park.

*Common redstart*

5.65 Common redstart is a summer migrant that feeds on both insects and berries. Given the expected increase in invertebrate availability and retention of suitable nesting habitat, it is unlikely that this species will be negatively affected by the proposed development.

*Marsh tit/willow tit*

5.66 A pair of either willow or marsh tits were found to hold a territory within woodland on the northern site boundary adjacent to Pond 4. Both species feed on insects, seeds and berries. The expected increased abundance of insect prey, sowing of wild bird seed strips

and retaining of suitable nesting and foraging habitat means that the development is unlikely to negatively impact whichever species is present.

#### *Tawny owl*

- 5.67 A single male tawny owl was recorded calling within woodland adjacent to the site (to the south of Field C). This area of the woodland will not be affected by the proposed development. Although this species typically favours broadleaved woodland it will also hunt in more open landscapes such as farmland, and given the proximity to the site, it is likely that the site is used by this species as part of its supporting habitat. It is likely that the conversion of the majority of the site from arable to rough grassland and the creation of buffer zones will provide increased habitat for small mammals, which provide an important food source for tawny owls. It is also likely to result in an increased abundance of invertebrates, which tawny owls are also known to feed on. It is therefore unlikely that the proposed development would result in a negative impact on this species.

#### *Wren*

- 5.68 A large number of wren territories (34) were identified within the hedgerows and woodland on-site during the breeding bird surveys. This species is resident in the UK and is highly likely to be present on-site throughout the year. The expected increase in invertebrate availability because of the proposed development and the retention of suitable nesting habitat (and the strengthening of some of the hedgerows) means that the development is unlikely to negatively impact this species.

#### *Common whitethroat*

- 5.69 Common whitethroat is a summer migrant and passage species that feeds on both insects and berries. Given the expected increase in invertebrate availability and retention of suitable nesting habitat, it is unlikely that this species will be negatively affected by the proposed development.

#### *Stock dove*

- 5.70 A single stock dove territory was identified on the northern boundary of the site and numerous stock doves were recorded foraging and commuting during the surveys. The conversion of arable farmland to grassland, and thus the potential reduction in seed availability, has the potential to impact stock dove as this species is granivorous. As stated in paragraph 5.62, it is currently proposed that 0.5 ha of wild bird seed will be sown in the forms of strips along the western and northern boundaries of the site. These will also act as a compensatory foraging resource for stock dove, Barn owl, sparrowhawk, red kite and kestrel

- 5.71 Barn owl, red kite and kestrel were recorded hunting within the application site. The Barn Owl Trust (2015) states that: '*... solar PV 'farms' have the potential to be of great benefit to barn owls as the array frameworks are typically at a height from which barn owls can perch-hunt. In order to benefit barn owls, the grass below and around the arrays should be allowed to develop into good barn owl foraging habitat – rough tussocky grassland with a litter-layer not less than 70mm deep.*' It is likely that the increased sward height both around the panel arrays and within the hedgerow buffer zones will provide increased habitat for small mammals, which provide an important food source for barn owls and kestrels. Red kites are scavengers; however, they will also catch live prey such as voles and mice. It is possible that the woodland and mature trees that bound the fields and site may

offer suitable nesting opportunities for red kite, kestrel and barn owl, but these will not be affected by the proposed development. It is therefore unlikely that the proposed development would result in a negative impact on these species.

- 5.72 A single sparrowhawk was also recorded hunting during one breeding bird survey. No evidence that this species was breeding on-site was recorded, although the woodland and mature trees that bound the site and field may provide suitable nesting habitat. Sparrowhawks predominantly prey on small birds, although will also take bats. Given the development proposals include the creation of wildlife buffers, the conversion of arable farmland to rough grassland (which should benefit their prey species) and the planting of compensatory wild bird seed strips for farmland birds, it is considered unlikely that this species will be negatively impacted by the development.

#### *Reed bunting*

- 5.73 The proposed development is also likely to have a positive impact on reed bunting using the site through the expected increase in insect prey abundance as a result of the implementation of buffer zones and conversion of arable land to permanent grassland.

#### *Meadow pipit*

- 5.74 This species was recorded once within the site and once just outside the site to the east of Field A. No evidence of nesting activity was recorded. Although meadow pipits are found on arable land, the conversion of the arable fields on-site to rough grassland and establishment of rough margins/hedgerows buffers is likely to provide more optimal habitat for this species. In particular, the expected increase in invertebrate abundance is likely to benefit this species.

#### *Woodpigeon*

- 5.75 No evidence of breeding woodpigeon was identified within the site, though numerous were recorded foraging and commuting within the site and a potential woodpigeon roost was identified within the woodland to the south of Field A. This section of woodland is to be retained. The conversion of the site from predominantly arable land to rough grassland, may therefore be a roost site for woodpigeon. The conversion of arable farmland to grassland, and thus the loss of arable crops, has the potential to impact woodpigeon as their diet comprises vegetable matter such as leafy crops, seeds and berries. The proposed strips of wild bird seed, as stated in paragraph 5.62, will also act as a compensatory foraging resource for woodpigeon.

#### *Moorhen*

- 5.76 The ponds on-site are to be retained and the creation of wildlife buffers as part of the development will provide better connectivity between the ponds and ditches on-site (see GCN section below). It is therefore unlikely that this species is negatively impacted by the proposed development.

#### Recommendations

- 5.77 The installation a mix of 10 no. bird boxes on mature trees throughout the site to provide new nesting opportunities for breeding birds.

- Hedgerows are being retained and woodland and pond protected (refer to landscape plan);
- Rough grassland is being provided along hedgerow boundaries for insect/prey provision etc;
- Implement hedgerow management plan to increase nesting provision (particularly dense vegetation at hedgerow bases/allow them to expand width ways); and
- Wild bird seed mix is proposed within the planting scheme 0.5 ha in total which will provide wintering feed provision for farmland birds.

### Great Crested Newts

- 5.78 Great crested newts are protected under Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 as amended. At the European level they are protected under Annex IV of the EC Habitats Directive. All life stages of great crested newts are protected, including eggs, larvae, juveniles and adults. They are also listed as Species of Principal Importance under Section 41 of the NERC Act (2006).
- 5.79 A small meta-population of GCN is present within the application site, centred on Ponds 1, 2, 4 and 6. The traditional approach to mitigation for GCN comprises a wide-scale trapping and translocation process, however, in the interests of proportionality, due to the small numbers of GCN identified, we consider that undertaking a wide-ranging trapping and translocation project would not be a proportionate approach to mitigation. In addition, Herefordshire is not currently covered by District Licencing, we propose to follow the traditional approach i.e., seeking to mitigate for GCN present, and retaining them in their location, as well as seeking to enhance the site to ensure the population's long-term favourable conservation status. As such, we therefore propose that mitigation to avoid impacts on GCN is implemented through a comprehensive Non-Licensed Method Statement.
- 5.80 The rationale behind the Non-Licensed Method Statement is that the ponds are being retained and buffered. In addition, all hedgerows and woodland are being retained and buffered with a minimum of 5 m buffer. The proposed development will impact upon arable fields only which are highly sub-optimal habitat for GCN. The proposed arrays will be seeded with grassland following installation and therefore the overall habitats within the site will become more optimal for GCN post construction. A 25 m GCN buffer connecting ponds to hedgerow and each other as well as woodland areas inside and outside of the site.
- 5.81 Below we have sought to outline our reasoning by taking the requirements of the three derogation tests into consideration. NE itself recognises a tendency towards a precautionary and risk-averse approach to mitigation, and that wide-scale trapping and translocations are often not the appropriate approach. A Non-Licensed Method Statement would detail the following:
- Time and Duration of Works (i.e., during winter months when GCN are inactive);
  - Pre-construction creation of wildlife buffers/exclusion zones around important retained features i.e., hedgerows and existing ponds;

- Habitat Manipulation – maintain onsite habitats in sub-optimal condition by continuing to utilise them for arable crops etc. to discourage amphibians from the proposed development area. The above creation of buffers/exclusion zones will encourage any individuals present to concentrate in these areas;
- Hand Search/Destructive Searches – should any potential refuges require removal, then works must be done so during the active season for amphibians (mid-March - Mid October, weather dependant). The hand search must be carried out by the licenced ecologist and the destructive search by careful use of an excavator under supervision;
- All works must be restricted to the designated development area and the impact of works on adjacent habitats avoided by the clear demarcation of the works area;
- Access must be via the existing track and over agreed routes only with no exceptions;
- Trenches and other excavations should be backfilled before nightfall. If this is not possible, ramps must be left to allow all wildlife to easily exit;
- All debris, rubble etc. collected during site clearance must be placed directly into skips or removed from the site immediately to avoid it becoming used as refugia;
- All new building materials must be stored on pallets or in bags to prevent them becoming used by terrestrial amphibians.

*Test 1: The activity must be for a certain purpose (for example, for scientific research or in the public interest)*

- 5.82 The proposed development of the site for renewable energy (solar PV) can be considered to be in the public interest to contribute to climate change targets.
- 5.83 Climate change is one of the greatest environmental challenges facing our world today. In May 2019, the 'Net Zero – The UK's Contribution to Stopping Global Warming' Report was published by the Committee on Climate Change. This report recommended an emissions target for the UK of net zero greenhouse gases by 2050 and concluded that this can be achieved with known technologies such as wind and solar PV.
- 5.84 The Climate Change Act 2008 was amended in June 2019 (2050 Amendment) to legislate the new target that was recommended by the 'Net Zero' Report. This legislation commits the Government to a legally binding target of at least an 80 % cut in greenhouse gas emissions by 2050 and a reduction in emissions of at least 34 % by 2020, compared with 1990 levels. A '2019 Progress Report to Parliament' (Reducing UK Emissions, July 2019) identifies that whilst emissions have fallen, achievements to date fall well short of those needed to achieve the net zero target.
- 5.85 UK Legislation outlines an immediate and pressing need for implementing renewable energy schemes within the UK, to contribute to legally binding obligations, to contribute to overall energy needs and to provide a secure energy supply.

*Test 2: There must be no satisfactory alternative that will cause less harm to the species*

- 5.86 Natural England's own guidance document WML-G24 Natural England's Application of the 'Three Tests' to Licence Applications clearly states that '*...there are always going to be alternatives to a proposal*' and that NE would expect demonstration '*... that alternatives have been considered, explain what those alternatives were, and provide a justification for their decisions to select their preferred option and discount the others as satisfactory.*'

Furthermore, it states that a '*... proportionate approach is adopted in considering the feasibility of alternative solutions relative to the degree of likely impact.*'

5.87 Therefore, taking into consideration the limited numbers of GCN identified, especially considering the abundance of waterbodies, we consider the population onsite as a relict population, reliant on a small number of ponds in declining conditions. Without the proposed development, there is unlikely to be any change in the management of onsite waterbodies, or an enhancement to improve them for GCN. Without intervention, it is considered that the ponds will over time become unsuitable for GCN, threatening the viability of the population.

5.88 As such, it is considered that a non-licenced approach would comply with this test, and NE Licencing Policy 1 which states that '*Defra considers that compensation for EPS impacts can be delivered without the need to relocate or exclude populations, where: exclusion or relocation measures are not necessary to maintain the conservation status of the local population; the avoid-mitigate-compensate hierarchy is followed; and compensation provides greater benefits to the local population than would exclusion and/or relocation.*'

*Test 3: The activity must not harm the long-term conservation status of the species (you may need to create new habitats to offset any damage)*

5.89 Field scale PV developments typically result in minor and short-term impacts (i.e., for the construction period only), as once the solar farm has been constructed, ongoing maintenance and activity at the site is limited (maintenance and management). Development proposals will include the retention and protection of field boundaries and existing ponds, with the creation of an extensive wildlife corridor which incorporates the three confirmed breeding ponds, which bisects the site east to west and south. This will support connectivity across the site and into the wider landscape.

5.90 This change in use from arable across the site will result in creation of more suitable habitat for amphibian species, i.e., permanent grassland which is managed at a low intensity (i.e., not of agricultural purposes). Furthermore, as described above, the proposals will include some much-needed management activities to the confirmed breeding ponds to secure their long-term suitability.

5.91 The creation of 5 no. hibernacula within the wildlife corridor will provide long-term sheltering and hibernating opportunities for GCN.

5.92 In summary, it is our considered opinion that the approach outlined above – a detailed avoidance, mitigation and enhancement scheme detailed within a Non-Licensed Method Statement is a proportionate approach to mitigation and will avoid impacts to GCN, and that this approach, coupled with the scheme's mitigation and enhancement will result in the long-term favourable conservation status of the GCN meta-population.

### Reptiles

5.93 All species of common reptile receive at least limited protections from harm under the Wildlife and Countryside Act 1981 (as amended).

5.94 Due to the relatively small area of the site that is suitable for reptiles, it was not deemed proportionate to undertake a reptile absence/presence survey.

5.95 If reptiles are present within the application site, it is likely they are mainly using boundary habitats (hedgerows, ditches, rough grassland margins etc). These features will be

retained and protected during the construction and operational phases of development and enhanced through landscape planting (i.e., creation of buffer zones).

- 5.96 Due to the relatively low impact of solar park installation and provided that suitable boundary habitats can be retained, it is considered that incorporation of sensitive working methods/timings etc. will be sufficient to ensure reptiles are not harmed during the construction phase. A Reptile Mitigation Strategy should therefore be prepared, this is capable of being secured by an appropriately worded planning condition.
- 5.97 Above measure to be included in the CEMP.

#### General Good Working Practices

- 5.98 The construction works footprint (including material storage) should be kept to a minimum.
- 5.99 Should any materials require storing on-site during the construction phase, materials should not be stored within 5 m of any boundary trees. They should be stored off ground (i.e., on pallets) to avoid creating sheltering habitat for animals, and waste materials should be placed into skips and removed from site. No piles of waste material should be created that could provide nesting, sheltering or hibernation habitat for protected species.
- 5.100 Pollution prevention methods should be adhered to, similar to the currently withdrawn Pollution Prevention Guidelines (PPG), in particular PPG1 Basic good environmental practices; PPG3 Use and design of oil separators in surface water drainage systems; and PPG6 construction and demolition sites.
- 5.101 In addition, noise, light and vibrations should be kept to a minimum.
- 5.102 Above measures to be included in the CEMP.

#### **Summary of Recommended Mitigation/Compensation Measures**

- Creation of buffers between sensitive boundary habitats and development footprint;
- Creation of wildlife corridors within the site (buffer for all woodland, hedgerows and ponds);
- Creation of circa 48 ha of species rich grassland;
- Extensive enhancements to Landscape including 1.25 km of new hedgerow, 219 new trees planting throughout the site;
- Adherence to Arboricultural Method Statement and Tree Protection Plan to prevent damage to boundary features and retained trees;
- Landscape planting proposals incorporate native species of local provenance with known wildlife benefit;
- Hedgerows to be managed to allow significant structure to develop benefiting foraging and commuting bats;
- Production of Landscape and Ecological Management Plan (LEMP) to ensure long-term safeguarding and management of new habitats;
- Production of Construction Environmental Management Plan (CEMP) to safeguard wildlife during construction;
- Pre-commencement badger survey;
- Pre-commencement bat tree roost assessments;

- 
- No artificial lighting expected. Should it be required, sensitive lighting only;
  - Precautionary Working Method for Dormice, in order to create four 2 m gaps in hedgerow for permissive pathways.
  - Sensitively timed site clearance to protect any nesting birds;
  - Provision of wild bird seed mix 0.5 ha in parts of the buffer areas (to be specified within LEMP);
  - Incorporation of 10 no. bat and 10 no. bird boxes on retained trees throughout the site to increase roosting/nesting opportunities;
  - Production of Non-Licensed Method Statement for GCN, including specific ecological enhancements including 25 m GCN buffer wildlife corridor;
  - Provision of 5 no. reptile hibernacula; and
  - Adherence to a Reptile Mitigation Strategy to prevent any reptile being killed or injured.
  - Biodiversity Net Gain calculations using Defra metric 3.0; and
  - General good working practice should be adhered to.

## **6.0 CONCLUSION**

- 6.1 The proposed development is not considered to have the potential to result in any significant impacts on protected species, habitats or designated sites.
- 6.2 By virtue of the relatively low impact nature of development proposals, the modest ecological constraints posed by the site's habitats and species coupled with the scale of the proposals and mitigation measures (as listed above), the scheme is capable of compliance with relevant planning policy and legislation for the conservation of the natural environment.
- 6.3 A Biodiversity Net Gain Assessment has been undertaken by TLP December 2021 and should be read in conjunction with this report. The summary results are that the site delivers 134.39% net gain in habitat parcels and 61.95% net gain in linear habitat (namely hedgerows).



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## 7.0 REFERENCES

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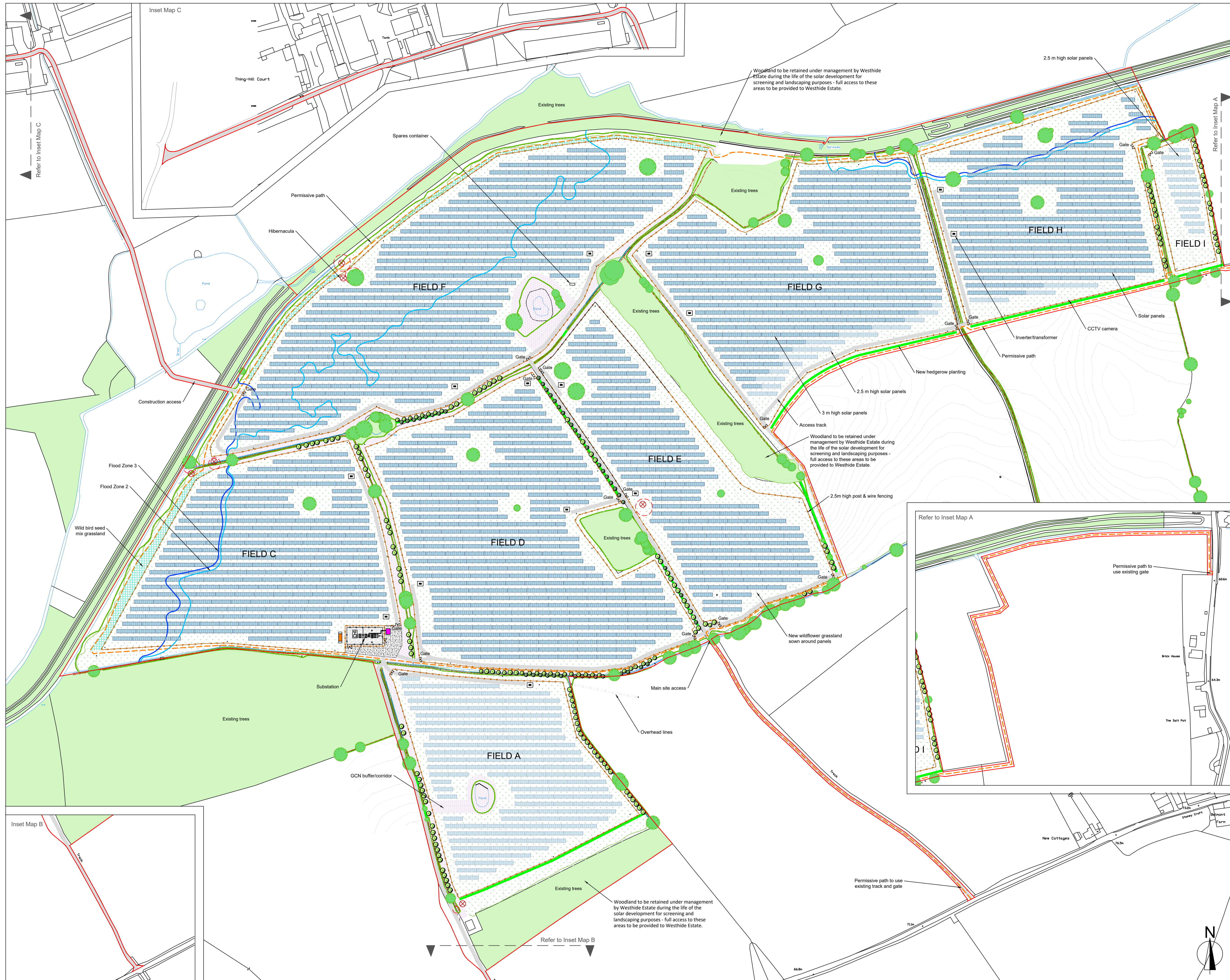
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## **APPENDIX A: PROPOSED MASTER PLAN**





- GENERAL NOTES:**
1. ALL DIMENSIONS AND LEVELS SHALL BE CHECKED ON SITE PRIOR TO CONSTRUCTION WORK COMMENCING.
  2. ALL LANDSCAPE DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND SPECIFICATIONS.
  3. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE LANDSCAPE SPECIFICATION.
  4. ANY DISCREPANCY CONCERNING THE DRAWINGS SHOULD BE REFERRED TO THE CA IMMEDIATELY.
  5. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
  6. ALL LEVELS IN METRES.
  7. DO NOT SCALE OFF THIS DRAWING.
  8. EXISTING SERVICE ALIGNMENTS SHALL BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION WORK COMMENCING.

**Legend:**

- Site boundary
- Existing woodland
- Existing tree (surveyed)
- Existing hedgerow (surveyed) all to be retained and enhanced to 3m high winter cut height
- Existing overhead utility/electricity lines (surveyed)
- Existing water course / pond
- Existing tree planting retained and enhanced
- Flood zone 2
- Flood zone 3
- Proposed tree planting (indicative - refer to Landscape Mitigation and Enhancement Plans)
- Poor quality trees to be removed (please refer to arb survey, drag # 210409-WSS-SP-AM)
- New species-rich grassland
- Proposed species-rich grassland
- Proposed wild bird seed mix grassland (0.5 ha total)
- Great Crested Newt (GCN) ecological buffer
- Hibernacula
- 2.5 m high post and wire fencing to have mammal gates for mammal access
- 2.4 m high palisade fencing (around DNO customer substation)
- Access track
- CCTV camera
- Inverter transformer unit
- DNO switch housing
- Customer substation
- Substation handstanding
- Proposed solar panels 2.5 m high
- Proposed solar panels 3 m high
- Permissive path

**DRAWING NOTES:**

Fields A, G, H and I to have 2.5 m high solar panels and 3m high for the others.

During the design development process Field B was removed from the proposals and, therefore, it is not shown or referred to on the Masterplan.

Rev.	Date	Description	Drawn	Ch'd
A	21/09/2021	Ecology and landscape additions as per comments	GS	JH
B	04/10/2021	Site access and permitted path amended as per comments	GS	JH
C	07/11/2021	Contours added	GS	JH
D	16/11/2021	Substation relocated and redline boundary updated. Minor amendments as per comments	JH	AS
E	18/11/2021	Redline boundary update	JH	AS
F	23/11/2021	Redline boundary update	JH	AS

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**CLIENT:** ERSUN (WESTSIDE SPV) LTD

**PROJECT:** WESTSIDE SOLAR

**TITLE:** MASTERPLAN

Status: PLANNING	Drawn: GS	Checked: JH
Scale: 1:2,000@A1	Date: 20.07.21	Approved: GM

Drawing Number: 3352\_L\_GA\_01



## **APPENDIX B: LEGAL AND PLANNING CONTEXT**

**APPENDIX B: LEGAL AND PLANNING CONTEXT**

<b>Protected Sites (European)</b>	
Special Areas of Conservation (SACs)	SACs are designated under The Conservation of Habitats and Species Regulations 2017 as amended, which implements The European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC (the 'Habitats Directive', EEC, 1992). Lists of candidate SACs (cSACs) have been submitted to the European Commission for approval. Both possible SACs (pSACs) and cSACs are treated by the planning system as if fully designated.
SPA	SPAs are classified in accordance with the European Community Directive on the Conservation of Wild Birds (79/409/EEC) (the 'Birds Directive', EEC, 1979). Under this Directive, the UK Government must also take special measures to conserve the habitat of species listed in Annex I of the Directive and all migratory species. The provisions of the Birds Directive are implemented in England through the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations (2010).
Ramsar Sites	The Ramsar Convention (UNESCO, 1987) requires signatory states to protect wetlands that are of international importance, particularly as waterfowl habitats.
<b>Protected Sites (National)</b>	
Local Nature Reserves	Local Nature Reserves are designated under Section 21 of The National Parks and Access to the Countryside Act 1949 (HMSO, 1949) by principal local authorities. The declaring local authority must have a legal interest in the land concerned. Local Nature reserves are designated for people and wildlife. They are places with wildlife or geological features of special interest locally and that give people special opportunities to study and learn about them or simply enjoy them and have contact with nature.
National Nature Reserves	National Nature Reserves are designated under Section 21 of the <b>National Parks and Access to the Countryside Act 1949</b> (HMSO, 1949) by the statutory authority. They are usually owned and managed by the statutory authority. National Nature Reserves are designated for the habitats that they support.
Sites of Special Scientific Interest (SSSIs)	<p>The Wildlife and Countryside Act 1981 (as amended 1991 and varied 1998) (HMSO, 1981, 1991, 1998) requires Natural England, the Government body with authority for nature conservation in England, to designate areas which make a significant contribution to a national network of sites of nature conservation value as SSSIs.</p> <p>The Countryside and Rights of Way Act 2000 (HMSO, 2000) came into force in full on 30 January 2001. The Act is in five parts. Part III relates to Nature Conservation and amends existing legislation (i.e., the Wildlife and Countryside Act 1981) through improved protection and management of SSSIs, improved legal protection for threatened species and the provision of a statutory basis for biodiversity conservation.</p>
<b>Non-Statutory Sites</b>	
Local Wildlife Sites; County Wildlife Sites;	The majority of Local Authorities have a system of 'second tier' sites which do not wholly fulfil SSSI designation criteria, but which are, nonetheless, of local or regional value. The policies, encouraged by

Sites of Nature Conservation Interest	Government advice, recognise that protection should be extended beyond the statutory sites to include the best examples of wildlife habitats, populations of rare species and geological features remaining in the area and are particularly valuable in supplementing and supporting the national framework for SSSIs.
<b>Protected Species (European)</b>	
Bats	All British bats and their roosts are fully protected under international wildlife law against adverse effects including disturbance. Under the terms of the Bonn Convention, which encompasses the Agreement of the Conservation of Bats in Europe, there is a fundamental obligation to protect from damage or disturbance, sites which are important for the conservation status of bats. Such sites include those bats use for shelter or protection and important foraging areas.
Birds	In Britain all wild birds are granted legal protection under the EC Birds Directive and the Wildlife & Countryside Act 1981 (as amended). This legislation protects the birds, their eggs and nests whilst being built or in use.  Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. In the UK this is implemented through various national wildlife protection policies.
Dormouse	The dormouse is protected under Schedule 2 of The Conservation of Habitats and Species Regulations 2017 as amended and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Taken together, the Regulations and Act make it illegal to intentionally or deliberately kill, injure or capture dormice; deliberately disturb dormice and damage or destroy dormouse breeding sites or resting places.
Great Crested Newt	The great crested newt is fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017 as amended. The legislation protects the newts and their places of shelter or protection, which may extend 500m from the breeding pond.
Invertebrates	Under The Conservation of Habitats and Species Regulations 2017 as amended, invertebrate species listed on Schedule 2 it is an offence to deliberately capture or kill, disturb, take or destroy eggs of such a species or to damage or destroy the breeding site or resting place of such an animal.
Plants	Certain plant species are listed under Annex IVb of the Habitats Directive under which it is an offence to deliberately pick, collect, cut, uproot or destroy such a plant.  Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild flora species specified in Appendix 1. In the UK this is implemented through various national wildlife protection policies.
<b>Protected Species (National)</b>	
Badger	Badgers are protected under the Protection of Badgers Act 1992. This Act makes it illegal to wilfully kill, injure or take any badger, or attempt to do so and it is an offence to intentionally or recklessly

	damage, destroy or obstruct access to any part of a badger sett or disturb a badger when it is occupying a sett.
Wild Mammals	Under the Wild Mammals (Protection) Act 1996 it is an offence to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.
Reptiles	The slow-worm ( <i>Anguis fragilis</i> ), grass snake ( <i>Natrix natrix</i> ), adder ( <i>Vipera berus</i> ) and common lizard ( <i>Lacerta vivipara</i> ) are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) in respect of section 9(1) and 9(5) only. Under section 9(1) it is an offence to knowingly kill or injure a reptile. Section 9(5) refers to sale and trade.
Birds	In Britain all wild birds are granted legal protection under the Wildlife & Countryside Act 1981 (as amended) and the EC Birds Directive. This legislation protects the birds, their eggs and nests whilst being built or in use.  Legal protection makes it an offence to intentionally kill, injure, take or have in possession any wild bird or egg. It is also an offence to intentionally damage or destroy the nest of any wild bird whilst it is being built or in use. Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are subject to special penalties and are also protected from disturbance while nesting including the disturbance of dependent young.
Water vole	The water vole ( <i>Arvicola amphibius</i> ) receives protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the Act it is an offence to intentionally kill, injure or take water voles and intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or obstruct access to any structure or place used by water voles for shelter or protection or to disturb water voles while they are using such a place.
Invertebrates	Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The invertebrates which have special protection are listed on Schedule 5 under which it is an offence to intentionally kill, injure or take these invertebrates and intentionally or recklessly damage or destroy, or obstruct access to, any structure or place used for shelter or protection or disturb any such animal while occupying such a structure or place.
Plants	Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The plants and fungi which have special protection are listed on Schedule 8 under which it is an offence to intentionally pick, uproot or destroy any plant on Schedule 8.  Five plant species are listed on the Weeds Act 1959 as injurious: common ragwort ( <i>Senecio jacobaea</i> ), broad-leaved dock ( <i>Rumex obtusifolius</i> ), curled dock ( <i>Rumex crispus</i> ), creeping thistle ( <i>Cirsium arvense</i> ) and spear thistle ( <i>Cirsium vulgare</i> ). The Act requires landowners to eliminate scheduled weeds to prevent their seeds contaminating neighbouring land. The Ragwort Control Act 2003 amends the Weed Act with respect to common ragwort.  Thirty-eight species plus all species of <i>Elodea</i> (of which there are currently three species known to have been introduced) are listed on Schedule 9 of the Wildlife and Countryside Act 1981 under which it is an offence to plant or otherwise cause to grow in the wild the scheduled species. Two are marine, thirteen aquatic and the remainder terrestrial.

Biodiversity Conservation	
Natural Environment and Rural Communities Act	<p>Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006 requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The Government has a duty to take reasonably practicable steps to further the conservation of the species and habitats that are included in lists published under Section 41.</p> <p>Biodiversity 2020: A strategy for England's wildlife and ecosystem services sets out the means by which the Government will comply with its duty under Section 41 of the NERC Act to take or promote the taking by others of steps to further the conservation of listed habitats and species, including through the continued implementation of Action Plans.</p>

### Local Planning Policy

#### ***Hereford Local Plan - Core Strategy 2015-2031***

##### *Policy LD2 – Biodiversity and geodiversity*

*Development proposals should conserve, restore and enhance the biodiversity and geodiversity assets of Herefordshire, through the:*

*1. retention and protection of nature conservation sites and habitats, and important species in accordance with their status as follows:*

*a) Development that is likely to harm sites and species of European Importance will not be permitted;*

*b) Development that would be liable to harm Sites of Special Scientific Interest or nationally protected species will only be permitted if the conservation status of their habitat or important physical features can be protected by conditions or other material considerations are sufficient to outweigh nature conservation considerations;*

*c) Development that would be liable to harm the nature conservation value of a site or species of local nature conservation interest will only be permitted if the importance of the development outweighs the local value of the site, habitat or physical feature that supports important species.*

*d) Development that will potentially reduce the coherence and effectiveness of the ecological network of sites will only be permitted where adequate compensatory measures are brought forward. 2. restoration and enhancement of existing biodiversity and geodiversity features on site and connectivity to wider ecological networks; and 3. creation of new biodiversity features and wildlife habitats. Where appropriate the council will work with developers to agree a management strategy to ensure the protection of, and prevention of adverse impacts on, biodiversity and geodiversity features.*

*The Core Strategy objectives will be delivered through supporting development proposals that add to Herefordshire's biodiversity. During the plan period Herefordshire Council will review its Biodiversity Supplementary Planning Guidance utilising in particular the*



*principles, opportunities and constraints detailed within the **Building Biodiversity into Herefordshire Council's Local Development Framework 2009**. Further areas of local Herefordshire Local Plan – Core Strategy 2011-2031 biodiversity or geodiversity importance may be designated or extended during the plan period.*

*Details of the county's biodiversity and geodiversity assets and features, some of which traverse the local authority's administrative boundaries, are listed in Appendices 8e-k and further information is held at the Herefordshire Biological Records Centre. Core areas have been identified where there are clusters of biodiversity and geodiversity features of high conservation value as detailed in the **Herefordshire Ecological Network Map 2012**. Development within and adjacent to these core areas and associated buffer zones will need to be sympathetically designed to ensure there are no adverse impacts upon them. Alongside this, Herefordshire Council will seek contributions to enhance and link such core areas.*

#### Policy LD3 – Green infrastructure

*Development proposals should protect, manage and plan for the preservation of existing and delivery of new green infrastructure, and should achieve the following objectives:*

- 1. identification and retention of existing green infrastructure corridors and linkages; including the protection of valued landscapes, trees, hedgerows, woodlands, water courses and adjoining flood plain;*
- 2. provision of on-site green infrastructure; in particular proposals will be supported where this enhances the network; and*
- 3. integration with, and connection to, the surrounding green infrastructure network.*

#### National Planning Policy Framework (NPPF)

The NPPF (MHCLG, 2021) emphasises that planning decisions should contribute to and enhance the natural and local environment by protecting and enhancing sites of biodiversity value (in a manner commensurate with their statutory status or identified quality in the development plan) and “*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*” (paragraph 170 refers).

The NPPF advises that when determining planning applications, local planning authorities should aim to protect and enhance biodiversity by applying the following principles (paragraph 175 refers):

*“a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*

*b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*

*c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons<sup>58</sup> and a suitable compensation strategy exists; and*

*d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity."*

#### National Planning Policy Guidance (NPPG)

NPPG (DCLG, 2014) will be updated in due course, where necessary, to reflect the NPPF. Current NPPG advises that information on biodiversity impacts and opportunities should inform all stages of development, from site selection and design, to include any pre-application consultation as well as the application itself. The guidance notes that:

*"An ecological survey will be necessary in advance of a planning application if the type and location of development are such that the impact on biodiversity may be significant and existing information is lacking or inadequate. Pre-application discussion can help scope whether this is the case and, if so, the survey work required" (Paragraph 016).*

The guidance also notes that:

*"Local planning authorities should only require ecological surveys where clearly justified, for example if they consider there is a reasonable likelihood of a protected species being present and affected by development. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity" (Paragraph 016).*

## **APPENDIX C: PHOTOGRAPHS**

**APPENDIX C: PHOTOGRAPHS AND TARGET NOTES**

No.	Photograph	Description
1		Arable field
2		Proposed access track
3		Pond 2

4		Arable field
5		Second proposed access track
6		Pond 3

Target notes	Description
TN 1	Confidential
TN 2	Log and grass cuttings piles
TN 3	Maize husk badger feeding sign

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TN 4	Confidential
TN 5	Confidential
TN6	Mammal tracks
TN7	Badger foraging marks
TN8	Breeze blocks surrounded by rabbit holes
TN9	One likely rabbit hole and a possible foxhole at the base of a mature willow. A pheasant carcass was present at the entrance of the potential foxhole.
TN10	Rabbit holes
TN11	Bird nest
TN12	Eaten maize cobs
TN13	Three bird nests
TN14	Rabbit warren
TN15	Piles of deadwood
TN16	Confidential
TN17	Confidential
TN18	Pile of manure
TN19	Confidential
TN20	Confidential
TN21	Confidential
TN22	Confidential
TN23	Pile of woodchips
TN24	Confidential
TN25	Confidential

## **APPENDIX D: BAT SURVEY RESULTS**

**APPENDIX D: BAT SURVEY RESULTS**

All surveys were carried out by suitably experienced ecologists. Names are available on request.

**Bat Activity Surveys**Manual Transect Surveys

Surveys were conducted in accordance with industry recognised guidance produced by the Bat Conservation Trust (Collins, 2016). Eighteen stopping points were located along both the west and east transects with all bat passes noted during a three or five-minute period at each stop. Three-minute stops were undertaken during the spring and summer transects and five-minute stops were undertaken during the autumn transect. Surveyors were equipped with broadband electronic bat detectors and recording devices for all activity surveys. Recordings were then analysed using Kaleidoscope and/or Anlook to species level where possible.

Prevailing weather conditions during the bat transect surveys undertaken to date are as follows;

Survey No.	Date	Weather Conditions	Temp. at Sunset (°C)	Wind Start 0-12	Wind End 0-12
1	27/04/2021	Light rain at the start and end of the survey.	9	1	1
2	07/07/2021	No rain	16	0-1	0
3	02/09/2021	No rain	16	2	2

The following table summarises the total number of bat registrations recorded at stopping points during the west transect surveys. The results are mapped in **Figure 8**.

Transect Stopping Point	PIPI	PIPY	NYNO	EPSE	MYO	PLAUR	RHHI	BABA
A	4	0	0	0	1	0	0	0
B	0	0	0	0	0	0	0	0
C	2	0	0	0	0	0	0	0
D	0	2	0	0	0	0	0	0
E	0	10	0	0	0	0	0	0
F	1	1	1	0	1	0	0	0
G	6	16	3	0	0	0	0	0
H	0	6	3	0	0	0	0	0
I	1	1	2	0	0	0	0	1
J	3	0	0	0	1	0	0	0
K	8	4	0	0	1	0	0	0
L	2	0	2	0	0	0	0	0
M	5	0	0	0	0	0	1	0



Transect Stopping Point	PIPI	PIPY	NYNO	EPSE	MYO	PLAUR	RHHI	BABA
N	2	1	0	0	0	0	0	0
O	2	3	0	0	0	1	0	0
P	1	0	0	1	0	0	2	0
Q	1	3	0	0	0	0	0	0
R	10	0	0	0	0	0	0	0

Key: PIPI = common pipistrelle, PIPY = soprano pipistrelle, NYNO = noctule, MYO = *Myotis sp.*, PLAUR = Brown long eared, RHHI = lesser horseshoe, BABA = western barbastelle

The following table summarises the total number of bat registrations recorded at stopping points during the east transect surveys. The results are mapped in **Figure 8**.

Transect Stopping Point	PIPI	PIPY	NYNO	EPSE	MYO
A	0	0	0	0	0
B	3	2	0	0	0
C	2	10	0	0	2
D	2	4	3	0	24
E	1	0	0	2	0
F	2	4	0	3	0
G	5	86	6	0	3
H	3	60	0	0	9
I	3	2	1	0	2
J	7	46	0	0	0
K	37	8	0	0	1
L	0	2	0	0	0
M	15	5	0	0	0
N	6	3	3	0	0
O	10	12	0	0	0
P	0	1	2	0	0
Q	7	4	0	0	0
R	0	2	0	0	0

Key: PIPI = common pipistrelle, PIPY = soprano pipistrelle, NYNO = noctule, MYO = *Myotis sp.*

### Automated Detector Survey

The manual transect surveys were supplemented by a minimum of 5 nights of full spectrum static bat detector recording per month. When equipment failures occurred the data, set was supplemented with extra night's recordings from other months. The automated surveys were

programmed to start 30 minutes before sunset and to end 30 minutes after sunrise. The locations of the static bat detectors and survey results are presented on **Figure 9**.

Prevailing weather conditions during the automated detector surveys undertaken are as follows:

Deployment Month	Period of Deployment	Date	Temp. at Sunset	Overnight Weather Conditions	
				Rainfall	Max. Wind Speed (m/s) <sup>7</sup>
April Deployment (2 detectors deployed)	5 nights	15/04/2021	8	No rain	2.2
		16/04/2021	8	No rain	1.3
		17/04/2021	9	No rain	2.2
		18/04/2021	11	No rain	2.7
		19/04/2021	11	No rain	0.9
July Deployment (2 detectors)	One for 5 nights and the other for 6 nights	20/07/2021	24	No rain	2.2
		21/07/2021	24	No rain	0.9
		22/07/2021	24	No rain	0.9
		23/07/2021	19	Rain showers at 4am	4.5
		24/07/2021	20	No rain	3.1
		25/07/2021	19	No rain	1.3
September Deployment (2 detectors)	5 nights (1 detector only recorded for 4 nights as the memory cards reached capacity)	02/09/2021	17	No rain	2.2
		03/09/2021	16	No rain	3.1
		04/09/2021	14	No rain	4.5
		05/09/2021	13	Rain showers at 2am	3.1
		06/09/2021	15	No rain	2.2

## Results

Month	BABA	EPSE	MYO	NYLE	NYNO	PINA	PIPI	PIPY	PLAUR	RHHI
April A	0	0	3	0	63	0	65	54	5	0
April B	1	0	4	0	45	1	204	115	11	0
July A	2	0	33	5	82	0	66	238	1	1
July B	11	1	280	0	22	8	197	447	1	3
September A	57	0	192	0	20	1	225	1524	5	7

<sup>7</sup> Slack and Tinsley (2015) found a reduction in bat activity at wind speeds of 5.4m/s and greater (Collins, 2016).

---

September B	1	0	34	1	29	0	337	975	0	2
----------------	---	---	----	---	----	---	-----	-----	---	---

Key: BABA = Barbastelle, EPSE = Serotine, MYO = *Myotis* sp., NYLE = Leisler's, NYNO = Noctule, PINA = Nathusius pipistrelle, PIPI = common pipistrelle, PIPY = soprano pipistrelle, PLAUR = Brown long eared, RHHI = lesser horseshoe.

## **APPENDIX E: GCN SURVEY RESULTS**

## APPENDIX E: GCN SURVEY RESULTS

### Population Class Assessment

#### Field Survey Technique

Waterbodies identified as positive eDNA result were surveyed for population class assessments between May and June 2021. Temperatures during the surveys were optimal for bottle trapping methods, i.e., >5°C.

Great crested newt surveys were undertaken in accordance with the Great Crested Newt Mitigation Guidelines (English Nature, 2001) and Herpetofauna Workers' Manual (Gent and Gibson, 2003). All surveys were carried out by an appropriately licensed surveyor. Presence/absence surveys require suitable weather conditions and four visits to each location during mid-March to mid-June with at least two of these visits during mid-April to mid-May. Three survey techniques were used per visit where possible, which included the following methods:

- Bottle trapping - bottle traps (made from 2-litre plastic bottles) were set out around the edge of the waterbodies and left overnight at a density of one trap per 2m of bank at locations where the bank was accessible.
- Egg search - any live or dead submerged vegetation that was within reach from the waterbody margin, especially folded leaves, were examined for newt eggs.
- Torch survey - the waterbodies were searched for great crested newt at night by shining a powerful 1,000,000 candlepower torch around the pond margins to reveal any newts present.
- Netting - a perimeter walk of the waterbody margins was undertaken and a long-handled dip net was used to sample the area around the pond edge where access to open areas of water was possible.

Prevailing weather conditions during the six great crested newt surveys undertaken were

Survey No.	Date	Surveyors	Temp. (°C)	Wind Start 0-12	Cloud Cover %	Rain Y/N
1pm	18/05/2021	NH (GCN LW) BHR	14	2	100	N
1am	19/05/2021	NH (GCN LW) BHR	11	1	100	N
2pm	19/05/2021	SA (GCN LW) IM	15	1	5	N
2am	20/05/2021	SA (GCN LW) IM	13	1	25	N
3pm	24/05/2021	SA (GCN LW) NH (GCN LW)	12	1	40	N
3am	25/05/2021	SA (GCN LW) NH (GCN LW)	11.5	0	10	N
4pm	02/06/2021	EL (acred GCN) BHR	16	1	80	N
4am	03/06/2021	EL (acred GCN) BHR	14	0	50	N
5pm	09/06/2021	NH (GCN LW) EBH	16.5	1	0	N
5am	10/09/2021	NH (GCN LW) EBH	14	1	15	N
6pm	17/06/2021	NH (GCN LW) EBH	15	1	80	N
6am	18/06/2021	SA (GCN LW) EBH	13	1	100	N

## Survey Results

Survey No.	Survey methods	Results	GCN peak count*
<b>Pond 1</b>			
1	Torch, traps 22, netted, no egg search	GCN x 3 male (torched)	3
2	Torch, traps 22, netted, no egg search	none	0
3	Torch, traps 22, netted, no egg search	GCN 3 male (torched) GCN female x1 (torched)	4
4	Torch, traps 22, netted, no egg search	GCN x 1 adult (torched), GCN x1 male (trapped), GCN x2 female (trapped)	3
5	Torch, traps 22, netted, no egg search	GCN x 1 male (torched)m GCN x 1 female (torched), GCN x 1 male (trapped)	2
6	Torch, traps 22, netted, no egg search	GCN x 1 male (trapped)	1
<b>Pond 2</b>			
1	Torch, traps 22, netted, no egg search	0	0
2	Torch, traps 22, netted, no egg search	0	0
3	Torch, traps 22, netted, no egg search	0	0
4	Torch, traps 22, netted, no egg search	GCN x 2 male (trapped) and GCN x 1 female (trapped)	3
5	Torch, traps 22, netted, no egg search	0	0
6	Torch, traps 22, netted, no egg search	2 x efts palmate	0
<b>Pond 4</b>			
1	Torch, traps 35, netted, no egg search	GCN M x1 GCN F x2 (torched), GCN F x 1 (trapped)	3
2	Torch, traps 35, netted, no egg search	GCN M x 4 and GCN F x 3 (trapped)	7
3	Torch, traps 35, netted, no egg search	GCN F x 1 (torched), GCN M x 1 and GCN F x 1 (trapped)	2
4	Torch, traps 35, netted, no egg search	GCN F x 5 and GCN M x 5 (trapped), GCN M x 1 and GCN F x 1 (netted)	10
5	Torch, traps 35, netted, no egg search	GCN M x 4 and GCN F x 3 (torched) and GCN M x 1 and GCN F x 1 (trapped)	7
6	Torch, traps 35, netted, no egg search	2 eft GCN trapped	0
<b>Pond 6</b>			
1	Torch, traps 20, netted, no egg search	0	0

2	Torch, traps 20, netted, no egg search	0	0
3	Torch, traps 20, netted, no egg search	0	0
4	Torch, traps 20, netted, no egg search	0	0
5	Torch, traps 20, netted, no egg search	0	0
6	Torch, traps 20, netted, no egg search	0	0

\* Only bottle-trapping and torch survey are considered suitable methods for assessing population size class. Peak count is the maximum number of adult newts seen on one visit using one survey method.

### Population Class Assessment

If great crested newts are present, a population size-class assessment may be required in order to devise and implement a mitigation strategy. The Great Crested Newt Mitigation Guidelines (English Nature, 2001) state that population size class assessment surveys should be undertaken over six visits in suitable weather conditions from mid-March to mid-June, with at least three of these visits during mid-April to mid-May.

The maximum adult count per waterbody per night gained through torch survey or bottle trapping is noted. For waterbodies where there is reasonable certainty of regular interchange of animals (waterbodies within 250 m and with no barriers to dispersal), counts can be summed across waterbodies.

Populations are classed as:

- Small - for maximum counts to 10 individuals;
- Medium - for maximum counts between 11 and 100; and
- Large - for maximum counts over 100.

## **APPENDIX F: EDNA GCN RESULTS**



Folio No: E9642  
 Report No: 1  
 Purchase Order: 3352  
 Client: THE LANDMARK PRACTICE  
 Contact: Edward Lim

## TECHNICAL REPORT

### ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (*TRITURUS CRISTATUS*)

#### SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

#### RESULTS

**Date sample received at Laboratory:** 25/04/2021  
**Date Reported:** 07/05/2021  
**Matters Affecting Results:** None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
0307	WESTHIDE DITCH 1	50579814479 7	Pass	Pass	Pass	Negative	0
0308	WESTHIDE POND 3	50576354461 6	Pass	Pass	Pass	Negative	0
0309	WESTHIDE POND 4	50578774475 8	Pass	Pass	Pass	Positive	4
0310	WESTHIDE POND 15	50572894457 2	Pass	Pass	Pass	Negative	0
0311	WESTHIDE POND 1	50575684403 6	Pass	Pass	Pass	Positive	12
0312	WESTHIDE DITCH 2	50582164483 4	Pass	Pass	Pass	Negative	0
0314	WESTHIDE POND 2	50574414447 6	Pass	Pass	Pass	Positive	3



0315	WESTHIDE POND 6	50573984489 1	Pass	Pass	Pass	Positive	1
0316	WESTHIDE POND 5	50572464463 6	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: [ForensicEcology@surescreen.com](mailto:ForensicEcology@surescreen.com)

**Reported by:** Chris Troth

**Approved by:** Chris Troth

**METHODOLOGY**

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 ‘Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.’ (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England’s proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

**INTERPRETATION OF RESULTS**

- SIC:**            **Sample Integrity Check** [Pass/Fail]  
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
  
- DC:**            **Degradation Check** [Pass/Fail]  
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
  
- IC:**            **Inhibition Check** [Pass/Fail]  
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.



**Result:****Presence of GCN eDNA** [Positive/Negative/Inconclusive]

**Positive:** GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.

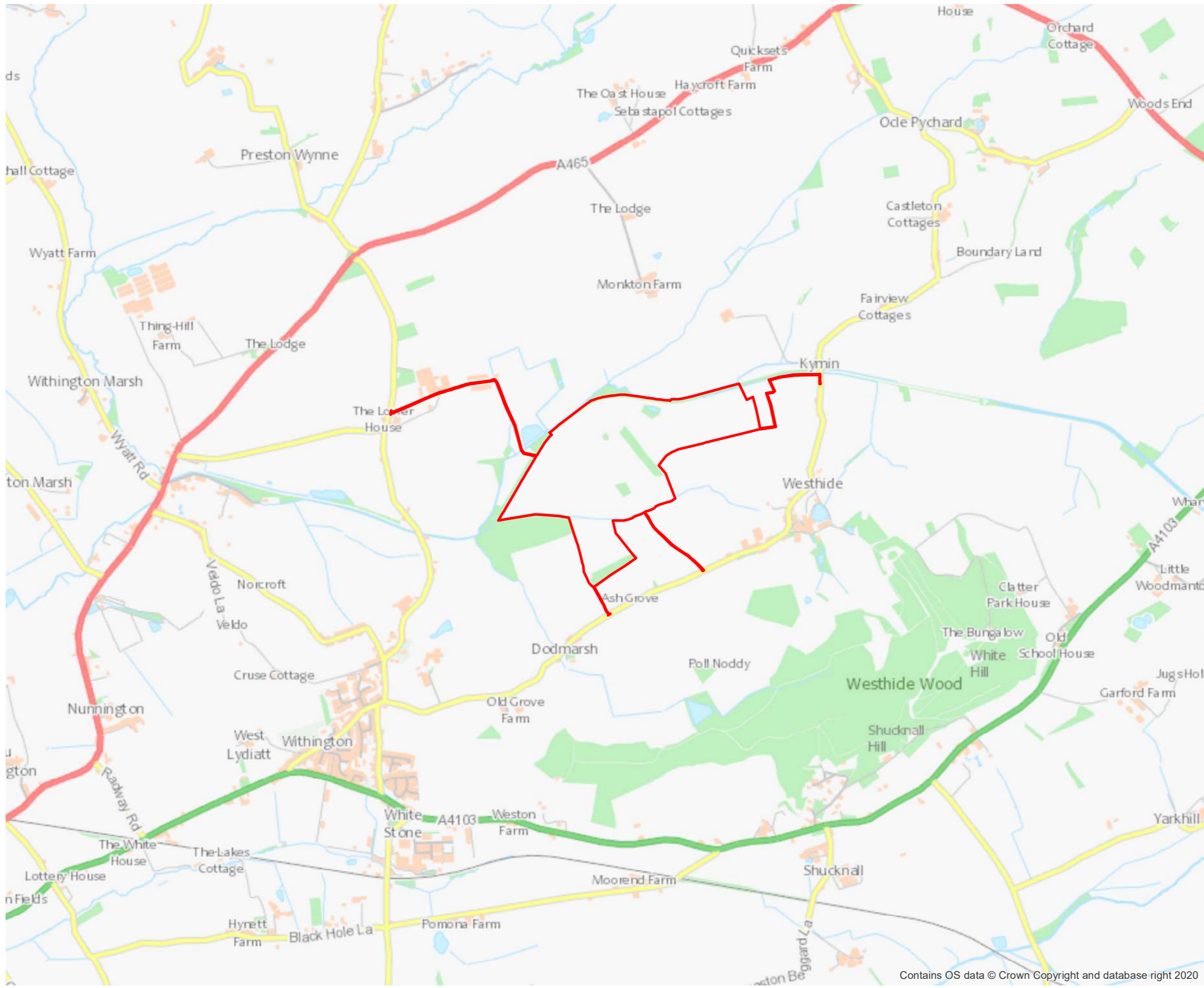
**Positive Replicates:** Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.

**Negative:** GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

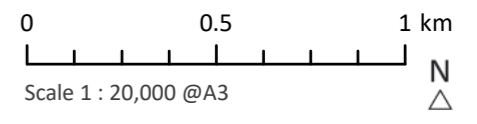


## FIGURES

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Legend:  
[Red line symbol] Site boundary



WESTHIDE SOLAR

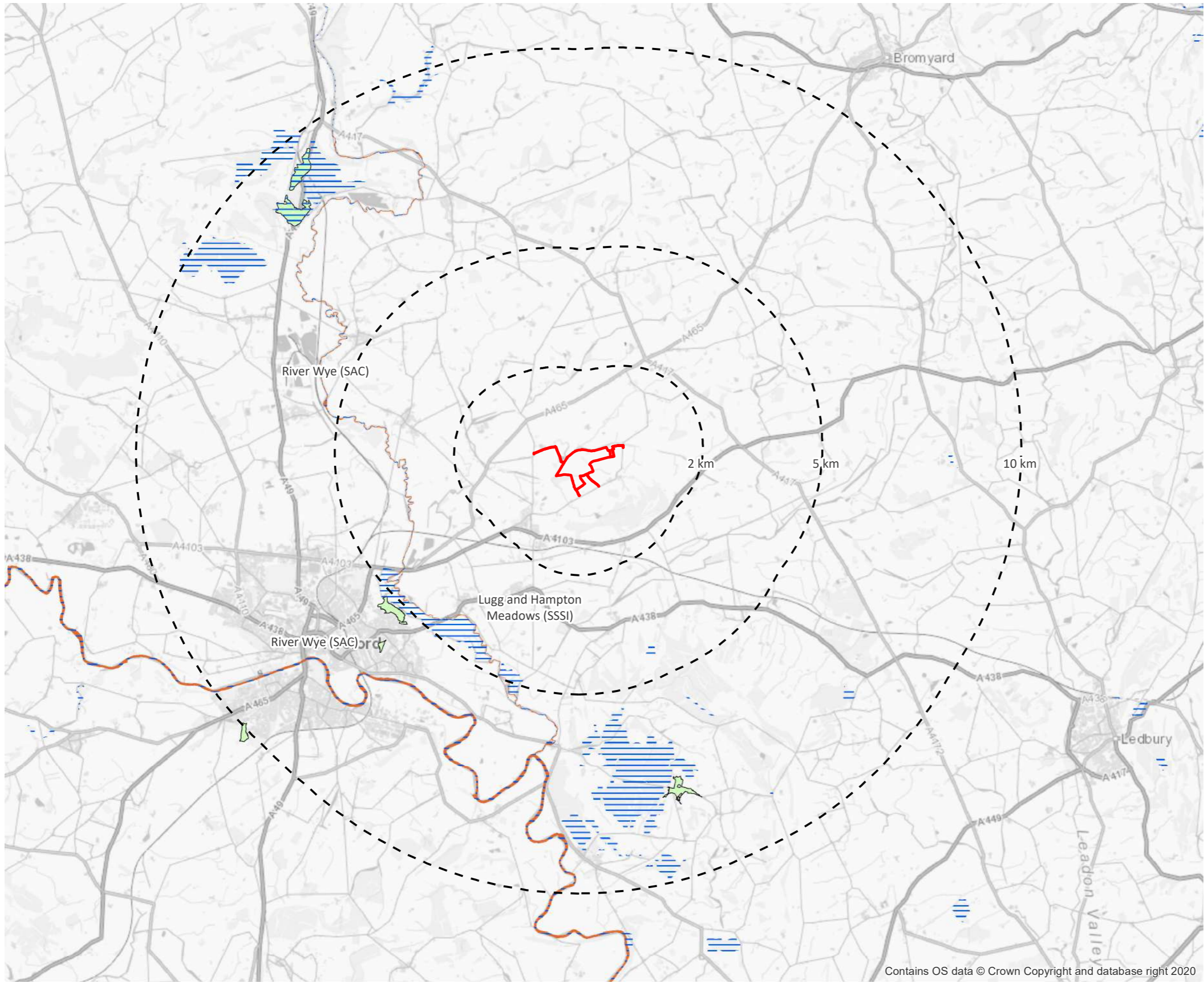
FIGURE 1  
Site location

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www.thelandmarkpractice.com

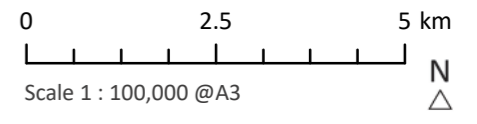
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Legend:

-  Site boundary
-  2km, 5km and 10km radial extents
-  Special Area of Conservation (SAC)
-  Site of Special Scientific Interest (SSSI)
-  Local Nature Reserve (LNR)



WESTHIDE SOLAR

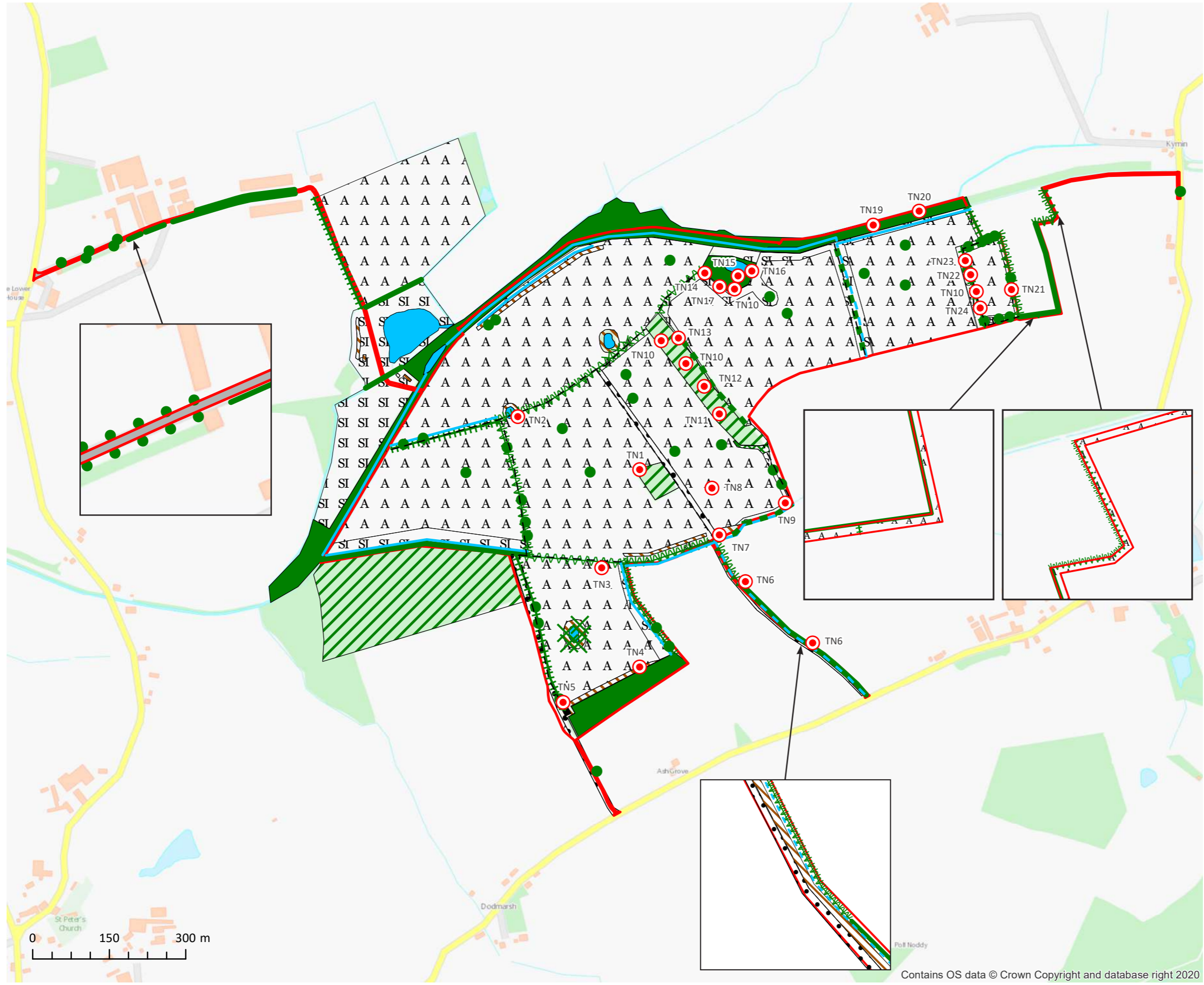
FIGURE 2  
Statutory Designated Wildlife Sites

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Drawn: EL Checked: SA Date: 30 Nov 21





- Legend:
- Site boundary
  - Building
  - Scattered broadleaved trees
  - Scattered scrub
  - Poor semi-improved grassland
  - Semi-natural broadleaved woodland
  - Broadleaved plantation woodland
  - Dense continuous scrub
  - Tall ruderal
  - Arable
  - Standing water
  - Species-poor defunct hedge
  - Species-poor intact hedge
  - Species-rich defunct hedge
  - Species-rich intact hedge
  - Species-rich hedge with trees
  - Species-poor hedge with trees
  - Dry ditch
  - Running water
  - Target note (TN)
  - Bare ground
  - Hardstanding

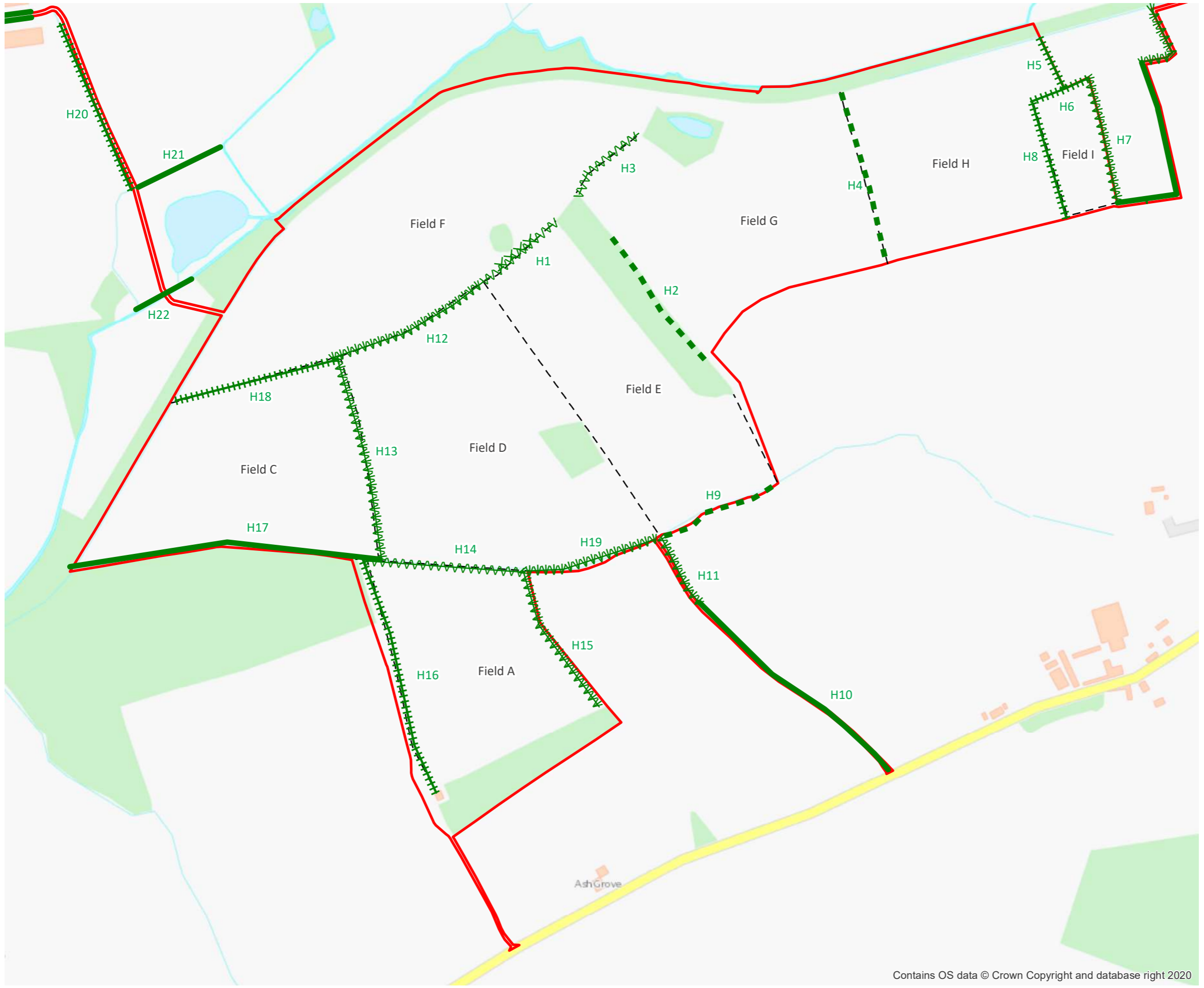
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FIGURE 3  
Phase 1 Habitat Survey

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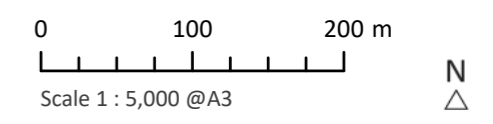
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Drawn: EL Checked: SA Date: 30 Nov 21



- Legend:
- Site boundary
  - Field boundary
  - Hedgerow number
  - Species-poor defunct hedge
  - Species-poor intact hedge
  - Species-rich defunct hedge
  - Species-rich intact hedge
  - Species-rich hedge with trees
  - Species-poor hedge with trees

N.B. Changes to the site boundary mean that H9 and H10 are no longer present within the site. They are therefore not included here.



WESTHIDE SOLAR

FIGURE 4  
Field and Hedgerow References

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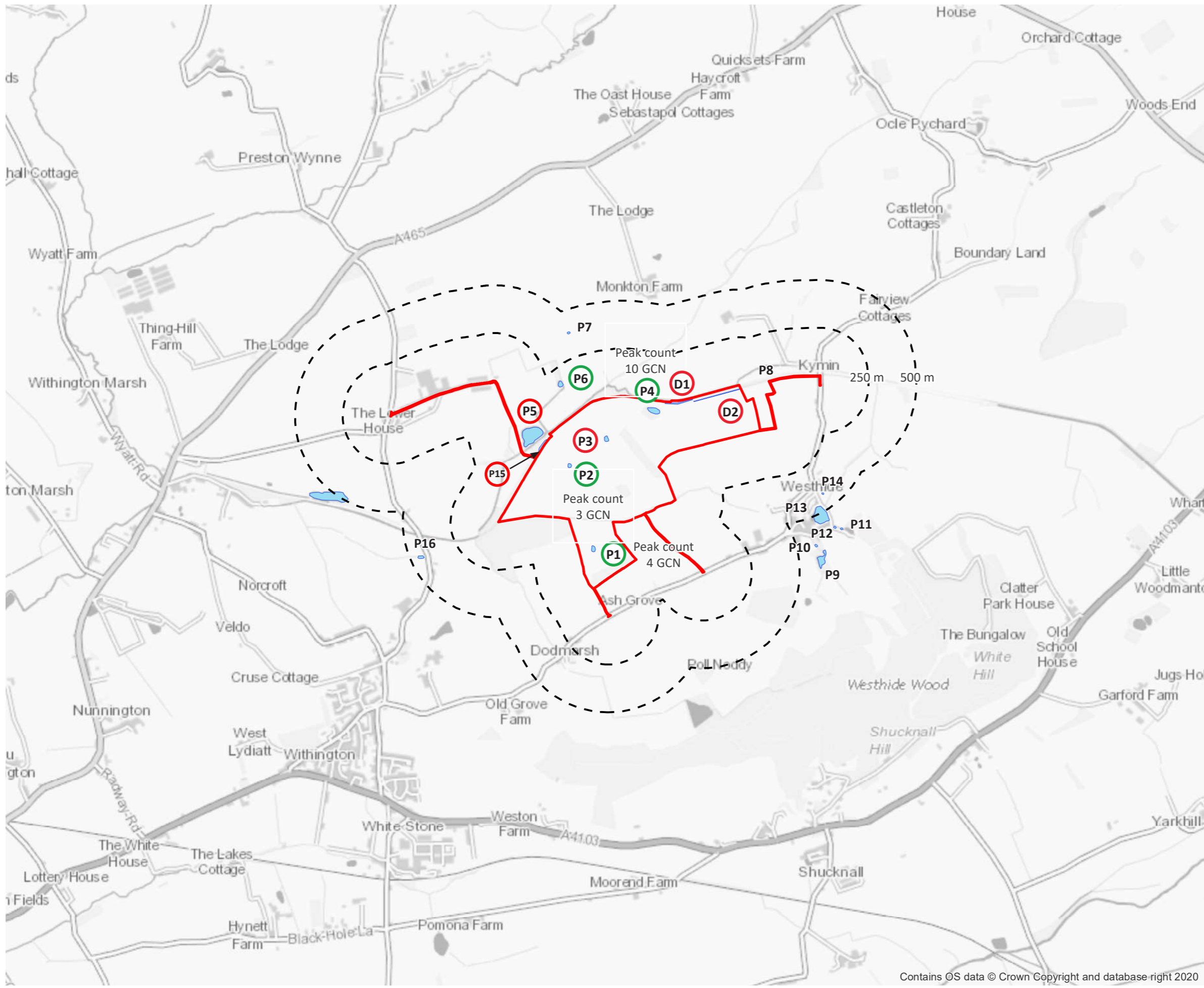
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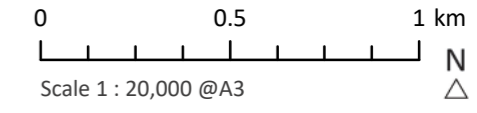


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Legend:

- Site boundary
- Waterbody
- P1 Pond number
- D1 Ditch number
- Positive
- Negative
- 250m and 500m radial extents



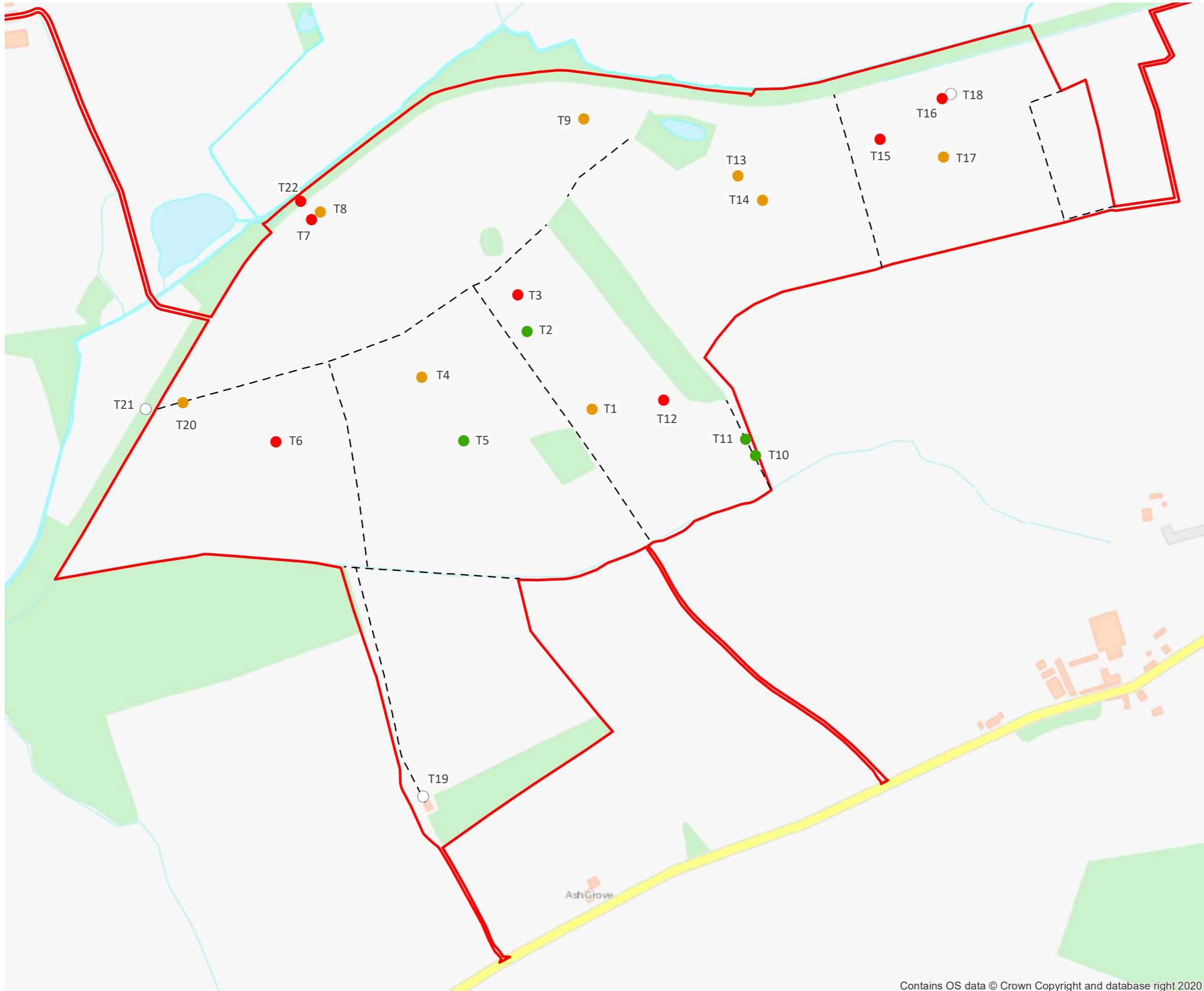
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FIGURE 5  
GCN survey







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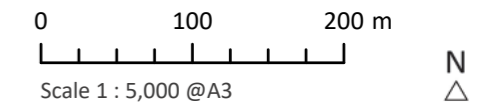
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Legend:

-  Site boundary
-  T1 Tree number
-  Negligible potential
-  Low potential
-  Moderate potential
-  High potential



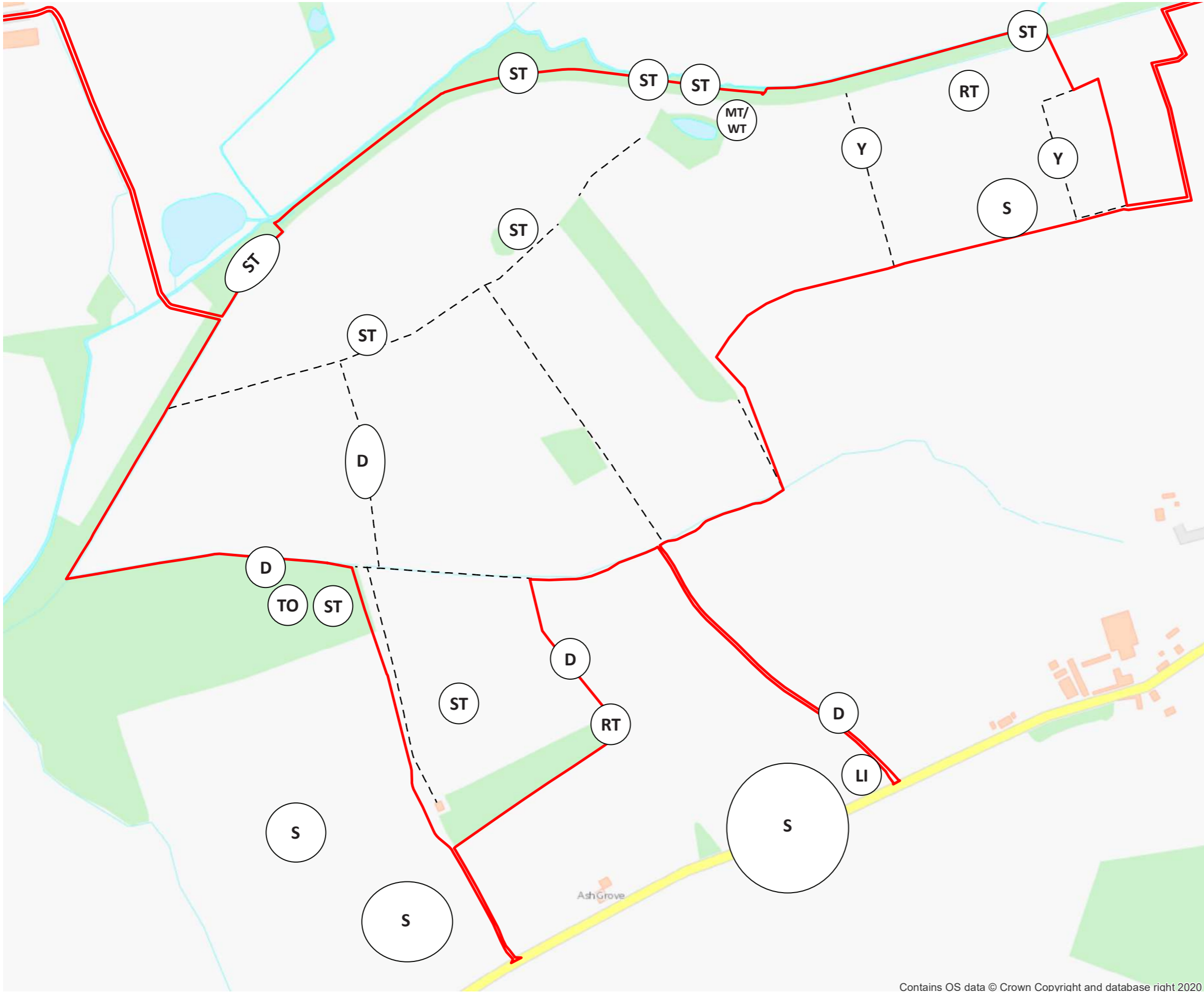
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FIGURE 6  
Preliminary Roost Assessment (Trees within fields)

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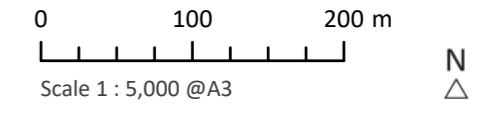
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Legend:

- Site boundary
- S Skylark territories
- Y Yellowhammer territories
- ST Song thrush territories
- D Dunnock territories
- LI Linnet territories
- RT Common redstart territories
- MT/WT Marsh tit/willow tit territories
- TO Tawny owl territories



WESTHIDE SOLAR

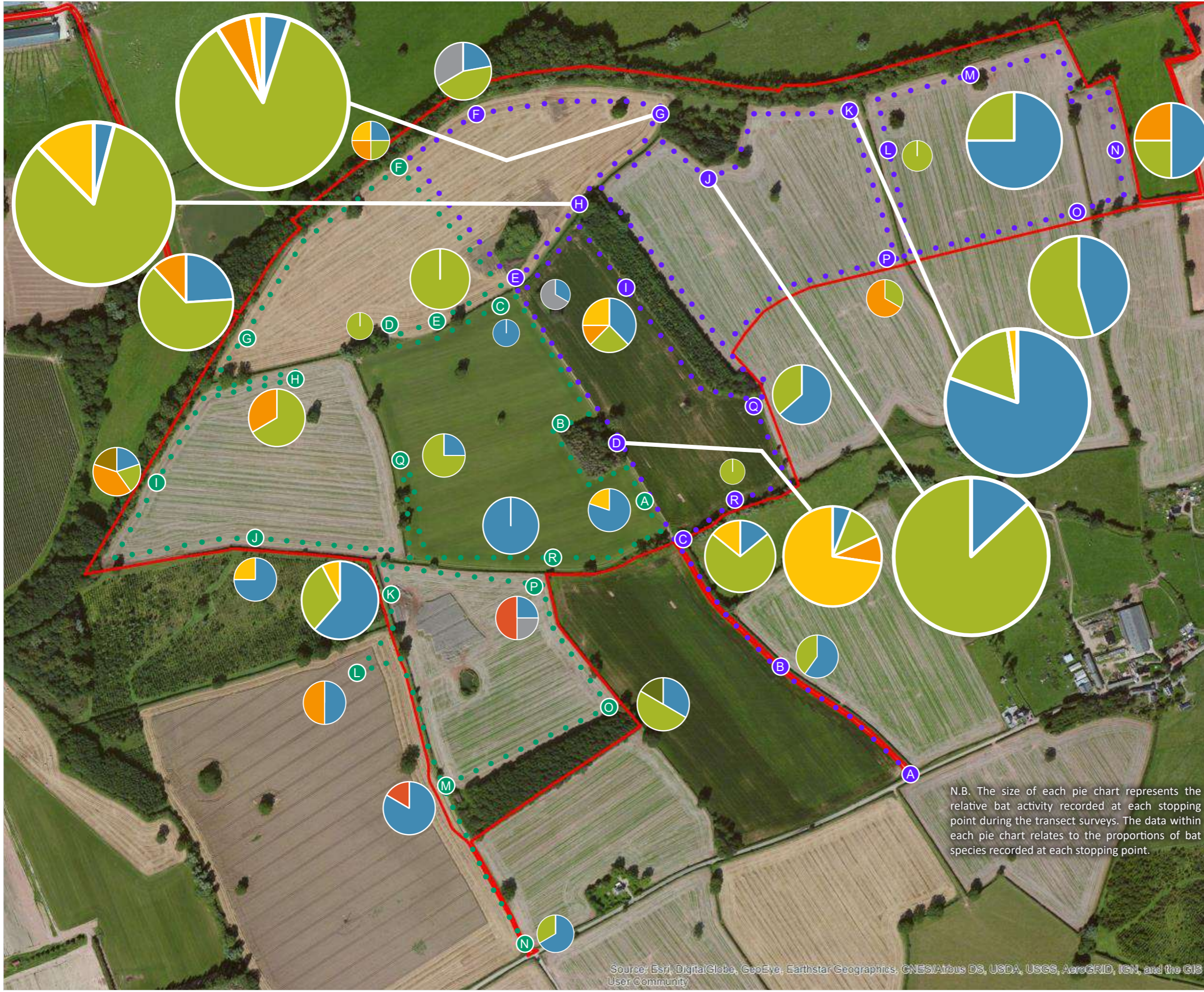
**FIGURE 7**  
Breeding bird surveys - species of conservation concern

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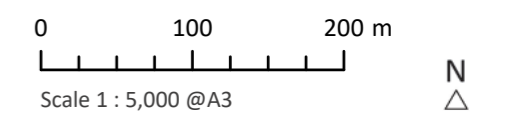
Drawn: EL Checked: SA Date: 30 Nov 21





- Legend:**
- Site boundary
  - Common pipstrelle (*Pipistrellus pipistrellus*)
  - Soprano pipstrelle (*Pipistrellus pygmaeus*)
  - Noctule bat (*Nyctalus noctula*)
  - Serotine bat (*Eptesicus serotinus*)
  - Myotis sp. (*Myotis sp.*)
  - Lesser horseshoe bat (*Rhinolophus hipposideros*)
  - Brown long-eared bat (*Plecotus auritus*)
  - Western barbastelle (*Barbastella barbastellus*)

No#	Eastern Transect	Western Transect
A	SO 58138 43924	SO 57808 44232
B	SO 57984 44047	SO 57691 44375
C	SO 57827 44228	SO 57616 44520
D	SO 57755 44348	SO 57426 44499
E	SO 57622 44555	SO 57546 44524
F	SO 57578 44777	SO 57458 44691
G	SO 57808 44760	SO 57260 44452
H	SO 57712 44658	SO 57318 44427
I	SO 57793 44516	SO 57170 44306
J	SO 57879 44701	SO 57308 44217
K	SO 58066 44778	SO 57459 44143
L	SO 58110 44709	SO 57435 44032
M	SO 58276 44845	SO 57543 43873
N	SO 58416 44719	SO 57645 43694
O	SO 58362 44644	SO 57737 44008
P	SO 58108 44589	SO 57652 44155
Q	SO 57949 44386	SO 57474 44331
R	SO 57938 44279	SO 57622 44197



WESTHIDE SOLAR

**FIGURE 8**  
Bat activity survey results

**THE Landmark PRACTICE**

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N.B. The size of each pie chart represents the relative bat activity recorded at each stopping point during the transect surveys. The data within each pie chart relates to the proportions of bat species recorded at each stopping point.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

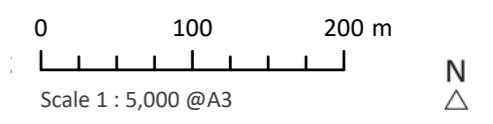




**Legend:**

- Site boundary
- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Noctule bat (*Nyctalus noctula*)
- Serotine bat (*Eptesicus serotinus*)
- Myotis sp. (*Myotis sp.*)
- Lesser horseshoe bat (*Rhinolophus hipposideros*)
- Brown long-eared bat (*Plecotus auritus*)
- Western barbastelle (*Barbastella barbastellus*)
- Leisler's bat (*Nyctalus leisleri*)
- Nathusius' pipistrelle (*Pipistrellus nathusii*)

Month	Grid Reference
APRIL A	SO 57594 43917
APRIL B	SO 57865 44710
JULY A	SO 57134 44273
JULY B	SO 57936 44416
SEP A	SO 58421 44749
SEP B	SO 57485 44257



WESTHIDE SOLAR

**FIGURE 9**  
Bat static survey results



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N.B. The size of each pie chart represents the relative bat activity recorded at each static location. The data within each pie chart relates to the proportions of bat species recorded at each location.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community