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**Priory Farm Solar Array**  
on behalf of Axis PED  
Ecological Assessment Report



Document Control				
Project Name:		Priory Farm Solar Array		
Project Number:		AxisL-043-1480		
Report Title		Ecological Assessment Report		
Issue	Date	Notes	Prepared	Reviewed
V1.0	07/10/2021	Draft for client review	K.Ward <i>MSc</i>	J. Stevens BSc (Hons)
V1.1	20/10/2021	First issue	K.Ward <i>MSc</i>	J. Stevens BSc (Hons)
V1.2	15/11/2021	Updated BNG figures	-	J. Stevens BSc (Hons)
V1.3	13/12/2021	Minor updates	-	J. Stevens BSc (Hons)

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# 1 INTRODUCTION

## 1.1 Background

- 1.1.1 This report has been prepared by Avian Ecology Ltd. on behalf of Axis PED and provides an assessment of ecological effects in relation to a proposed solar farm and associated infrastructure on land to the north and east of Great Wymondley, Hertfordshire.
- 1.1.2 The scheme will involve the installation of photovoltaic solar panels mounted on support frames, along with infrastructure such as cabling, inverter and transformer stations, battery storage containers and equipment storage. Security fencing and CCTV will also be installed, as well as means of access. The proposals also include habitat creation works including the creation of new hedgerows and enhancement of existing hedgerows, woodland screen planting and grassland creation.

## 1.2 Site Overview

- 1.2.1 The site is located east of Great Wymondley, Hertfordshire at approximate site central grid reference TL 22483 28448. The site is split into a north parcel and a southern parcel, bisected by Graveley Lane. Current land use of both parcels is cultivated arable land with fields often bounded by a mixture of defunct and intact, species rich and species poor hedgerows. The southern parcel is bounded by the A1(M) motorway to the east. The northern parcel also has two blocks of mixed woodland adjacent the Site.
- 1.2.2 The grid connection cable route will predominantly follow local roads along Graveley Lane, Priory Lane, Stevenage Road, Blakemore End Road and Sperberry Hill, before joining Wymondley Transforming Station from the south. Due to a lack of ecological impacts along areas of road, the grid connection route is considered only in relation to the stretch between Sperberry Hill and Wymondley Transforming Station.
- 1.2.3 Surrounding land use is predominantly agricultural with the villages of Great Wymondley and Little Wymondley lying to the east and south east, respectively. The larger settlements of Hitchin, Stevenage and Letchworth Garden city lie to the north, south and west with larger expanses of rural land to the east.

## 1.3 Legislative Framework, Planning Policy and Guidance

- 1.3.1 Reference has been made to the following key pieces of legislation, planning policy and guidance listed in Table 1.1 below.

**Table 1.1: Key legislation, planning policy and guidance.**

<b>International</b>
<ul style="list-style-type: none"><li>• Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 ('the Ramsar Convention)</li><li>• Convention on the Conservation of European Wildlife and Natural Habitats 1979 ('the Bern Convention)</li><li>• UNESCO convention on the protection of the World Cultural and Natural Heritage (1972)</li></ul>
<b>National</b>
<ul style="list-style-type: none"><li>• The 'Conservation of Habitats and Species Regulations 2017 (as amended)' and 'Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. For the purposes of this report these two references are interchangeable and hereafter referred to as the 'Habitat Regulations';</li></ul>

- The Environment Act 2021;
- The Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Protection of Badgers Act 1992;
- Hedgerow Regulations 1997;
- Natural Environment and Rural Communities (NERC) Act (2006);
- The National Planning Policy Framework (2021)<sup>1</sup>;
- ‘Birds of Conservation Concern 4’ (Eaton et al., 2015)<sup>2</sup>;
- The UK Post – 2010 Biodiversity Framework<sup>3</sup>;
- The Bat Conservation Trust - Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.)<sup>4</sup>;
- BS 42020:2013 Biodiversity – Code of Practice for Planning and Development; and,
- Biodiversity Net Gain: Good practice principles for development (CIEEM, 2016<sup>5</sup>).

#### Local

- Hertfordshire Biodiversity Action Plan<sup>6</sup>

1.3.2 The ‘UK Post-2010 Biodiversity Framework’ succeeds the UK Biodiversity Action Plan (UK BAP) and ‘Conserving Biodiversity – the UK Approach’. The lists of priority species and habitats agreed under UK BAP still form the basis of much biodiversity work and are therefore considered within this report in the context of the objectives of the Biodiversity Framework. BAPs identify habitats and species of nature conservation priority on a UK (UK BAP) and Local (LBAP) scale. UK BAPs formed the basis for statutory lists of priority species and habitats in England under Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006, and so are also relevant in the context of this legislation.

1.3.3 This report is provided in accordance with the provisions of British Standard 42020:2013 Biodiversity: *Code of practice for planning and development*.

## 1.4 European Protected Species (EPS) Policies

1.4.1 European Protected Species (EPS), such as bats, great crested newts *Triturus cristatus* and otters *Lutra lutra*, receive full protection under the Habitats Regulations. This makes it an offence to:

- deliberately capture, injure or kill any EPS;
- to deliberately disturb them; and/or,
- to damage or destroy a breeding site or resting place.

<sup>1</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1005759/NPPF\\_July\\_2021.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf)

<sup>2</sup> Eaton, M., et al (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108, pp 708-746.

<sup>3</sup> <https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/>.

<sup>4</sup> Collins et al. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3<sup>rd</sup> edition, BCT: London.

<sup>5</sup> CIEEM (2016). *Biodiversity Net Gain: Good practice principles for development*. CIEEM, Winchester.

<sup>6</sup> <https://www.north-herts.gov.uk/sites/northherts-cms/files/ORD4%20Hertfordshire%20Biodiversity%20Action%20Plan.pdf>

- 1.4.2 In addition, the Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally or recklessly disturb a EPS while it is occupying a structure or place which it uses for shelter or protection, or to obstruct access to any structure or place the species uses for shelter or protection.
- 1.4.3 Natural England is the primary enforcing body of the Habitat Regulations in England and therefore responsible for implementation and compliance in England. In February 2016 Natural England published 'Wildlife licensing: comment on new policies for European protected species licence'<sup>7</sup>.and in December 2016 Natural England officially introduced the four licensing policies throughout England<sup>8</sup>.
- 1.4.4 The four policies seek to achieve better outcomes for EPS and reduce unnecessary costs, delays and uncertainty that can be inherent in the current standard EPS licensing system. The policies are summarised as follows:
- **Policy 1;** provides greater flexibility in exclusion and relocation activities, where there is investment in habitat provision;
  - **Policy 2;** provides greater flexibility in the location of compensatory habitat;
  - **Policy 3;** provides greater flexibility on exclusion measures where this will allow EPS to use temporary habitat; and,
  - **Policy 4;** provides a reduced survey effort in circumstances where the impacts of development can be confidently predicted.
- 1.4.5 The four policies have been designed to have a net benefit for EPS by improving populations overall and not just protecting individuals within development sites. Most notably Natural England now recognises that the Habitats Regulations legal framework now applies to 'local populations' of EPS and not individuals/site populations.
- 1.4.6 Where the four policies are considered relevant to the application, they are discussed within the corresponding assessment of effects sections for EPS which could potentially occur on or close to the proposed development.

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<sup>7</sup> <https://www.gov.uk/government/consultations/wildlife-licensing-comment-on-NEw-policies-for-european-protected-species-licences>.

<sup>8</sup> <https://www.gov.uk/government/news/new-licensing-policies-great-for-wildlife-great-for-business>.

## 2 METHODOLOGY

### 2.1 Desktop Study

2.1.1 A desktop study was undertaken to identify any known existing features or species of ecological importance within the study area (as defined below).

2.1.2 The desk study included a review of relevant policy and guidance and sought to identify any statutory designated sites for nature conservation through a review of the Natural England, JNCC and Multi Agency Geographic Information for the Countryside (MAGIC) websites. A 2km search radius surrounding the Site boundary was adopted for all statutory designated sites, extending to 10km for International protected sites

2.1.3 The search for statutory designated sites included the following:

- Internationally Designated Sites:
  - Special Protection Areas (SPA) and potential SPA;
  - Ramsar Wetlands of International Importance (Ramsar) and proposed Ramsar; and
  - Special Protection Areas (SAC) and possible SAC
- Nationally designated Sites:
  - Sites of Special Scientific Interest (SSSI);
  - National Nature Reserve (NNR); and
  - Local Nature Reserve (LNR)

2.1.4 The locations of statutory designated sites are provided in Figure 3

2.1.5 The MAGIC website also includes details of granted EPS licence applications. A 2km search radius around Site boundary was adopted for EPS licences.

2.1.6 Biological records data on non-statutory designated sites and records of protected and notable species was requested from Hertfordshire Ecological Records Centre (HERC). A 2km search radius was used from the Site boundaries. The locations of all non-statutory designated sites located within 2km of the Site are provided in Figure 4.

2.1.7 The Ancient Woodland Inventory was accessed through magic to determine the presence and location of ancient woodland blocks recorded on the inventory and the Woodland Trust Ancient Tree Inventory<sup>9</sup> was consulted for locations of individual ancient or veteran trees.

2.1.8 Reference was also made to Ordnance Survey maps of the wider area and online aerial images ([www.google.co.uk/maps](http://www.google.co.uk/maps)) in order to determine any features of nature conservation interest in the wider area.

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<sup>9</sup> <https://ati.woodlandtrust.org.uk/>



## 2.2 Biodiversity Net Gain Assessment

- 2.2.1 A biodiversity net gain assessment was undertaken using the Natural England Biodiversity Metric 3.0<sup>10</sup> ('the Metric'). The Metric provides a way of measuring and accounting for changes in the biodiversity value of a Site by using habitats as a proxy for biodiversity.
- 2.2.2 The biodiversity metric takes into account a range of factors when calculating the value of a habitat (measured as biodiversity units), including the habitats area (measured in hectares), its distinctiveness (its intrinsic value and rarity), condition (the quality of the habitat being assessed), and strategic significance (how ecologically valuable is the location).
- 2.2.3 For created habitats additional risk multipliers are assigned to account for the difficulty of creating a particular habitat type, its time to achieve the target condition, and where habitat creation is off site, spatial risk.
- 2.2.4 Habitat data from the extended Phase 1 Habitat survey was translated into UK Habitat Classification (UKHab) habitat types as used in the metric using the G-9 Translation Phase 1 tab, UKHab resources<sup>11</sup>, and professional judgement. Habitat areas were calculated using GIS software.
- 2.2.5 The distinctiveness of a habitat is pre-set within the Metric and cannot be changed. Habitat condition was calculated using the appropriate condition sheets as provided within the Metric Technical Supplement<sup>12</sup>. The strategic significance was determined from a review of local policy documents, and using professional judgement where it was considered the habitat provided additional ecological functions (e.g., acting as a stepping stone between other blocks of similar habitat)
- 2.2.6 Where an area or habitat is specifically covered by a local planning policy or management plan the strategic significance has been categorised as high. If a habitat has functional value but is not formally recognised in local policy the strategic significance has been categorised as medium. Where the habitat does not fall under any local policies and has limited functional value the strategic significance has been categorised as low.
- 2.2.7 Proposed landscaping was directly assigned a UKHab category, with reference to the UKHab resources and using professional judgement. The target condition of these habitats was assigned based on the likely achievable condition of the proposed habitat type, taking into account local conditions (e.g., soil nutrient levels) and proposed management.
- 2.2.8 Hedgerows are accounted for separately in the Biodiversity Metric 3.0 as these are linear habitats and therefore are measured in kilometres. Units are not directly interchangeable between area-based habitats and linear habitats such as hedgerows.

## 2.3 Field Survey

### ***Extended Phase 1 Habitat Survey***

- 2.3.1 An Extended Phase 1 habitat survey of the Site was undertaken on the 22<sup>nd</sup> June 2021 by Ms Sam Turner, a suitably qualified and experienced ecologist. The survey followed UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010) and with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM), Technical Guidance Series *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2013).

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<sup>10</sup> <http://publications.naturalengland.org.uk/publication/6049804846366720>

<sup>11</sup> [www.ukhab.org](http://www.ukhab.org)

<sup>12</sup> <http://publications.naturalengland.org.uk/publication/6049804846366720>

- 2.3.2 The survey covered land within the redline area and also incorporated a field to the south-east of the current Site; for the purposes of clarity, this additional field is referred to as the wider survey area and habitats within the redline development boundary are referred to as the Site. The extent of the Site is detailed in **Figure 1**, habitats located within the Site and wider survey area is provided in **Figure 2**.
- 2.3.3 Habitats were mapped and described using a series of 'target notes' (TNs);
- 2.3.4 The survey was extended to include the additional recording of specific features indicating the presence, or likely presence, of protected species, invasive species and other species of conservation significance.

### ***Breeding Bird Survey***

- 2.3.1 Three breeding bird surveys were undertaken in May and June 2021. All three surveys were carried out between dawn and 08:30hrs, and were carried out in conditions conducive for breeding bird surveys (avoiding heavy rain and strong winds). The survey area for the breeding bird survey was the Site with an additional 100m buffer thus including adjoining habitats for recording evidence of breeding Schedule 1<sup>13</sup> species (**Figure A5.1**).
- 2.3.2 Breeding bird surveys were undertaken by S. Nichols, who is an experienced ornithologist.
- 2.3.3 The methodology employed was based upon a scaled-down version of the British Trust for Ornithology (BTO) Common Bird Census (CBC) technique, as detailed in Gilbert *et al.* (1998<sup>14</sup>). All bird registrations were recorded on suitably scaled field maps using standard BTO species codes and behaviour notations (such as singing, carrying food, active nest). The approximate locations of bird territories within the Site were determined using standard territory mapping techniques to identify and isolate areas within which birds consistently displayed breeding behaviours (following Gilbert *et al.* 1998). The territory mapping method is based on the observation that many species during the breeding season are territorial. This is most marked in passerines where territories are often determined by conspicuous song, display and territorial disputes with neighbouring conspecifics. The expected outcome of this technique is that mapped registrations fall into clusters, approximately coinciding with territories. Records of birds just visiting the Site (e.g. gulls feeding in fields) and birds flying over the Site were also made and the records of these summarised, however these have been discounted from further analysis, given they are not breeding within the Site and are therefore not considered relevant to the assessment.
- 2.3.4 For the purposes of the assessment the breeding territories of Notable Species are mapped, given these are the most relevant species to the assessment. Notable Species consist of Birds of Conservation Concern 4 (BoCC4 Amber and Red List Species (Eaton *et al.* 2015<sup>15</sup>), species listed in section 41 of NERC Act (2006), Annex 1<sup>16</sup>/Schedule 1 raptors and owls and species listed on Hertfordshire Local Biodiversity Action Plan<sup>17</sup> (LBAP) species priority lists.
- 2.3.5 Details of the surveys are presented in **Table 2.1**.

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<sup>13</sup> Species listed as Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and afforded additional protection.

<sup>14</sup> Gilbert, G., Gibbons, D.W & Evans, J. (1998) *Bird monitoring methods*. A manual of techniques for key UK species. RSPB.

<sup>15</sup> Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D. & Gregory, R.D (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 108, 708–746.

<sup>16</sup> Species listed as threatened on Annex 1 of the European Bird Directive

<sup>17</sup> [http://www.hef.org.uk/nature/biodiversity\\_vision/contents.htm](http://www.hef.org.uk/nature/biodiversity_vision/contents.htm)

**Table 2.1: Breeding bird survey effort.**

Date	Start time (24hrs)	End time (24hrs)	Sunrise times (24hrs)	Survey conditions
13/05/2021	05:00	07:30	05:10	Light winds and light rain, rain stopping after first 10 mins of survey. Good visibility. .
23/05/2021	05:30	08:30	04:56	Light winds and no rain with good visibility
04/06/2021	04:45	07:45	04:45	Calm and dry with good visibility

## 2.4 Great Crested Newt Presence/Absence Survey (eDNA)

- 2.4.1 Potential ponds which could be used by great crested newts (GCN) for breeding, if present and suitable, were identified within a 250m radius of the Site using OS and aerial mapping.
- 2.4.2 Eight ponds were originally identified on or within 250m of the Site from OS and aerial mapping. No ponds were located within the Site. Of the eight ponds originally identified two were not ponds but a stream and dry ditch, four were unable to be accessed and two were accessed for the eDNA survey.
- 2.4.3 All accessible ponds were assessed for their suitability to support GCN using the Habitat Suitability Index (HSI) Assessment methodology as developed by Oldham et al. (2000 ) and as detailed within ARG UK guidance (ARG UK, 2010 ). These ponds were also subject to eDNA survey sampling to determine the presence or likely absence of GCN, excluding ponds P18, P19 and P38A.

### *HSI*

- 2.4.4 The HSI assessment involves the measurement of ten different indices which, when combined, have been found to provide a good indication of the general suitability of ponds for great crested newts. Each of the indices is scored (between 0.01-1) using a series of graphs and figures within the guidance notes (ARG UK, 2010). These scores are then used to calculate an overall Habitat Suitability Score for each pond.
- 2.4.5 Final scores relate to pond suitability for great crested newt and range from 'poor' to 'excellent'.

### *eDNA*

- 2.4.6 Environmental DNA (eDNA) is nuclear or mitochondrial DNA that is released from an organism into the environment. Sources of eDNA include secreted faeces, mucous, gametes, shed skin and carcasses. In aquatic environments, eDNA is diluted and distributed in the water where it persists for 7–21 days, depending on the conditions (Biggs *et al.*, 2014a<sup>18</sup>). The technique for determining presence/absence of GCN uses Polymerase Chain Reaction (PCR) laboratory techniques to detect the species eDNA within water samples.
- 2.4.7 Recent research by the Department for Environment Food and Rural Affairs (Defra) Project WC1067, concludes that the sampling of waterbodies collecting eDNA appears to be a highly effective method for determining whether great crested newts are present or absent during the breeding season, even where eDNA is present in very low concentrations (Biggs *et al.*, 2014).

<sup>18</sup> Biggs J., Ewald N., Valentini A., Gaboriaud C., Griffiths R.A., Foster J., Wilkinson J., Arnett A., Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

- 2.4.8 Natural England accepts the use of environmental DNA surveys as evidence of presence or absence of GCN, provided samples are taken when newts are likely to be present (this depends on location and conditions like the weather). For licencing purposes, Natural England will only accept eDNA survey results undertaken between 15<sup>th</sup> April and 30<sup>th</sup> June.

## 2.5 Limitations of Surveys

### *Extended Phase 1*

- 2.5.1 An Extended Phase 1 habitat survey does not constitute a detailed botanical survey or faunal species list or provide a full protected species survey but, enables competent ecologists to ascertain an understanding of the ecology of the site in order to:
- Broadly identify the nature conservation value of a site and assess the significance of any potential impacts on habitat/species recorded; and/or,
  - Confirm the need and extent of any additional specific ecological surveys that are required to identify the true nature conservation value of a site (if any).
- 2.5.2 The Extended Phase 1 habitat survey visit was undertaken in June 2021, within the optimal period for this survey type.
- 2.5.3 Land along the cable route was not subject to survey. Along roads it is considered that no discernible ecological impacts would be felt as a result of the works. For the area of land surrounding Wymondley transforming station it is considered, taking into account the relatively minor works proposed and temporary nature of such works, that adequate information was able to be gathered from the desk study and that this does not constitute a significant limitation to the assessment.

### *Breeding Bird Survey*

- 2.5.4 The results of the surveys are only a snap-shot of the habitat use and activity of the bird assemblage within the Site in a given year and such usage may vary from year to year depending on wider environmental factors and agricultural land management practices.
- 2.5.5 Surveys missed the earliest part of the breeding season, which typically runs from March to September, which means that some earlier nesting species e.g. dunnock, may not have been fully recorded. However from the range of species recorded, including dunnock, this is not considered to have been a limitation to the assessment. Species favouring trees, hedgerows and woodland are not materially affected by the proposed development, which avoids these features, and the results indicate that a representative suite of species were present and recorded.
- 2.5.6 It is appreciated that factors, including the cropping regime will influence habitat use within the Site by birds. It is an assumption that the cropping regime during the survey period is typical.
- 2.5.7 Access was permitted to all parts of the Site during all surveys, so there are no limitations with this regard. Access within the 100m buffer was generally not possible, with the majority of the 100m buffer located away from roads and public rights of way (PROWs); however the observations from the Site boundary with binoculars allowed visual searches of most of the 100m buffer. As such, this is not considered to be a limiting factor.
- 2.5.8 In December 2021, following the breeding bird surveys and first revisions of this report, the Birds of Conservation Concern 5 (BOCC5)<sup>19</sup> list was published. Subsequent revisions have not been updated to

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<sup>19</sup> Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) *The Status of our bird population: The fifth birds of conservation concern in the United Kingdom*,

reflect the BOCC5 list of species as it is considered that the BOCC4 lists were valid at the time of the surveys and initial assessment, and that the subsequent publication of BOCC5 lists do not represent a limitation to the assessment.

***Great Crested Newt presence/ Absence***

- 2.5.9 Only two of the six suitable ponds present within 250m of the Site could be accessed for eDNA survey, however the two ponds surveyed were geographically distanced and in close proximity to other ponds so it is considered that great crested newt presence would have been picked up if they were indeed present in the area.

### 3 BASELINE

#### 3.1 Designated Sites for Nature Conservation

##### *Statutory Designated Sites*

- 3.1.1 A review of MAGIC identified shows the Site does not form part of, or sit adjacent to, any statutory designated site for nature conservation.
- 3.1.2 No internationally designated sites for nature conservation are located within 10km of the Site. A total of seven nationally designated statutory sites for nature conservation are located within 5km of the Site. The nearest statutory designated site is Purwell Meadows LNR located 1.4kkm west of the Site.
- 3.1.3 The Site lies within a SSSI Impact Risk Zone (IRZ); however, solar schemes are not listed on the qualifying criteria whereby the Local Planning Authority (LPA) would be required to consult with Natural England regarding potential effects.

**Table 3.1: Statutory Designated Sites for Nature Conservation**

Site Name	Designation	Distance and Direction from Site	Description
Purwell meadows	LNR	1.4km north west	Purwell Meadows is a mixture of meadow land and play areas, The River Purwell flows through the area joining the River Hiz further downstream in Walsworth, kingfishers are native to the area.
Norton common	LNR	3.8km north	Formerly arable and grazing land, Norton Common is a Local Nature Reserve in the heart of Letchworth. The woodland supports a diverse range of flora and fauna, with habitats including woodland, brooks/ springs, wildflower meadow and marshy grassland.
Weston Hill	LNR	3.9km north east	Areas of rare and valuable chalk grassland rich in wild flowers, butterflies and the woodland attracts many bird specie
Knebworth Woods	SSSI	4.3km south	It is one of the most important woodland in the north of the county lying on poorly drained acidic soils derived from underlying clay-with-flints. It is almost all ancient in origin and is ecologically diverse with rides, ponds and small areas of both acidic and neutral grassland.
Wain Wood	SSSI	4.5km south west	An ancient seat natural oak/hornbeam <i>Quercus</i> species/ <i>Carpinus betulus</i> woodland, approaching the northern limit of its natural range. The stand comprises mature pedunculate oak <i>Quercus robur</i> and sessile oak <i>Quercus petraea</i> with hornbeam standards in the south and wild cherry <i>Prunus avium</i> frequent in the north. The wood supports an interesting butterfly community, of which purple hairstreak <i>Thecla quercus</i> is a notable example.

Oughton common	LNR	4.6km north west	Oughtonhead Common is a local nature reserve with a wide variety of wildlife habitats. River Oughton flows alongside the common.
Oughtonhead Lane	SSSI	4.6km north west	This is a site of importance for fossils.

### ***Non-statutory Designated Sites***

- 3.1.4 A review of data provided by HERC shows the Site does not form part of, or sit adjacent to, any non-statutory designated site for nature conservation.
- 3.1.5 A total of 19 non-statutory designated sites for nature conservation, made up of Local Wildlife Sites (LWS), Herts and Middlesex wildlife Trust (HMWT) Nature Reserve and Regionally Important Geological Sites (RIGS) within 2km as shown on **Figure 2** and detailed in **Table 3.2**. Wymondley Transforming Station LWS, which surround the Wymondley transforming station site, is crossed by the proposed cable route which joins from Sperbery hill to the south.
- 3.1.6 The closest non-statutory designated site to the solar array site is Graveley Hall Farm LWS is located 340m east of the Site.

**Table 3.2: Non-statutory designated sites.**

Site Name	Designation	Distance and Direction from Site	Description
Wymondley Transforming Station	LWS	Crossed by cable route	Old gravel pit landscaped to form grounds of transforming station. Poor stony substrate on chalk, with very few grasses recorded. Raised banks support coarse calcareous grassland with scrub invading slowly from the edges.
Graveley Hall Farm	LWS	340m east	Buildings and environs important for protected species. Ponds important for amphibians.
Margaret's Wood & Spoil Bank Wood, Todds Green	LWS	820m south	Ancient semi-natural broadleaved woodland bisected by a railway, which supports a reasonably diverse flora. The section west of the railway is composed mainly of Hornbeam ( <i>Carpinus betulus</i> ) coppice with Pedunculate Oak ( <i>Quercus robur</i> ) and Hornbeam standards plus some Hazel ( <i>Corylus avellana</i> ) coppice.
Purewell Ninesprings	HMWT Nature Reserves, LWS	1.1kmm north west	Site with wetland complex as well as meadow and scrub habitats. A variety of wetland habits are present including springs, ditches, reedbeds, fen-meadow and wet woodland.
Purwell Railway	LWS	830m west	Railway embankment supporting species-rich neutral/calcareous grassland and scrub on the south-west facing side. A variety of grasses and herbs have been recorded.
Whitney Woods	LWS	1.2km south	Ancient semi-natural woodland surrounded by urban development. It comprises a sizeable block of Pedunculate Oak Hornbeam woodland formerly managed as coppice with standards. The stand is now Pedunculate Oak and tall

			Hornbeams with a scattered Hawthorn ( <i>Crataegus monogyna</i> )/Elder ( <i>Sambucus nigra</i> ) shrub layer.
Lucas Wood	LWS	1.3km south	Ancient semi-natural woodland of Pedunculate Oak Hornbeam coppice, with Ash ( <i>Fraxinus excelsior</i> ) also frequent. Damper in the north where there is an excavated pond and a wet ride. The woodland supports a moderately diverse flora
Purwell Meadows	LWS	1.4km north west	Old pastures along the River Purwell and its associated streams, mostly of unimproved calcareous grassland with areas of marshy ground and associated springs, some scrub, a former cress bed and secondary neutral grassland. The site supports a diversity of lower and higher plant species including a number of species uncommon or rare in Hertfordshire
Ledgeside Plantation	LWS	1.4km east	A linear block of woodland and scrub situated on a NW facing scarp slope with remnant chalk grassland threatened by invading scrub, in places. The grassland to the south-west corner supports the most diverse calcareous flora.
Letchworth Golf Course	LWS	1.4km north	Golf course with copses, streams, hedges and rough grassland which supports a diverse flora and provides good habitats for birds and mammals. There is a substantial area of unimproved neutral grassland of particular high wildlife value with flora of local and county importance.
Keysheath Meadow	LWS	1.6km north	Meadow supporting old secondary neutral/calcareous grassland with hedges and scrub patches. Downy Oat-grass ( <i>Helictotrichon pubescens</i> ) is locally dominant.
Whitney Drive Wood	LWS	1.6km south	Small fragment of ancient semi-natural Hornbeam coppice woodland with large Pedunculate Oak standards. For such a small wood there is a reasonable flora with ancient woodland indicators recorded
How Wood	LWS	1.7km north east	Ancient semi-natural Pedunculate Oak Hornbeam woodland with little coppice, containing mixed broadleaved plantation woodland with old layered Hornbeams around the margin. A large number of planted Sweet Chestnut ( <i>Castanea sativa</i> ) is co-dominant with Pedunculate Oak standards
Hitchin Railway Cutting	RIGS	1.7km north west	This site is of geological importance.
Fishers Green Wood	LWS	1.7km south	Thin strip of ancient semi-natural woodland, predominantly of Hornbeam coppice with Pedunculate Oak ,Ash and Wild Cherry ( <i>Prunus avium</i> ) standards plus some Field Maple ( <i>Acer campestre</i> ) coppice along the boundary. The ground flora is typical of ancient woodland with abundant Bluebell <i>Hyacinthoides</i> sp
Martins Way, Stevenage A1072 East	LWS	1.8km south east	Experimental area to establish calcareous grassland on chalk road banks using wildflower seeds by the Stevenage Zoological Society. Most seed was spread along the north bank. Chalk grassland has successfully established and



			possibly some species have colonised naturally. A range of invertebrates have also been recorded.
Harbourclose Wood	LWS	1.9km east	Ancient semi-natural Pedunculate Oak (Hornbeam Ash, Field Maple (woodland of mainly neglected coppice with a reasonable diversity of woodland ground flora species including some indicator species such as Lady Fern ( <i>Athyrium filix-femina</i> ) and Bluebell
St Nicholas Churchyard, Stevenage	LWS	1.9km south east	Churchyard and road verge with varied botanical interest supporting species-rich neutral grassland over chalk plus hedgerows and trees. The grassland includes a population of Meadow Saxifrage ( <i>Saxifraga granulata</i> ), which has also been recorded along the adjacent road verge.

## 3.2 Existing Records of Notable Habitats

- 3.2.1 A review of MAGIC, OS maps and the Warwickshire Biodiversity Action Plan (BAP) showed five habitats of Principal Importance (also known as priority habitats) as listed under Section 41 of the NERC Act/UK BAP and the Warwickshire BAP within 2km of the Site.
- 3.2.2 Information on priority habitats within 2km of the Site is presented in Table 3.3 below. Where numerous records of a particular habitat were recorded, only the closest record to the Site has been provided, in order to provide context for the Site and surrounding area.

**Table 3.3: Priority habitats – existing records.**

Priority habitat	Designation	Distance of nearest habitat from site
Deciduous Woodland	NERC S41, UKBAP,	100m south west
Ancient & Semi-Natural Woodland	NERC S41, UKBAP, LAP	900m south
Lowland Fens	NERC S41, UKBAP	920m north west
Traditional Orchards	NERC S41, UKBAP, LAP	1km south
Coastal and Floodplain Grazing Marsh	NERC S41, UKBAP, LAP	1.2km north east

**Key: NERC S.41:** Natural Environment and Rural Communities (NERC) Act (2006)

**UKBAP:** UK Biodiversity Action Plan Priority Habitat

**LBAP:** Hertfordshire Biodiversity Action Plan priority habitat

## 3.3 Ancient and Irreplaceable Habitats

- 3.3.1 No records of ancient woodland, ancient or veteran trees, possible peat forming habitats or any other irreplaceable habitats were found within 500m of the Site.

## 3.4 Habitat Survey

- 3.4.1 This section should be read in conjunction with the Phase 1 Habitat Plan presented as **Figure 4**, Target Notes (TNs) presented in **Table 3.4** and photographs presented in **Appendix 2**.

- 3.4.2 The Site consisted primarily of arable crop fields, during the time of the survey most of the fields were out with two fields in the southern section of a pea crop.
- 3.4.3 Semi-improved grassland was present at three separate locations in the form of field margins (TN2, TN8 & TN10) with evidence that these areas were due to a countryside stewardship scheme. The margins were approximately 5-6m wide and uncut at the time of the survey. The species consisted of Yorkshire fog *Holcus lanatus* L, false oat grass *Arrhenatherum elatius*, red fescue *Festuca rubra*, cocksfoot *Dactylis glomerata*, white clover *Trifolium repens*, field clover *Trifolium campestre*, oxeye daisy *Leucanthemum vulgare*, ladies bedstraw *Galium verum*, sweet vernal grass *Anthoxanthum odoratum*, ribwort plantain *Plantago lanceolata*, dandelion *Taraxacum* sp., common vetch *Vicia sativa*, yarrow *Achillea millefolium*, crested dogs tail *Cynosurus cristatus*, selfheal *Prunella vulgaris*, common mouse ear *Cerastium fontanum*, red clover *Trifolium pratense*, hairy tare *Vicia hirsuta*, knapweed *Centaurea nigra* and birds foot trefoil *Lotus corniculatus*.
- 3.4.4 Poor semi-improved grassland was present in the norther section of the Site with a field to the North West and field margin (TN13). The field was separated from the adjacent arable field by a large mound covered in un cut poor semi-improved grassland. The field at the time of the survey had been cut leaving approximately a 5m uncut margin which ran into the next field. The species consisted false oat grass, Yorkshire fog, cocksfoot, common hogweed *Heracleum sphondylium* and cut-leaf cranes bill *Geranium dissectum*.
- 3.4.5 Hedgerows formed field boundary throughout Site ranging from species poor to species rich. The hedgerows are dominated by hawthorns, hazel, blackthorn, field maple & dog rose *Rosa canina* and ground flora consisting of nettles *Urtica dioica*, cow parsley, common hogweed, Yorkshire fog, false oat grass, bristly ox tongue *Helminthotheca echioides*, creeping thistle *Cirsium arvense*, crested dogs' tail & cut leaf cranesbill. The hedgerows were generally intact and well maintained, with mainly immature trees predominantly of ash, hazel, horse chestnut *Aesculus hippocastanum*, crab apple *Malus* sp., field maple. There were areas that the hedgerows had become defunct.
- 3.4.6 Most of the hedgerows were species poor, however there were some hedgerows on Site that were species rich consisting of field maple, rose, elm *Ulmus minor*, blackthorn, hawthorn, hazel & horse chestnut.
- 3.4.7 Several standalone field trees were present on Site, predominantly oak and ash.
- 3.4.8 A number of dry ditches ran along the boundary and within the Site and one wet ditch. The dry ditches were characterised by dense bramble and scrub on the bank and less amounts of elder and cow parsley and steep banks. The wet ditch had very low water levels at the time survey, being only a few inches deep. Vegetation around the ditch was indicative of damp soils, including great willowherb *Epilobium hirsutum* and meadowsweet *Filipendula ulmaria*.
- 3.4.9 Two access tracks ran through the southern section of the Site.
- 3.4.10 In the southern section of the site a wooden fence ran along the east and northern boundary along the A1(M).
- 3.4.11 No ponds were located within the Site but 8 were identified within 250m of the Site from OS mapping and aerial imagery. At the time of the survey only two ponds could be accessed P1 & P7. Both P6 and P8 were not ponds P6 was a fast flowing stream and P8 a dry ditch. During the time of the survey there was no land access for P2-P5 & P9-P11.

**Table 3.4 Target Notes**

Target Note	Comments
TN1	Species rich neutral grassland field margin approximately 6m wide unmown. Sign present indication Countryside Stewardship Scheme. Yorkshire fog, red fescue, cocksfoot, white clover, field buttercup, oxeye daisy, ladies bedstraw, sweet vernal grass, ribwort plantain, dandelion
TN2	Large mature ash and oak on boundary with likely BRP.
TN3	Field margin of MG1 grassland approximately 5m wide unmown. Yorkshire fog, cocksfoot and common hogweed. Steep sided ditch ran adjacent densely vegetated scrub, nettles, great willow herb and meadow sweet. Only a small amount of water within ditch.
TN4	Mature oak on the site boundary line, moderate bat roost potential.
TN5	Track running along the south side of hedge.
TN6	Semi-improved grassland about 6 m wide consisting of Yorkshire Fog (d), smooth meadow grass (f), hogweed (f), red fescue (a), meadow buttercup (f), oxeye daisy (d), creeping thistle (f), ribwort plantain (f), crested dogs tail (f), selfheal (r), cut leaf cranesbill (f), hop trefoil (f), mouse ear (r), red clover (f), hairy tare (f), knapweed (a) and birdsfoot trefoil (f).
TN7	Last standing bit of hawthorn hedge, now a strip of semi-improved grassland (TN10).
TN8	Semi-improved grassland about 5m wide consisting of Yorkshire fog (d), knapweed (a), birdsfoot trefoil (f), oxeye daisy (d), hogweed (a), yarrow (f), sorrel sp (f), red clover (f), hairy tare (f) and lady's bedstraw (f).
TN9	Immature trees no bat potential, oak, hawthorn and field maple
TN10	Immature trees no bat potential, ash, oak, hawthorn, dog rose and horse chestnut.
TN11	Dry ditch along the southern boundary of the southern section. There was an outflow pipe underneath the motorway suggesting this ditch is not always dry.

**Table 3.5 Ponds accessed during the habitat survey**

Pond Number	On-Site (S)/ Wider area (W)	Comments
1	W	A large pond completely shaded in a woodland measuring 15x35m. At the time of the survey the pond was very leaf choked and minimal surrounding vegetation consisting of bare ground, ivy and nettles. The Surrounding habitat was an arable crop field and a single lane road.
7	W	A large pond measuring 1750m <sup>2</sup> with a fast flowing stream running in to it. The pond was surrounded by elder, sycamore and hawthorn and bank side vegetation of meadow sweet, bramble, yellow iris, pendula sedge and unmown grass. During the time of the survey there were a number of mallard and moorhen present. The surrounding habitat was a grazed cow field, managed garden and tarmac access track.

## 3.5 Protected and Notable Species

### *Birds*

- 3.5.1 The data search requested from the HERC returned 107 bird species records from the last 10 years within a 2km radius of the Site. Nineteen Schedule 1 (Wildlife and Countryside Act 1981 (as amended)) species were recorded within 2km of the Site.

#### Breeding Bird Surveys

- 3.5.2 The breeding bird assemblage recorded within the Site is representative of typical farmland habitats comprising of predominantly common species. A total of 10 notable species were considered to be breeding within the site. These consisted of two Amber List species (dunnock and stock dove) and eight Red List species (skylark, song thrush, yellow wagtail, starling, grey partridge, corn bunting, linnet and yellowhammer). Nine of those species (all except stock dove) are also species listed as rare and most threatened species under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006). Skylark, grey partridge, linnet, corn bunting and song thrush are also listed as species priorities in the Hertfordshire LBAP, with Skylark having its own species action plan. The number of breeding territories of these notable species was generally low for a relatively large site, being 5 pairs or fewer for all species except skylark and yellowhammer, which had 19 pairs and nine pairs, respectively.
- 3.5.3 The Notable Species breeding assemblage was typically associated with vegetation along field boundaries, principally hedgerows, trees and watercourses. The only exception to this was the ground-nesting species, skylark which was typically associated with arable fields within the Site.

Notable breeding species recorded along with an estimated number of territories are detailed within **Table 3.6**. The indicative locations of the territories of Notable Species recorded are provided in **Figure 6**.

**Table 3.6: Breeding bird survey results.**

(R) = BOCC4 red list, (A) = BOCC4 amber list, (L) = Local BAP, (N) = NERC act

Common name	Estimated number of territories/ pairs <sup>20</sup>
Skylark (R, L, N)	19
Stock dove (A)	3
Dunnock (A, N)	3
Yellowhammer (R, N)	9
Yellow wagtail (R, N)	5
Starling (R, N)	1
Grey partridge (R, L, N)	1
Linnet (R, L, N)	1

<sup>20</sup> Where differing numbers were recorded over the three survey visits the highest number of territories recorded in any one survey visit has been used.

Corn bunting (R, L, N)	1
Song thrush (R, L, N)	1

- 3.5.4 In addition to the records in table A5.2 above, a number of non-breeding records of notable species were also observed. Notable non-breeding species using the site included: mallard; red kite; kestrel; and hobby. This included a variety of activities, including roosting and flyovers.
- 3.5.5 A number of non-notable species were recorded also using the site, however as these are of widespread and common species typical of farmland environments these species are not considered pertinent to the assessment as it is not considered the development will have an effect on population sizes at a level beyond the Site and its immediate surrounds.

### **Bats**

- 3.5.6 The data search returned 17 records of seven species of bat including; brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, soprano pipistrelle *Pipistrellus pygmaeus*, nathusius's pipistrell *Pipistrellus nathusii*, long-eared bat species and an unidentified bat with the closest record situated 600m east of the Site.
- 3.5.7 The MAGIC website includes locations of European Protected Species (EPS) mitigation licences granted for developments which affects bat roosts. One EPS mitigation licenses (2017-32115-EPS-MIT) have been granted within 2km of the Site issued 2018.

### Roosting Bats

- 3.5.8 There are no buildings or structures present within the Site. Most hedgerows at the field boundaries contain semi-mature and mature trees, of which several are likely to have bat roost potential, as would some of the semi-mature/mature trees in the woodland areas within and outside the Site.

### Foraging and Commuting Bats

- 3.5.9 Much of the Site consists of open arable land which has limited value for foraging and commuting bats, however the network of hedgerows, trees, woodland and ditches provide suitable and connected foraging and commuting habitat. The Site has good connectivity to higher value habitat in the surrounding landscape along these field boundaries. Consequently, the Site is considered to provide moderate value foraging and commuting habitat in accordance with BCT guidance<sup>21</sup>.

### **Badger**

- 3.5.10 Seventy-seven records for badger *Meles meles* with most of the records found through road traffic casualties, the closest record was 600m east of the Site.
- 3.5.11 No field signs of badger were recorded during any of the surveys conducted on the Site. There are however suitable habitats within the Site and in the surrounding countryside, including woodland and hedgerows, for commuting, foraging and sett creation. Badgers may therefore be locally present.

### **Otter and Water Vole**

- 3.5.12 The data search returned one record of otter located 930m west from the Site and 12 records of water vole *Arvicola amphibius* located 1.1km north west from the Site. All water vole records are centred on

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<sup>21</sup> Collins *et al.* (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3<sup>rd</sup> edition, BCT: London

the connected watercourses of Ippollitts Brook, Ash brook and River Purwell, from which there is limited connectivity to the Site.

- 3.5.13 Several drainage ditches are present along the field boundaries, most of which were dry or very shallow. These ditches provide sub-optimal habitat for otter with limited suitability holt creation and little foraging potential. Opportunities for holt creation and resting up were limited to the boundary woodland strips, hedgerows and scattered trees along the ditches. The open arable land provides very limited suitability for otters, lacking foraging resources or shelter and being subject to regular disturbance.
- 3.5.14 Similarly, habitat suitability for water vole was limited to the one wet ditch that is present. Again, the arable fields are unsuitable for water voles.
- 3.5.15 No evidence of either otter or water vole presence was recorded during the extended Phase 1 habitat survey.

### ***Dormouse***

- 3.5.16 The data search returned no records for hazel dormouse *Muscardinus avellanarius* within 2km of the Site in the last ten years. The majority of the Site (arable and grassland) is unsuitable for this species. The scattered areas of woodland and the hedgerows within the Site offer some potentially suitable habitat. Blocks of woodland are present in the wider area, connected by hedgerows, however these blocks are generally relatively small at under 10ha.
- 3.5.17 The boundary hedgerows within the Site are largely species-poor and managed, and offer limited opportunities for foraging, breeding or shelter.
- 3.5.18 Dormice are now rare within Hertfordshire and are only found in discrete localities, one of which is Stevenage. Stevenage is approximately 3.5km from the Site but is separated by the A1, it is therefore considered that the species is not likely to be present on Site and dormice are not considered further within this assessment.

### ***Amphibians and Reptiles***

- 3.5.19 The data received from HERC returned 2 records for great crested newt (GCN) with the closest being 1km south of the Site. Ten records of common toad *Bufo bufo* were returned with the closest record being 980m north west of the Site. No records were returned for reptiles were returned within 2km of the Site.
- 3.5.20 A review of MAGIC identified two GCN class licence return within 2km submitted between 2014-201
- 3.5.21 No ponds were located within the Site but a review of OS mapping and aerial imagery indicated eight ponds located within 250m of the Site. Of these eight ponds both P6 and P8 turned out not to be ponds. P6 was a fast-flowing stream and P8 a dry ditch. At the time of the survey only two ponds, P1 & P7, could be accessed as there was no land access for P2-P5 & P9-P11.
- 3.5.22 P1 scored 'below average' and P7 scored 'poor' on the GCN Habitat suitability Index.
- 3.5.23 The dominant arable farmland habitats on Site provide very low suitability as amphibian terrestrial habitat, however, field boundary features such as woodland and hedgerows provide more suitable terrestrial habitat for shelter, dispersal and foraging.
- 3.5.24 For both ponds surveyed the eDNA results were returned negative, indicating that GCN are unlikely to be present in these ponds and therefore also within the Site. The two ponds surveyed are geographically separate and are considered to represent an adequate sample of the 6 suitable ponds in proximity to the Site.

3.5.25 The Site is dominated by arable farmland, which is considered to be of a very low value for reptile species. However, the field boundary habitats do provide some opportunities for foraging/hibernation purposes, including hedgerows, ditches and bankside areas.

#### ***Other Notable Species***

3.5.26 The data search returned records of other notable species including hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* and polecat *Mustela putorius* within 2km of the Site. Multiple records were returned for notable invertebrates see Appendix 3.

3.5.27 Several brown hare have been observed on Site during the phase 1 survey. The Site provides opportunities for breeding, foraging and shelter. The hedgerows and woodland also provide opportunities for hedgehog.

3.5.28 The habitats within the Site are not considered to be of a floristic or structural quality which could support significant assemblages of invertebrates or notable species. There was a sign present in the Northern section of the Site showing that the Site was part of a Countryside Stewardship Scheme.

#### ***Invasive Non-native Species***

3.5.29 A number of invasive species records were returned from the HERC data search including Chinese muntjac *Muntiacus reevesi*, Eastern Grey Squirrel *Sciurus carolinensis*, Indian (Himalayan) Balsam *Impatiens glandulifera*, Japanese Knotweed *Reynoutria japonica* and American Signal Crayfish *Branta canadensis*.

3.5.30 During field surveys, no invasive non-native species were encountered.

## 4 DISCUSSION

### 4.1 Overview

- 4.1.1 This section seeks to identify the potential for effects on habitats and protected and notable species which could be considered as reasonably likely to occur. The Site's proximity to statutory and non-statutory designated sites and potential effects on their qualifying interests is discussed. Measures are proposed for the protection of sensitive habitats and species throughout the construction phase of development and recommendations are made for further pre-construction surveys and mitigation, if required.
- 4.1.2 This section also introduces opportunities for post-development habitat enhancement as part of the proposed project for the benefit of local biodiversity.

### 4.2 Designated Sites for Nature Conservation

#### *Statutory Designated Sites*

- 4.2.1 Seven statutory designated sites of national importance are located within 5km of the Site. The closest is Purwell Meadows LNR located 1.4km north of the Site, a mixture of meadows and play area. No internationally designated sites are located within 10km of the Site.
- 4.2.2 The Site lies within a Site of Special Scientific Interest (SSSI) Impact Risk Zone (IRZ); however, solar schemes are not listed on the qualifying criteria whereby the LPA would be required to consult with Natural England.
- 4.2.3 There will be no direct effect on habitats within any statutory designated sites due to the distances involved, the nature of the proposed development and absence of impact pathways. Indirect effects will be avoided through the implementation of standard good practice drainage management and pollution prevention and runoff control measures during the construction and operation of the proposed development.

#### *Non-statutory Designated Sites*

- 4.2.4 Nineteen non-statutory designated sites were present within 2km of the Site, including Wymondley Transforming Station LWS which is crossed by the proposed cable route. Gravely Hall Farm LWS is located 350m east from the solar array site.

#### Wymondley Transforming station LWS

- 4.2.5 The cable route crosses Wymondley Transforming Station LWS for approximately 100m between Sperbery Hill and the main transforming station site. Creation of the cable route will involve the digging of a trench approximately 0.9m wide and up to 1.5m deep. The trench will subsequently be backfilled with no permanent above-ground infrastructure. The LWS is designated for grassland indicators associated with a poor, stony substrate on chalk.
- 4.2.6 An alternative route is not available as the LWS completely surrounds the transforming station (as shown on Figure 4) other than the existing access tracks which cannot be used as National Grid do not accept disruption to existing access roads. The cable route has been designed to cross the shortest practicable route through the LWS.
- 4.2.7 In order to ensure no long-term negative effects to Wymondley transforming station LWS a soil management plan will be implemented. This will briefly involve removing the soil in layers and storing each layer separately so that when the trench is backfilled the soil can be replaced in the same order



in which it was excavated. This will ensure that the topsoil and seedbank within remains close to the surface and that soil conditions, including PH and nutrient levels, remain unchanged. This will allow for the natural colonisation of the soil by species already present within the LWS and contained within the seedbank in the topsoil.

- 4.2.8 Given the relatively narrow width of the trench, and through following a soil management plan, as well as standard pollution prevention guidance, it is anticipated that any impacts resulting from the construction of the cable route will be temporary only and no long-term negative effects will occur to Wymondley Transforming station LWS. The soil management plan shall be conditioned and required to be submitted to the local planning authority prior to commencement of works within Wymondley Transforming station LWS.

#### All other LWS

- 4.2.9 Due to the distance from the Site and lack of impact pathways, there will be no direct effect on any other non-statutory designated sites. In addition, standard measures to ensure runoff control and pollution prevention will be implemented during construction of the proposed development; these measures will safeguard off-site habitats and species they support. With such measures in place, no indirect effects are anticipated on non-statutory designated sites in the wider area.

### **4.3 Existing Records of Notable Habitats**

- 4.3.1 The nearest record of priority habitat was deciduous woodland approximately 100m from the Site. Due to the distance between this and other notable habitats, and the absence of any possible impact pathways it is considered that there is no potential for any impact on notable habitats.

### **4.4 Ancient and Irreplaceable Habitats**

- 4.4.1 No ancient or irreplaceable habitats were located within 500m of the Site, and therefore no impacts are predicted.

### **4.5 Habitat Survey**

- 4.5.1 The habitats within the Site primarily comprise arable fields of low ecological value. The semi-improved, poor semi-improved grassland field margins, hedgerows, trees, woodland and ditches provide higher biodiversity value at a local geographic scale.

- 4.5.2 The construction of solar farms generally requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground) for the infrastructure. Direct loss of habitat is therefore considered to be small and will comprise mostly of low ecological value arable land which is widely present in the local landscape.

- 4.5.3 Effects during construction relate to physical disturbance and removal of arable land, primarily comprising temporary compaction and soil disturbance from plant machinery and vehicles. This will be temporary and of relatively limited duration (anticipated to be approximately seven months). Construction will proceed in phases and hence not all of the Site will be disturbed at the same time. For the operational lifetime of the proposed development the intensively managed arable land will be replaced by extensive areas of more species and structurally-diverse grassland, which will be managed throughout the lifetime of the operational solar farm to provide higher value habitat for a range of wildlife.

- 4.5.4 The proposed access tracks will exploit existing farm accesses and gaps in hedgerows where possible, requiring only very localised disturbance of short sections of hedgerow, similar to that required for farm machinery access. New and existing access tracks are identified on the Site Layout Plan. Access

routes will avoid mature trees. Overall, the network of hedgerows and ditches will be retained and protected, maintaining habitat connectivity and linkages across the Site itself and with the surrounding wider landscape.

- 4.5.5 The layout of the proposed development has been designed to maintain a stand-off buffer from the boundary features (ditches, hedgerows and trees). Standard good practice construction methods including pollution prevention and control will ensure that there are no indirect effects on the ditches, or other neighbouring habitats. In addition, the solar farm will not be lit once constructed, maintaining dark corridors around the Site as a whole and in particular along hedgerows and tree lines.
- 4.5.6 Retained hedgerows, woodland and trees will be protected during construction following British Standards BS5837:2012 *Trees in relation to design, demolition and construction*, with measures including root zone protection and clear instructions on the location of materials storage areas away from trees and their root protection zones.
- 4.5.7 Opportunities will be sought to provide an overall biodiversity gain; in line with BS 42020 – *A Code of Practice for Biodiversity in Planning and Development*. Habitat enhancement and management measures set out in the Biodiversity Management Plan (BMP) will enhance the Site for the benefit of local wildlife. The design and long-term management of the land seeks to maintain and improve functionality through protecting and enhancing potentially important wildlife corridors i.e. through strengthening connectivity and linked habitats through native species hedgerow and tree planting, and through the creation of extensive species rich and structurally diverse grassland habitats under and around the solar panels, and around the Site perimeter which will provide enhanced wildlife benefits over and above the low value arable land currently present.
- 4.5.8 Habitat enhancement measures are proposed for the Site, set out in the BMP and illustrated in the *Detailed Landscape Design* (Drawing No. 3004-01-12 Landscape Proposals). These include:
- Native tree and hedgerow planting, including infilling of existing hedge gaps;
  - Grazed diverse pasture within the fence line and under panels; and
  - Species rich grassland buffers.

## 4.6 Biodiversity Net Gain

- 4.6.1 Full results of the biodiversity net gain assessment can be seen in the Biodiversity Metric 3.0 spreadsheet for the scheme, available as a separate document.

### ***Area habitats***

- 4.6.2 Area habitats within the site total 85.88 ha and are generally of low distinctiveness, with a small area of (1.9ha) of medium distinctiveness other neutral grassland. It has been assumed that all area habitats within the site will be lost for the purposes of the development. Habitats within the site total 191.52 biodiversity units.
- 4.6.3 Habitat creation principally involves the sowing of other neutral grassland, which will be lightly grazed pasture, including under the panels. The comprises 78.15 ha of the post works area. Approximately 1.66 ha of broadleaved woodland will be planted around the periphery of the site, along with approximately 5.79ha of species rich grassland. Built structures and containers such as control rooms, battery storage containers and inverter/ transformers account for 0.28ha. Habitat creation delivers a total of 576.90 biodiversity units.
- 4.6.4 Area derived biodiversity units increase by +388.10 biodiversity units, a significant net gain of +202.64%.

## **Linear habitats**

- 4.6.5 Linear habitats within the site total 3.33 ha and consist of native hedgerow, native hedgerow associated with a bank, native hedgerow with trees and native species rich hedgerow. All hedges are in good condition. Baseline hedgerow units total 25.56 linear biodiversity units.
- 4.6.6 Approximately 1.77km of hedges will be retained, with the remaining 1.56km being enhanced through gapping up and increasing species richness. No hedgerow is due to be lost. In addition to the retained and enhanced hedgerows, 1.97km of new hedgerow will be created. Retained hedgerows account for 16.20 linear biodiversity units, enhanced hedgerows generate 17.19 linear biodiversity units and newly created hedgerows deliver 15.42 units. The total of post works linear biodiversity units is 48.81.
- 4.6.7 Linear biodiversity units increase by +23.25 units, a significant net gain of +90.96%

## **Discussion**

- 4.6.8 The scheme results in large net gains of 202.64% for area derived units and +90.96% for linear derived units. This is due to the low value of existing habitats (arable) being replaced with higher value grassland that will be managed to achieve at least moderate condition. For linear units, the gains are due to protecting all existing habitat and providing enhancements, alongside substantial habitat creation.
- 4.6.9 The post works habitats satisfy all trading principles, by which habitats must be replaced on a like-for-like, or like-for-better basis.

**Table 4.1: Summary of Biodiversity Net Gain Results.**

<b>Unit type</b>	<b>Baseline units</b>	<b>Post-works units</b>	<b>Unit change (% change)</b>
Habitats	191.52	579.62	+388.10 (+202.64%)
Hedgerows	25.56	48.81	+23.25 (+90.96%)

## **4.7 Protected and Notable Species**

### **Birds**

- 4.7.1 The breeding bird assemblage using the Site is typical of farmland habitats in the region, and is likely to be of no more than local value. The majority of the species were associated with vegetation along field boundaries in the Site, namely field margins, hedgerows trees and woodland, which are retained and protected as part of the proposed development. Skylark, a ground-nesting species which favours open habitats, was recorded at up to 19 territories.

### Breeding and foraging

- 4.7.2 All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended). Species listed under Schedule 1 of the Act, have special protection with increased penalties for offences committed towards these birds. Additional protection is provided to species listed under Directive 2009/147/EC on the conservation of wild bird (the 'Birds Directive').
- 4.7.3 In order to reasonably avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), it is recommended that vegetation removal and ground clearance takes place outside of the bird breeding season (March-August inclusive) if possible.

If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works should be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the legislation.

- 4.7.4 The physical footprint of a solar farm and associated land take is low, with extensive areas of grassland habitat created and maintained under and around the solar panels, replacing intensively managed arable land. This new grassland (and retained hedgerows, trees, ditches and ponds, along with the cessation of ploughing and pesticide applications, will attract and support an increased invertebrate assemblage, likely to substantially increase foraging opportunities for local bird populations.
- 4.7.5 Arable cropping regimes strongly affect the actual breeding success of ground nesting birds, and it is considered that a suitably managed low intensity grassland habitat is likely to enhance breeding opportunities as well as foraging resources for the local populations of a range of birds, including Notable Species.

#### Displacement

- 4.7.6 The main potential effect of construction of the proposed development is the displacement of foraging and nesting birds. The majority of the breeding birds within the Site are associated with field boundary vegetation, particularly hedgerows and trees. These boundary features are not expected to be directly impacted by the proposed development. These features should be protected, with an appropriate buffer zone, to ensure this vegetation (and root systems) are not impacted by the works. If this is adhered to those nesting species along field boundaries are likely to be unaffected by the works, and are considered at low risk from displacement.
- 4.7.7 Birds nesting on open ground, such as skylark, may be temporarily displaced if construction takes place during the breeding season; however, in the context of comparable habitats locally the area lost will be small. Furthermore, it has also been noted in the literature that ground-nesting bird species may nest between and around rows of solar panels, so displacement is unlikely to be permanent. The gaps between rows of panels will be 4m wide, which is the recommended width for skylark plots, however it is acknowledged that the rows of panels may create a more enclosed environment than that preferred by skylark. However, there are other less enclosed areas within the solar array such the c. 30m by 850m open corridor along the route of the existing gas main and numerous areas around the perimeter of the site.

#### Solar Farm Use by Breeding Birds through Habitat Enhancement

- 4.7.8 The proposed development will create over 78 ha of new lightly grazed pasture grassland between the solar panels and 6.8 ha of diverse grassland around the margins, replacing existing arable land. This grassland will provide improved breeding and foraging habitats for ground-nesting birds, such as skylark, and where adjacent to hedgerows, species such as yellowhammer.
- 4.7.9 A study looking at changes in biodiversity between solar farms and undeveloped sites by Montag *et al.* (2016)<sup>5</sup> found that overall diversity and abundance of birds was higher in solar farms compared to adjacent 'control' sites. The study documents that solar farms may provide an important resource for declining species, such as skylark, as this species utilises habitats within the solar development footprint. The study found the difference in skylark number within solar farms and control plots to be non-significant. Recent studies conducted by the Royal Society for the Protection of Birds (RSPB)<sup>22</sup> further support high bird usage of solar farms by farmland bird species, including ground-nesting species including skylark. In addition the West Oxfordshire Farmland Birds Project recorded farmland

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<sup>5</sup> <https://community.rspb.org.uk/ourwork/b/biodiversity/posts/bird-use-on-solar-farms-final-results> Accessed 28/05/2021.

bird species (such as corn bunting) feeding and nesting within an operational solar farm in 2020, further illustrating that such species can and do utilise grassland on solar sites.

- 4.7.10 Habitat enhancement opportunities which form a major part of the solar farm development will benefit a variety of breeding bird species. Measures, including replacing intensively farmed arable fields and intensive pasture with species-rich wild-flower grassland, planting hedgerows and trees, 'gapping-up' existing defunct hedgerows and installing bird boxes will enhance nesting and foraging opportunities for the bird assemblage onsite.
- 4.7.11 A large easement of around 30m, which will be lightly grazed pasture, is proposed within the Site which will create the open habitat preferred by skylark.
- 4.7.12 With mitigation measures adopted to ensure that any works associated with the proposed development during the breeding bird season do not negatively impact nesting birds, it is concluded that the local breeding bird assemblage is unlikely to be adversely impacted by the proposed development, and in the longer term may actually benefit from the habitat change and proposed habitat management measures.

### **Bats**

- 4.7.13 All species of British bat are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Bats are further protected under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The Act and Regulations make it an offence to:
- kill, injure or take any wild bat;
  - damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection; and
  - Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection.
- 4.7.14 The Site contains no buildings or structures. Some of the mature trees on Site are considered to have bat roost potential; these and all other trees on Site will be retained and protected following British Standards BS5837:2012 *Trees in relation to design, demolition and construction*. Existing hedgerows will also be retained and protected during construction (with only very minor removal required) with additional hedgerow and tree planting proposed as part of the *Detailed Landscape Design* and described in the BMP. As a result, there will be no loss or disturbance to any trees with roost potential.
- 4.7.15 Although no trees are currently proposed to be affected, should this change suitable checks for roosting bats will be undertaken in advance of any removal. If bats are confirmed to be roosting within any tree to be impacted by proposed works, the data gathered would be used to inform potential design amendments avoid or reduce impacts or, failing that support a licence application to Natural England to destroy/disturb the bat roost.
- 4.7.16 Species rich and structurally diverse grassland habitat creation proposed as part of the development, along with the cessation of agricultural pesticide use, will attract and support a higher number of flying insects compared to the existing arable land, which will in turn increase foraging opportunities for bat species locally present.
- 4.7.17 Once constructed the solar farm will not be routinely lit. Any lighting associated with the substations, transformer and inverter cabinets will be very localised and will only be used on occasion, for example if an engineer needs to carry out emergency visits to the Site at times when natural light levels are low. Any lighting required during construction will be designed to be directed away from sensitive habitats surrounding the proposed development. Therefore, no discernible effects are anticipated on nearby habitats e.g. woodland and watercourses, and the species they support. As the Site will not be

lit, trees with roost potential and foraging and commuting 'dark' corridors along hedgerows and trees lines will not be subject to any new illumination.

- 4.7.18 The inclusion of bat boxes and landscape planting, detailed within the BMP, would enhance opportunities for roosting/foraging/commuting bats. Overall, the development will retain current habitat features and provide additional benefits for roosting and foraging bats.

### ***Badger***

- 4.7.19 Badgers and their setts are protected under the Protection of Badgers Act 1992. Under the Act it is an offence to: wilfully kill, injure, take, possess or cruelly ill-treat a badger; to attempt to do so: or, intentionally or recklessly interfere with a sett.
- 4.7.20 Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett. It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or destroyed. Where an activity is likely to result in an offence under the Protection of Badgers Act 1992 a licence from Natural England is required.
- 4.7.21 No evidence of badger presence was observed during surveys, although several records of badger fatalities were returned from the road running adjacent to the Site, indicating that badgers are present in the local area. Construction of the proposed development will not result in disturbance or destruction of any badger sett or obstruct access to setts. Once constructed, the proposed development (with panels raised off the ground) will not sever potential commuting routes used by badgers, with linear features such as hedgerows and ditches to be retained and protected as part of the proposed development. Gaps or mammal gates will be installed at suitable intervals and locations along the perimeter fence line to allow badgers and other small mammals free movement into and out of the Site, providing enhanced opportunities for foraging and refuge within what will be a relatively protected and undisturbed area. This will ensure continued habitat connectivity in the wider environment.
- 4.7.22 Habitat enhancement measures which will also benefit badgers potentially present are detailed within the BMP.
- 4.7.23 Due to the highly mobile nature of badgers, a pre-construction badger check will be undertaken to confirm the continued absence of badger setts within and adjacent to the proposed development area before commencement of works. If a sett is found, suitable advice will be sought from the project ecologist to ensure necessary protection, avoidance or mitigation measures are in place before works proceed.

### ***Otter and Water Vole***

- 4.7.24 Otters are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); they receive further protection under the Habitats Regulations. The Act and Regulations make it an offence to:
- Deliberately capture, injure or kill an otter
  - Damage or destroy a breeding site or resting place
  - Deliberately disturb an otter, particularly in a way which is likely to:
    - To impair their ability to survive, breed or reproduce, rear or nurture young, and;
    - To affect significantly the local distribution or abundance of the species.

- 4.7.25 Otters are also listed under Section 41 of the NERC Act 2006 and listed as a priority species within the Hertfordshire Biodiversity Action Plan and is therefore, a material consideration within the planning process.
- 4.7.26 The water vole and its habitats receive full legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Water vole is also listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and within the Hertfordshire Biodiversity Action Plan and is therefore, a material consideration within the planning process.
- 4.7.27 No signs of otter or water vole presence has been recorded during survey and given the low value of the ditches for otter and Site habitats as a whole, this species is considered unlikely to be present. It is also considered that water voles are unlikely to be present on Site, or if present, occur in very low numbers.
- 4.7.28 With stand-off buffers maintained around ditches, as well as along hedgerows and woodland, the proposed development is not considered to adversely affect potentially suitable habitat for these species, if present in the future.
- 4.7.29 As a precautionary measure, if works are required to install or extend culverts to accommodate access tracks or fencing, a pre-construction survey for otter and water vole would be completed by a suitably experienced ecologist prior to the commencement of works to check for new signs of activity and/or newly created holts in the vicinity.
- 4.7.30 Construction traffic using the culverts and access track will be temporary and of limited duration, affecting only a short section of bankside habitat, proportionate to current agricultural practices in the area. Operational use of the tracks and crossings will be low, involving only intermittent maintenance and inspection visits.
- 4.7.31 Standard good practice measures will be employed to ensure runoff control and pollution prevention to protect aquatic/bankside habitats both on Site and in the wider ditch network.
- 4.7.32 As a precaution temporary construction works affecting ditches could be undertaken under Reasonable Avoidance Measures (RAMs) and in line with a Construction Environmental Management Plan (CEMP).
- 4.7.33 Upon completion of construction, the ditches, ponds and bankside habitat will remain available for water voles and otters to utilise, if they colonise the area in the future. The culverts will not present a barrier to the free movement of water vole or other species along the watercourse corridor. It is considered that the occasional use of access tracks and routine maintenance during operation will have no effect on either species, if present in the future.
- 4.7.34 Habitat enhancement and ongoing management throughout the lifetime of the operational solar farm could benefit water voles in the future, in the event that they colonise the area. The establishment of structurally and species diverse grassland, under and around the solar panels and at field margins that run adjacent to the ditches, could benefit water voles (if present), through enhanced habitat connectivity in the landscape. The change in management practices on the Site could also be of benefit to the species, with permanent grassland creation, the cessation of annual cultivation and likely inputs of pesticides and fertilisers, all contributing to local improvements in water quality.

### ***Amphibians and Reptiles***

- 4.7.35 GCN and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations). The Act and Regulations make it an offence to;
- Kill, injure or take a great crested newt;

- Damage, destroy or obstruct access to any place that a great crested newt uses for shelter or protection; and,
- Intentionally or recklessly disturb a GCN while it is occupying a structure or place that it uses for shelter or protection. GCN are listed as a species of principal importance within Section 41 of the NERC Act and GCN are also listed as a priority species within the Warwickshire Action Plan and therefore, are also of material consideration within the planning process.

4.7.36 Common reptile species namely the common lizard, slow-worm, grass snake and adder *Vipera berus* are protected against killing, injuring and sale under the Wildlife & Countryside Act 1981 (as amended). GCN and common toad and widespread reptile species (common lizard, slow worm, grass snake and adder) are listed as priority species under Section 41 (England) of the NERC Act 2006 and UK BAP. GCN are also within the Hertfordshire Biodiversity Action Plan and is therefore, a material consideration within the planning process.

4.7.37 All ponds surveyed using eDNA methodology returned a negative result, indicating that GCN are unlikely to be present.

4.7.38 The majority of ditches were found to be dry at the time of survey with a one wet ditch. The vast majority of the Site is arable farmland, which is of very low suitability for amphibian and reptile species.

4.7.39 The higher value habitats for amphibian and reptile species (if present) such as hedgerows and ditches will be retained and protected during construction and operation of the development, with only minor localised works required for access. As a precautionary measure, Reasonable Avoidance Measures (RAMs) would be implemented during the construction phase to safeguard animals during works if minor removal of suitable habitat is required.

4.7.40 The proposed development will have no direct effects on neighbouring habitats and with standard good practice pollution prevention and runoff control measures in place during both construction and operation phases, these off-site features and the species they support can be suitably protected from the risk of indirect effects.

4.7.41 As a result of habitat enhancements, including the creation of new grassland areas and new hedgerow planting, the completed development will provide higher value terrestrial habitat for wildlife, including amphibians and reptiles if present in the future.

### ***Other species***

4.7.42 Brown hare have been observed on Site. The Site and surrounding area may potentially support hedgehog; however, these species are not considered to be a significant constraint in terms of proposed development. Both species are listed as priority species under Section 41 (England) of the NERC Act 2006 and UK BAP.

4.7.43 The habitats on Site are typical of habitats in the wider environment, and therefore the loss of arable farmland foraging habitat as a result of the proposed development is not considered to negatively impact local populations of brown hare. The hedgerows which are likely to be utilised by the species, will be retained within the final development layout and it is also considered that the development of undisturbed extensive grassland beneath and surrounding the proposed solar development will provide the species with additional suitable grassland foraging and rearing habitats.

4.7.44 The field boundary habitats located within the Site may also be utilised by hedgehog. Hedgerows will be retained and enhanced within the proposed solar developments final layout and will be protected during the construction process. Additionally, proposed extensive grassland on Site will provide additional suitable habitats for this species within the Site boundaries.



- 4.7.45 Security fencing located around the Site perimeter will have gaps or mammal gates positioned at several locations along the base of fences in order to allow mammal species such as brown hare and hedgehog (amongst others) to continue to use the habitats on Site during the operational period, thereby maintaining dispersal routes and opportunities to access relatively undisturbed habitat within the secured Site and connectivity in the wider landscape.
- 4.7.46 The retention/enhancement of hedgerows on Site will likely continue to provide a variety of invertebrate species with suitable habitats. The development of grassland beneath and surrounding the proposed solar development along with new native species planting and the cessation of agricultural chemical spraying will enhance the Site's potential to support a diverse invertebrate assemblage.

#### ***Invasive Non-native Species***

- 4.7.47 No invasive species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) were recorded on Site. It is an offence to plant or otherwise cause such species to grow in the wild. This includes allowing the species to grow/spread, spreading the species or transferring polluted ground material from one area to another.
- 4.7.48 These species and soil containing these species area also classed as controlled waste and such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991.
- 4.7.49 Should any new area of invasive species be encountered or suspected on Site, prior to or during construction, the advice of a suitably qualified ecologist should be sought and the appropriate measures taken.

## 5 SUMMARY – ECOLOGY PRIORITY MATRIX

**Table 5.1: Ecological Constraints and Opportunities**

Feature		Details
Statutory and Non-statutory designated sites for Nature Conservation	Constraints & Opportunities	<p>a. The cable route crosses Wymondley Transforming station LWS</p> <p>b. No direct or indirect impacts upon any other statutory or non-statutory designated site are anticipated by virtue of lack of functional linkages, implementation of good practice measures and the restricted scale and nature of the proposed development.</p>
	Protection Measures	<p>c. A soil management plan shall be conditioned and prepared and submitted to the LPA prior to commencement of works within the Wymondley Transforming Station LWS.</p>
Habitats & Flora	Constraints & Opportunities	<p>d. The main habitat within the Site and which will be affected by the proposed development comprises agricultural grassland, of low ecological value.</p> <p>e. Boundary habitats including woodland and remnant hedgerow will not be impacted by the proposed works.</p> <p>f. The Proposed Development includes for the creation of areas of meadow grassland, tree and scrub planting, which will serve to enhance the Site's value for wildlife and strengthen habitat connectivity in the landscape.</p>
	Protection Measures	<p>g. Standard measures to protect retained trees, ensure runoff control and pollution prevention will be implemented during construction; these measures will safeguard habitats on and immediately surrounding the Site.</p>
Birds	Constraints & Opportunities	<p>h. The agricultural fields on Site provide limited opportunities for breeding birds. Woodland and hedgerow habitats to the periphery of the Site will be retained and protected.</p> <p>i. It is proposed to include ten bird boxes on trees around the Site and which will enhance opportunities for nesting birds.</p>
	Legislative Compliance – WCA**	<p>j. Vegetation works should be undertaken outside of the bird breeding season (01 March to 31 August inclusive). If vegetation works are necessary during the breeding season, suitable nesting habitat should be searched by a suitably experienced ecologist prior to works commencing. Only when the ecologist is satisfied that no offence will occur under the legislation will works be permitted to proceed.</p>
Bats	Constraints & Opportunities	<p>k. No structures or trees, with the potential to support roosting bats will be impacted as a result of the proposed development.</p> <p>l. Woodland and hedgerow habitats to the periphery of the Site are likely to provide foraging and/or commuting habitat for local bat populations but will be unaffected by the proposed development.</p> <p>m. Habitats in the wider area such as woodland, potentially provide roosting, foraging and/or commuting habitat will be unaffected.</p> <p>n. Landscape planting will increase suitable foraging habitat for bats within the Site.</p> <p>o. It is proposed to include ten bat boxes on suitable trees around the Site, which together with proposed grassland creation, and hedgerow planting, will provide increased opportunities for roosting, foraging and commuting bats.</p>

Feature		Details
	Legislative Compliance – WCA**, HR***	p. Any lighting required during construction and/or operation should be directed away from woodland and scrub (further information is provided in <i>Lighting in the UK, Bats and the Built Environment Series</i> , Bat Conservation Trust and Institute for Lighting Engineers).
Badger	Constraints & Opportunities	q. No setts were identified within or immediately adjacent to the Site. However, the Site and surrounding habitats are considered suitable to support foraging badgers and potentially sett excavation.
	Legislative Compliance – PBA****	r. A pre-construction badger survey will be undertaken immediately prior to the commencement of development to check for any constructed setts in / within 30m of construction. s. If an active badger sett is identified within the Site or within approximately 30m, a suitable protection/mitigation strategy will be produced under the advice of an ecologist and if necessary, works in proximity to a sett will only proceed under a licence from Natural England.
Amphibians and Reptiles	Constraints & Opportunities	t. The development will result in the loss of agricultural grassland considered to be sub-optimal terrestrial habitat for amphibians and reptiles. No ponds will be directly affected by the proposals. u. It is considered that there will be no adverse effects on any local amphibian or reptile populations. v. The creation of species rich grassland and hedgerow planting, will benefit amphibian and reptiles potentially present in the future, creating additional foraging, commuting and hibernation habitat.
	Legislative Compliance - WCA*, HR**	w. RAMs will be employed to ensure no harm to individual amphibians or reptiles that may be using the site opportunistically.
Hazel dormouse	Constraints & Opportunities	x. Woodland and hedgerow habitats that may be used by hazel dormouse will not be impacted by the works. y. Landscape planting including trees and scrub will increase suitable habitat for this species within the Site.
	Legislative Compliance - WCA*, HR**	z. n/a
Other Species	Constraints & Opportunities	aa. Hedgehog, polecat and brown hare and may utilise the Site and adjacent land. However, the loss of a relatively small area of agricultural grassland is not likely to have any discernible effect on local populations, especially when considered in the context of the extensive availability of suitable habitats in the wider area. bb. The creation of new meadow grassland, scrub and tree planting will benefit these and other species including invertebrates by creating additional foraging, commuting and overwintering habitat.
	Legislative Compliance - WCA*	cc. n/a
	Constraints & Opportunities	dd. No invasive non-native species were recorded on or adjacent to the Site during the survey.

Feature		Details
Invasive Non-native Species	Legislative Compliance – WCA**	ee. If any invasive species be encountered onsite or immediately surrounding the Site prior to or during construction, suitable biosecurity measures will be implemented to prevent the inadvertent introduction or spread of such species.

***Legislative Compliance Key***

\* The Hedgerows Regulations 1997

\*\*Wildlife & Countryside Act 1981 (as amended)

\*\*\*The Conservation of Habitats and Species Regulations 2017 (as amended)

\*\*\*\*Protection of Badgers Act 1992

Figure 1: Site Location Plan

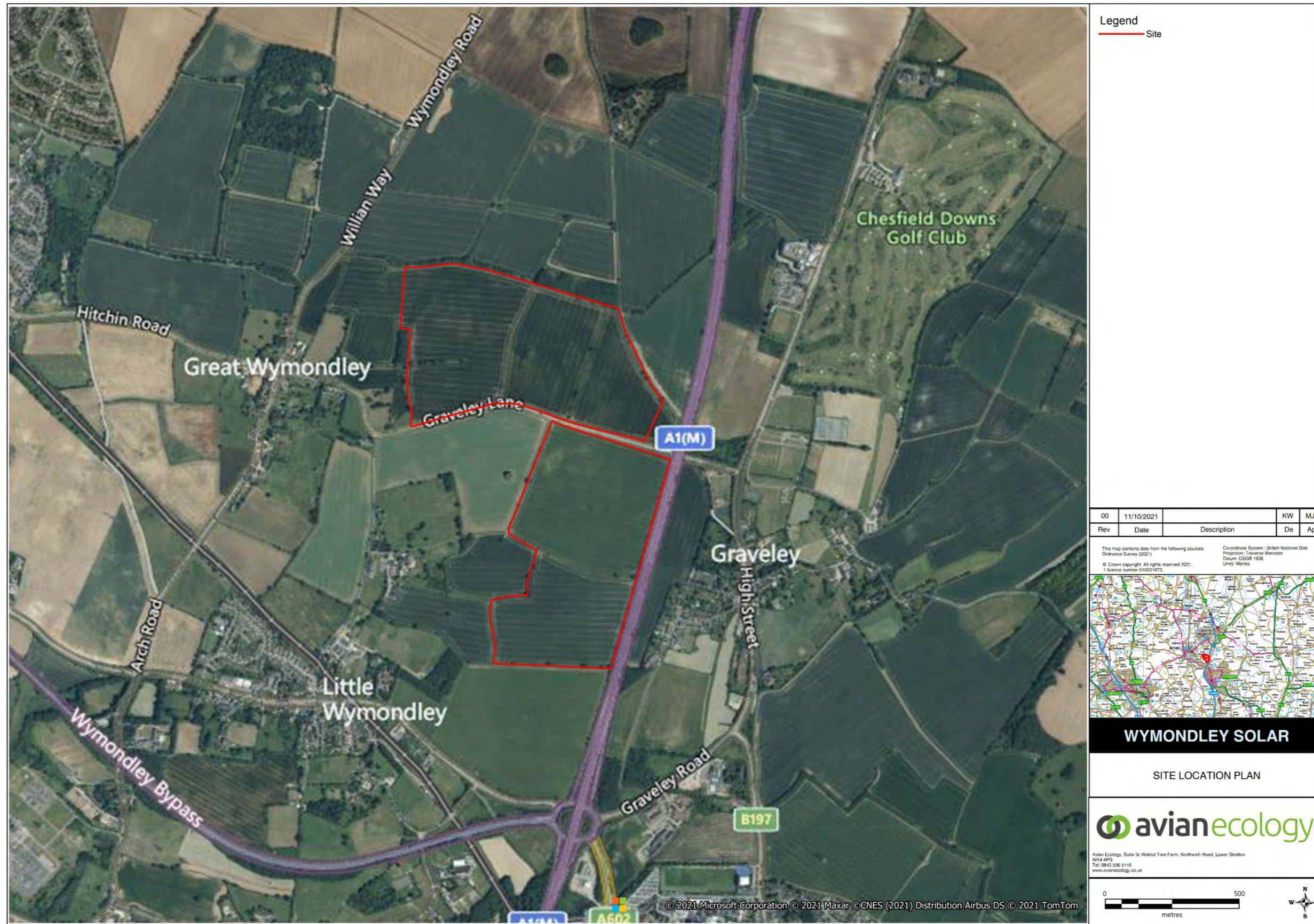


Figure 2: Statutory Designated Sites Plan

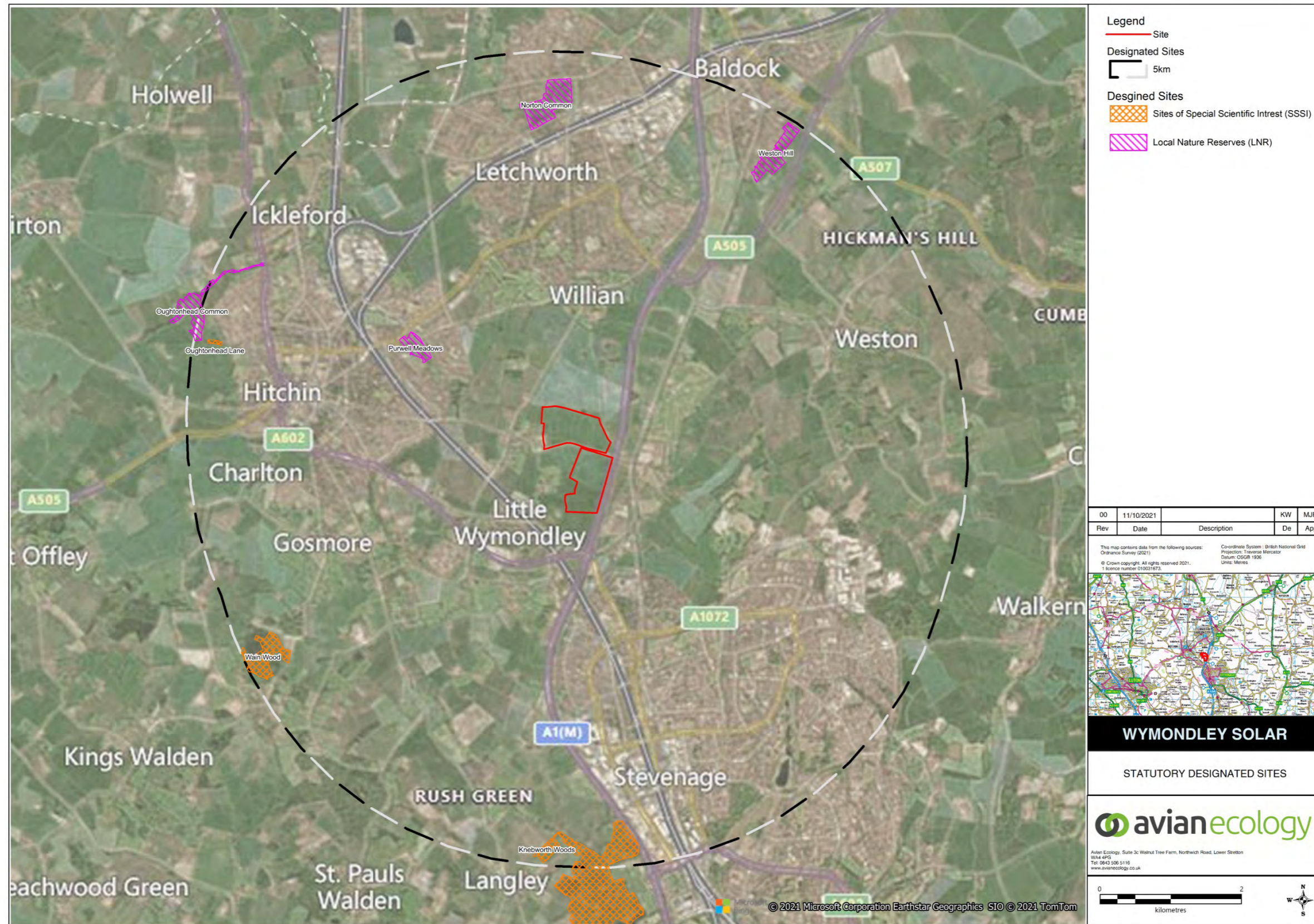


Figure 3: Non-statutory designated Sites Plan

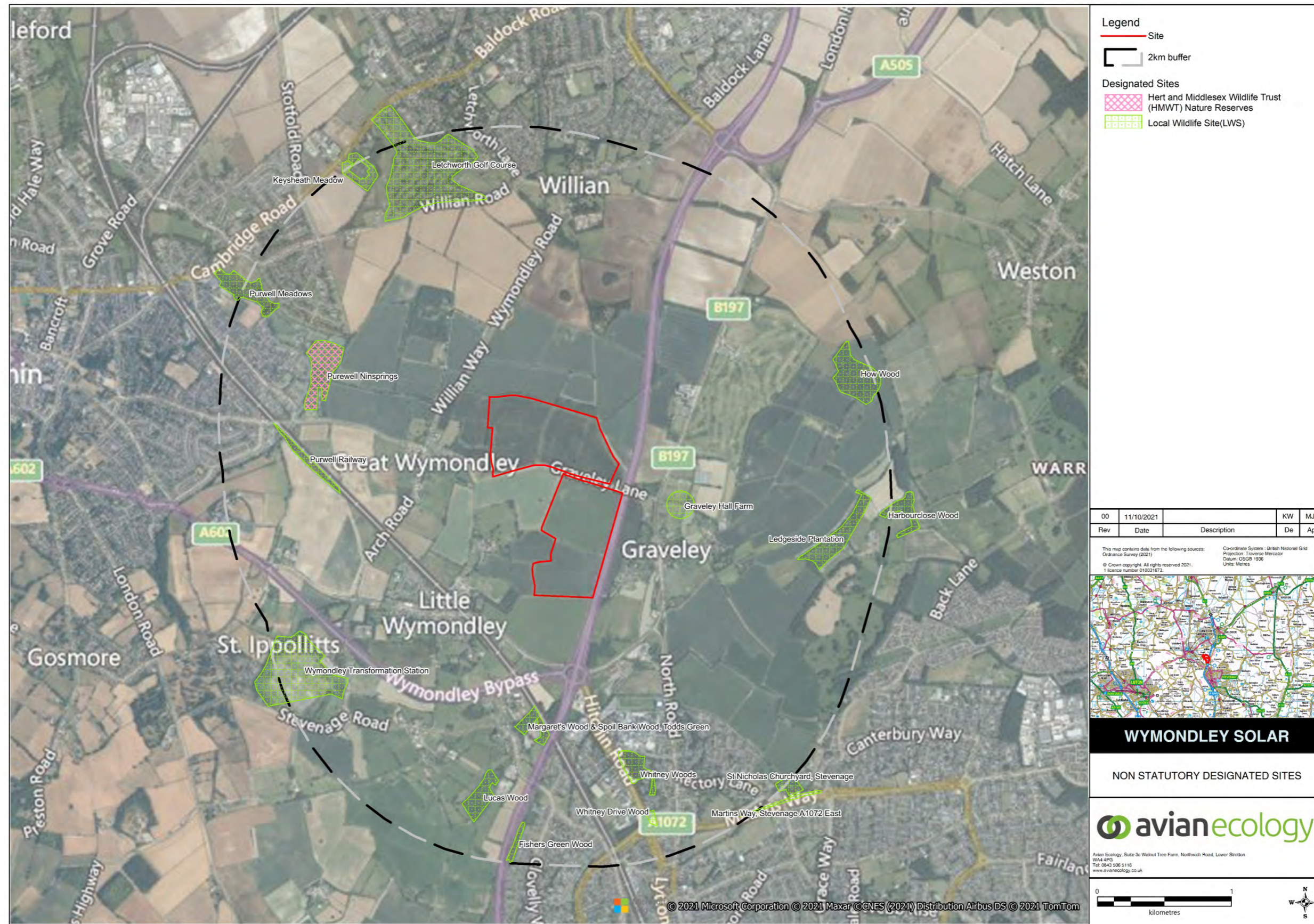
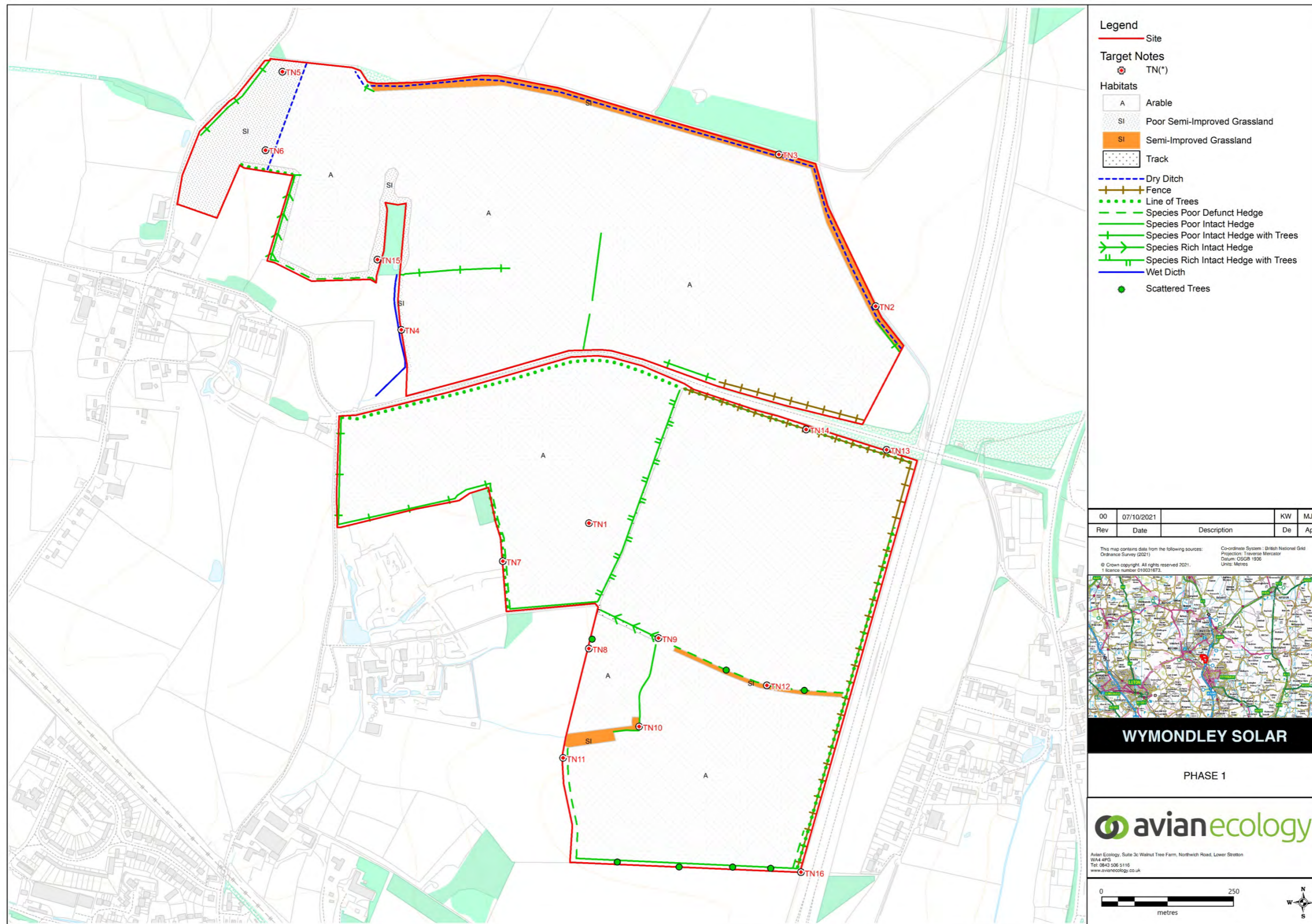


Figure 4: Phase 1 Habitat Survey Plan





**Figure 5: Pond Location Plan**

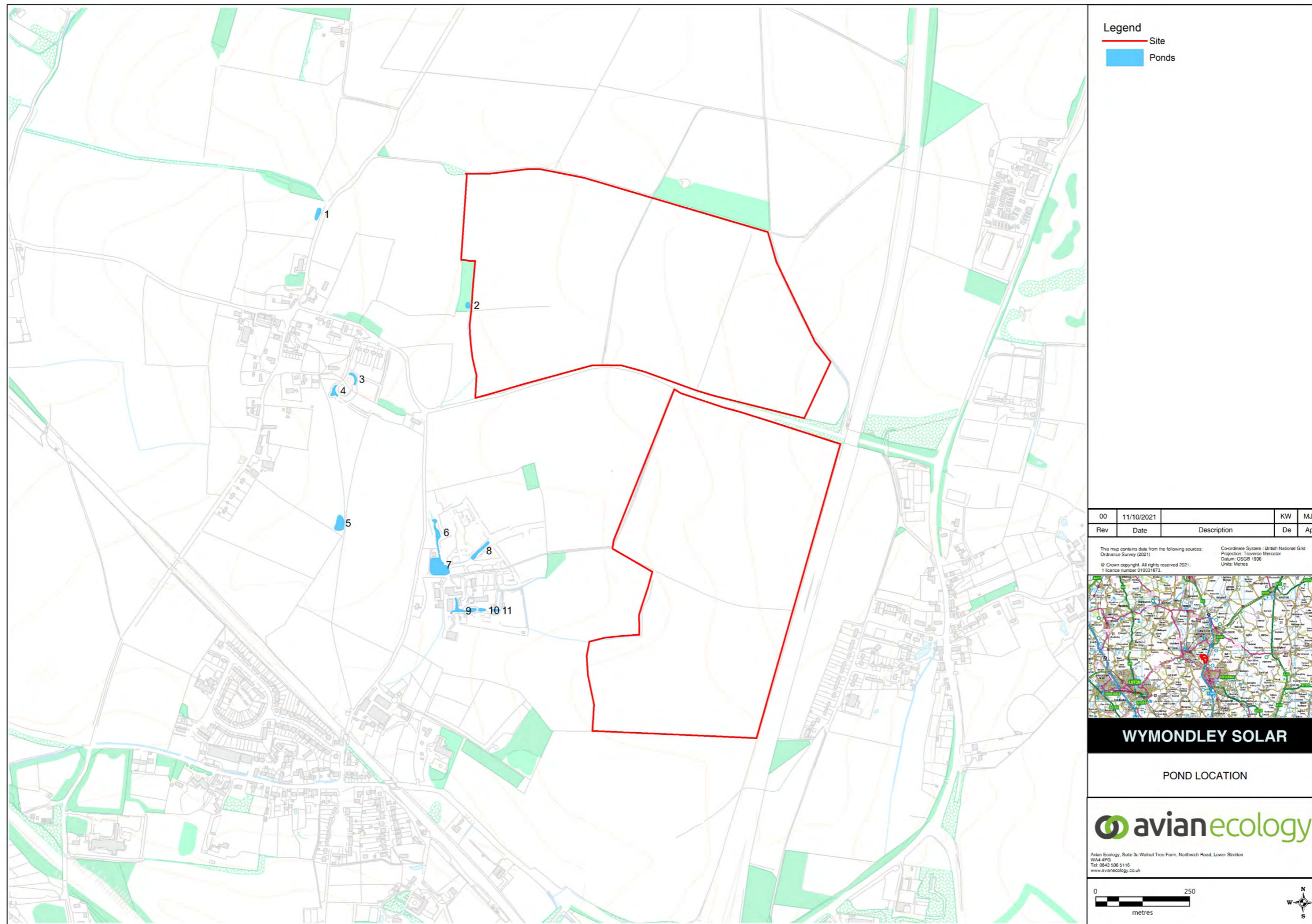
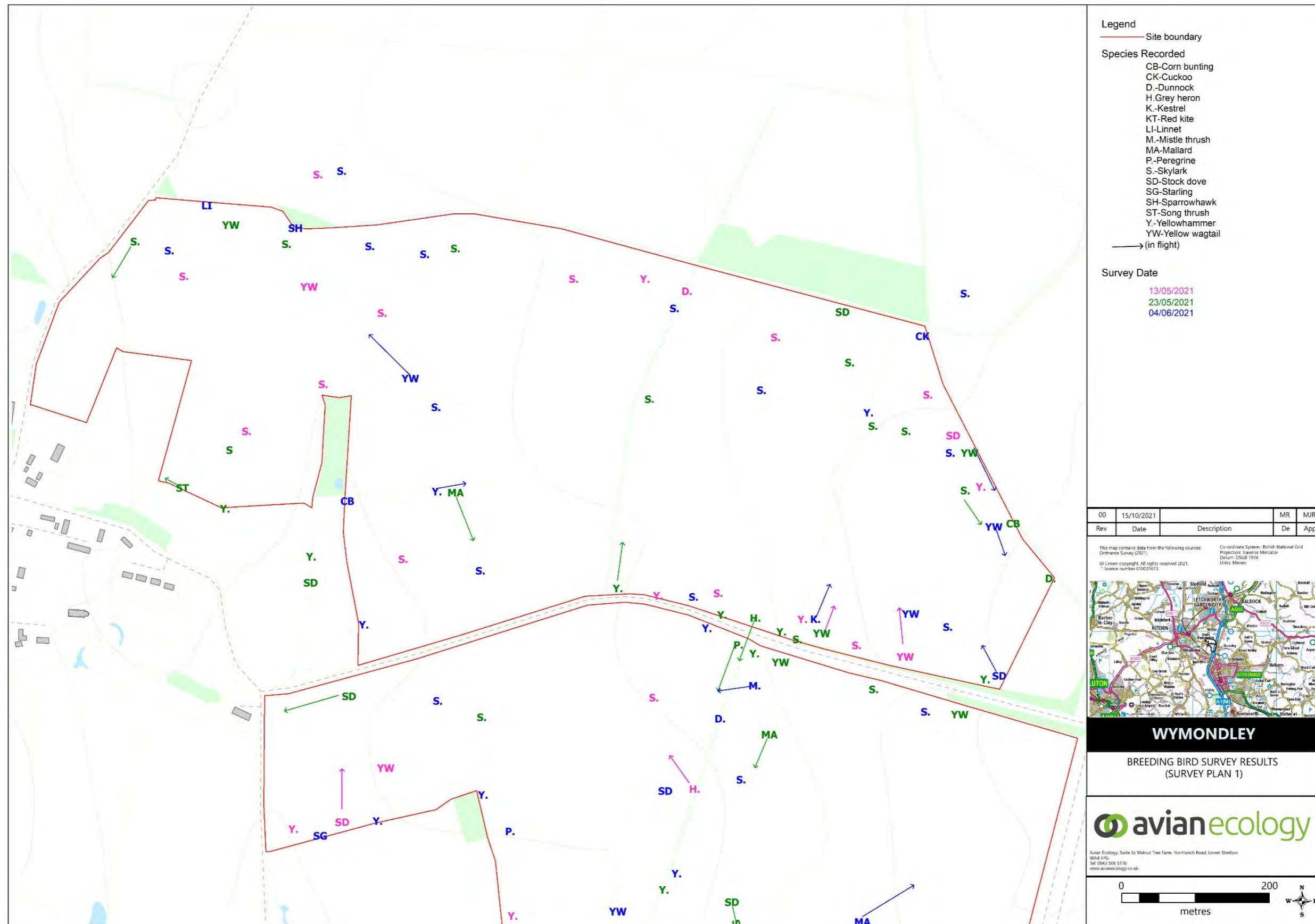


Figure 6: Breeding Bird Survey Plan





## APPENDIX 1: PHOTOGRAPHS

Photograph	Description
	<p><b>Photo 1:</b> Species rich semi-improved grassland to the north of the Site.</p>
	<p><b>Photo 2:</b> Species poor Improved grassland running along a shallow ditch.</p>
	<p><b>Photo 3:</b> Species poor Improved grassland running along a shallow ditch.</p>



**Photo 4:** Example of the arable fields within the Site.



**Photo 5:** Example of the arable fields within the Site.



**Photo 6:** Run off pipe in to the dry ditch adjacent to the south east corner.



**Photo 7:** Example of semi improved on the Site.



**Photo 8:** Example of semi improved on the Site.



**Photo 9:** Existing access track in the south section of the Site.



**Photo 10:** Example of species rich hedgerows on Site.



**Photo 11:** Example of defunct species poor hedgerow on Site.



**Photo 12:** Example of intact species poor hedgerow on Site.



## APPENDIX 3: NOTABLE SPECIES LIST

Common Name	Latin Name	Count
<b>Amphibians</b>		
Great Crested Newt	<i>Triturus cristatus</i>	2
Common Toad	<i>Bufo bufo</i>	9
<b>Birds</b>		
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	3793
Black-tailed Godwit	<i>Limosa limosa</i>	2
Brambling	<i>Fringilla montifringilla</i>	10
Buzzard	<i>Buteo buteo</i>	307
Canada Goose	<i>Branta canadensis</i>	287
Caspian Gull	<i>Larus cachinnans</i>	4
Coal Tit	<i>Parus ater</i>	161
Common Firecrest	<i>Regulus ignicapilla</i>	4
Common Gull	<i>Larus canus</i>	22
Common House Martin	<i>Delichon urbicum</i>	111
Common Merganser	<i>Mergus merganser</i>	1
Common Reed Bunting	<i>Emberiza schoeniclus</i>	60
Common Sandpiper	<i>Actitis hypoleucos</i>	2
Common Tern	<i>Sterna hirundo</i>	6
Corn Bunting	<i>Emberiza calandra</i>	21
Cuckoo	<i>Cuculus canorus</i>	19
Curlew	<i>Numenius arquata</i>	1
Dunnock	<i>Prunella modularis</i>	718
Egyptian Goose	<i>Alopochen aegyptiaca</i>	1
Eurasian Bittern	<i>Botaurus stellaris</i>	1
Eurasian Blue Tit	<i>Cyanistes caeruleus</i>	1741
Eurasian Bullfinch	<i>Pyrrhula pyrrhula</i>	125
Eurasian Nuthatch	<i>Sitta europaea</i>	55
Eurasian Skylark	<i>Alauda arvensis</i>	178
Eurasian Wren	<i>Troglodytes troglodytes</i>	341

Common Name	Latin Name	Count
European Green Woodpecker	<i>Picus viridis</i>	266
European Herring Gull	<i>Larus argentatus</i>	44
Fieldfare	<i>Turdus pilaris</i>	59
Goldcrest	<i>Regulus regulus</i>	163
Goldfinch	<i>Carduelis carduelis</i>	2278
Grasshopper Warbler	<i>Locustella naevia</i>	10
Great Black-backed Gull	<i>Larus marinus</i>	3
Great Spotted Woodpecker	<i>Dendrocopos major</i>	227
Great Tit	<i>Parus major</i>	1153
Green Sandpiper	<i>Tringa ochropus</i>	2
Greenfinch	<i>Chloris chloris</i>	579
Grey Heron	<i>Ardea cinerea</i>	158
Grey Partridge	<i>Perdix perdix</i>	78
Grey Plover	<i>Pluvialis squatarola</i>	32
Grey Wagtail	<i>Motacilla cinerea</i>	90
Greylag Goose	<i>Anser anser</i>	19
Hawfinch	<i>Coccothraustes coccothraustes</i>	4
Hobby	<i>Falco subbuteo</i>	13
House Sparrow	<i>Passer domesticus</i>	2313
Jack Snipe	<i>Lymnocyptes minimus</i>	1
Kestrel	<i>Falco tinnunculus</i>	177
Kingfisher	<i>Alcedo atthis</i>	77
Lapwing	<i>Vanellus vanellus</i>	15
Lesser Black-backed Gull	<i>Larus fuscus</i>	131
Lesser Redpoll	<i>Acanthis cabaret</i>	9
Lesser Spotted Woodpecker	<i>Dryobates minor</i>	4
Linnet	<i>Linaria cannabina</i>	84
Little Egret	<i>Egretta garzetta</i>	509
Little Owl	<i>Athene noctua</i>	30
Mallard	<i>Anas platyrhynchos</i>	1935

Common Name	Latin Name	Count
Marsh Tit	<i>Poecile palustris</i>	16
Meadow Pipit	<i>Anthus pratensis</i>	30
Mediterranean Gull	<i>Ichthyaetus melanocephalus</i>	2
Merlin	<i>Falco columbarius</i>	3
Mistle Thrush	<i>Turdus viscivorus</i>	80
Moorhen	<i>Gallinula chloropus</i>	1059
Mute Swan	<i>Cygnus olor</i>	103
Nightingale	<i>Luscinia megarhynchos</i>	1
Peregrine	<i>Falco peregrinus</i>	150
Pied Wagtail	<i>Motacilla alba</i>	524
Red Kite	<i>Motacilla alba yarrellii</i>	306
Redstart	<i>Milvus milvus</i>	2
Redwing	<i>Phoenicurus phoenicurus</i>	106
Ring-necked Parakeet	<i>Turdus iliacus</i>	21
Robin	<i>Psittacula krameri</i>	1854
Sand Martin	<i>Erithacus rubecula</i>	3
Short-eared Owl	<i>Riparia riparia</i>	2
Shoveler	<i>Asio flammeus</i>	1
Siskin	<i>Spatula clypeata</i>	34
Snipe	<i>Spinus spinus</i>	8
Song Thrush	<i>Gallinago gallinago</i>	369
Sparrowhawk	<i>Turdus philomelos</i>	132
Spotted Crake	<i>Accipiter nisus</i>	1
Spotted Flycatcher	<i>Porzana porzana</i>	9
Spotted Redshank	<i>Muscicapa striata</i>	1
Starling	<i>Tringa erythropus</i>	4958
Stock Dove	<i>Sturnus vulgaris</i>	134
Stonechat	<i>Columba oenas</i>	2
Swallow	<i>Saxicola rubicola</i>	140
Swift	<i>Hirundo rustica</i>	596

Common Name	Latin Name	Count
Tawny Owl	<i>Apus apus</i>	45
Teal	<i>Strix aluco</i>	1
Tree Pipit	<i>Anas crecca</i>	1
Tree Sparrow	<i>Anthus trivialis</i>	4
Treecreeper	<i>Passer montanus</i>	34
Tufted Duck	<i>Certhia familiaris</i>	49
Turtle Dove	<i>Aythya fuligula</i>	3
Water Rail	<i>Streptopelia turtur</i>	12
Western Barn Owl	<i>Rallus aquaticus</i>	10
Western Marsh Harrier	<i>Tyto alba</i>	1
Western Osprey	<i>Circus aeruginosus</i>	3
Western Yellow Wagtail	<i>Pandion haliaetus</i>	40
Wheatear	<i>Motacilla flava</i>	18
Whinchat	<i>Oenanthe oenanthe</i>	2
White Stork	<i>Saxicola rubetra</i>	1
White Wagtail	<i>Ciconia ciconia</i>	1
Wigeon	<i>Motacilla alba alba</i>	1
Willow Warbler	<i>Mareca penelope</i>	43
Wood Sandpiper	<i>Phylloscopus trochilus</i>	1
Woodcock	<i>Tringa glareola</i>	10
Wryneck	<i>Scolopax rusticola</i>	2
Yellowhammer	<i>Jynx torquilla</i>	162
<b>Bats</b>		
Brown Long-eared Bat	<i>Plecotus auritus</i>	2
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	5
Long-eared Bat species	<i>Plecotus</i>	4
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	1
Noctule Bat	<i>Nyctalus noctula</i>	2
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	2
Unidentified Bat	<i>Myotis</i>	1

Common Name	Latin Name	Count
<b>Mammals</b>		
Eurasian Badger	<i>Meles meles</i>	77
Brown Hare	<i>Lepus europaeus</i>	1
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	56
European Otter	<i>Lutra lutra</i>	1
European Water Vole	<i>Arvicola amphibius</i>	12
Polecat	<i>Mustela putorius</i>	4
Weasel	<i>Mustela nivalis</i>	1
West European Hedgehog	<i>Erinaceus europaeus</i>	27
<b>Invasive</b>		
American Signal Crayfish	<i>Pacifastacus leniusculus</i>	2
Canada Goose	<i>Branta canadensis</i>	287
Chinese Muntjac	<i>Muntiacus reevesi</i>	11
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	56
Egyptian Goose	<i>Alopochen aegyptiaca</i>	1
Indian Balsam	<i>Impatiens glandulifera</i>	17
Japanese Knotweed	<i>Fallopia japonica</i>	3
Montbretia	<i>Crocsmia pottsii x aurea = C. x crocosmiiflora</i>	1
Ring-necked Parakeet	<i>Milvus milvus</i>	306
Virginia-creeper	<i>Parthenocissus quinquefolia</i>	1
Wall Cotoneaster	<i>Cotoneaster horizontalis</i>	1
Yellow Archangel	<i>Lamium galeobdolon subsp. argentatum</i>	6