Cotmoor Solar Farm
on behalf of JBM Solar Projects 6 Ltd

Ecological Assessment Report

avian ecology

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1 INTRODUCTION

1.1 Background

1.1.1 Avian Ecology Ltd. was commissioned in December 2019 by JBM Solar Projects 6 Ltd to undertake an Ecological Assessment in relation to the proposed solar development, battery stations and associated infrastructure on land at Cotmoor Solar Farm, Halloughton, Nottinghamshire henceforth referred to as 'the Site' as illustrated on **Figure 1**.

1.1.2 Also forming part of the overall redline boundary is a small off-site area of land which has been identified as an 'area for biodiversity'. This lies outside the proposed development footprint, and is included within the redline as it will form part of the overall proposed biodiversity mitigation and enhancement measures. This area will not be impacted by any development works and is not part of the assessed Site.

1.1.3 The objectives of this report are:

- Provide baseline information on the current habitats and ecological features both within the Site and immediate surrounding area;
- Identify the proximity of any designated sites for nature conservation interest and provide an assessment of any potential effects the proposed development may have on these;
- Identify the presence or potential presence of any protected species or habitats and provide an assessment of any potential effects the proposed development may have on these; and,
- Provide recommendations for further pre-construction checks and / or mitigation measures, if required.

1.1.3 The Assessment has comprised a desk based review, Extended Phase 1 habitat survey, preliminary (bat) roost assessment of trees, wintering bird survey, great crested newt Habitat Suitability Index (HIS) assessment and great crested newt environmental-DNA (eDNA) survey.

1.1.5 The Assessment refers to relevant legislation, planning policy and guidance as appropriate.

1.1.6 This Ecological Assessment report should be read in conjunction with the *Site Layout and Planting Proposals Plan*.

1.2 Site Overview

1.2.1 The Site comprises of an area of approximately 107.81ha located to the north west of Halloughton and west of the town of Newark-on-Trent. The Site is located within an agricultural landscape with Halloughton Wood situated adjacent to the south west of the Site.

1.2.2 Habitats within the Site include arable, improved grassland, poor semi-improved grassland, watercourses, waterbodies, woodland, scrub, hedgerows and scattered trees.

1.2.3 In the wider context the Site is surrounded by agricultural land interspersed with broadleaved woodland. The village of Halloughton is situated to the south east, the town of Southwell to the north east and occasional farm dwellings lie in the wider area.

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**.

Table 1.1: Key legislation, planning policy and guidance.

European
• Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the 'Habitats Directive'); and, • Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (hereafter referred to as the 'Birds Directive'). • Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species
National
• The 'Conservation of Habitats and Species Regulations 2017 (as amended)'. Note this may also be referred to as the 'Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM)[1] is to continue with the 2017 reference at this time. For the purposes of this report these two references are interchangeable and hereafter referred to as the 'Habitat Regulations' • The Environment Bill 2020 (currently in passage and therefore not yet adopted); • 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 2 (NPPF2, 2019); • The Defra Biodiversity Metric 2.0[2]; • 'Birds of Conservation Concern 4' (Eaton *et al*., 2015)[1]; • The United Kingdom Biodiversity Action Plan (UK BAP); • The Bat Conservation Trust - *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.).* (Collins *et al.*, 2016[2]); and • BS 42020:2013 Biodiversity – Code of Practice for Planning and Development; • Infrastructure Act 2015.
Local
• Nottinghamshire Biodiversity Action Plan (2015)[3]

1.3.2 The 'UK Post-2010 Biodiversity Framework' succeeds the UK Biodiversity Action Plan (UK BAP) and 'Conserving Biodiversity – the UK Approach'. Although BAPs are now largely superseded, 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

[1] https://cieem.net/referencing-environmental-eu-legislation-post-brexit/
[2] http://publications.naturalengland.org.uk/publication/5850908674228224
1 Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D,. Stroud, D. and Gregory, R (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108, pp708-746.
2 Collins *et al.* (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd edition, BCT: London
3 http://www.nottsbag.org.uk/projects.htm#bap

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 Recent 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 Conservation of Species and Habitats Regulations 2017 (as amended) ('the Habitat Regulations'). This makes it an offence to:

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

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 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*'[4]. Natural England sought (on DEFRA's behalf) wide ranging views on whether four new policies could be permitted under licence to benefit EPS whilst improving flexibility for development. Following from this consultation period, Natural England officially introduced the four licensing policies throughout England[5].

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 new 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 2017 (as amended) legal framework now applies to 'local populations' of EPS and not individuals/site populations.

[4] https://www.gov.uk/government/consultations/wildlife-licensing-comment-on-NEw-policies-for-european-protected-species-licences
[5] https://www.gov.uk/government/news/new-licensing-policies-great-for-wildlife-great-for-business

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.

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[6]. A 5km search radius surrounding the Site boundary was adopted for all statutory designated sites, extending to 10km for International protected sites. The locations of statutory designated sites are provided in **Figure 2**.

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

2.1.4 Biological records data on non-statutory designated sites and records of protected and notable species was requested from the Nottinghamshire Biological and Geological Records Centre. A 2km search radius was used from the Site. The locations of non-statutory designated sites located within 2km of the Site are provided in **Figure 3**.

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

2.2 Field Survey

Extended Phase I Habitat Survey

2.2.1 An Extended Phase 1 habitat survey of the Site was undertaken on the 9th January 2020 by experienced Ecologists Mr A Morley & Mr Z Hinchcliffe. The survey followed UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010)[7]. The extent of the Site is detailed in **Figure 1.**

2.2.2 Habitats within the Site were mapped and described using a series of 'target notes' (TNs). 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.

2.2.3 The habitats recorded within the Site and associated target notes are provided in **Figure 4**.

Preliminary Bat Roost Assessment

2.2.4 The Extended Phase 1 habitat survey included a preliminary roost assessment of trees located in and immediately adjacent to the Site, to identify and record any suitable bat roost potential. Trees were

[6] http://www.magic.defra.gov.uk
[7] JNCC (2010). Handbook for Phase I Habitat Survey – a Technique for Environmental Audit. JNCC, Peterborough

subject to a preliminary ground-based assessment to look for features that bats could use for roosting purposes and assess roost potential; their suitability for roosting bats was classified as follows (from Collins *et al*., 2016[8]):

- **Negligible**: Negligible habitat features on site likely to be used by roosting bats.
- **Low**: A structure with one or more potential roost sites that could be used by bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection and appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats.

  A tree of sufficient size and age to contain potential roost features but with none seen from the ground or with only very limited potential.

- **Moderate**: A tree or structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
- **High**: A tree or structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Winter Bird Survey

2.2.5 A single wintering bird survey was undertaken on the 9th January 2020 by experienced ornithologists Mr A Morley and Mr Z Hinchcliffe. Please refer to **Appendix 3** for survey effort. Wintering bird surveys are generally undertaken between October and March where required, for example at locations where there is a likelihood of high levels of bird use by species associated with a designated site such as a Special Protection Area (SPA). This Site does not lie within an important bird area, nor does it provide functionally linked land for any internationally designated site which has migratory and/or wintering wetland birds as qualifying species (no such sites within 15km). However, to contribute to the ecological baseline, a single wintering bird survey was undertaken.

2.2.6 The survey area comprised of the habitats within the Site, and 'Wider Survey Area' defined as the surrounding fields within a buffer of 600m, as shown in **Figure 6**. These areas consisted of arable and pasture fields. The wider survey area around the Site was viewed from public land including roads and footpaths.

2.2.7 The survey was directed at Target Species of bird, namely wetland bird species, principally waders, waterfowl and gulls, and Annex 1/Schedule 1 raptors. Furthermore, records were also made of Secondary Species, which consisted of non-Annex 1/Schedule 1 raptors and owl, notable flocks of non-wetland Birds of Conservation Concern (BoCC Amber and Red List Species (Eaton *et al.* 2015[9]) and Worcestershire Local Biodiversity Action Plan (LBAP)[10][11] species.

2.2.8 One visit was completed with 'walk-over' surveys adopting the 'look-see' methodology (Gilbert et al. 1998[12]), observing each field, walking the boundaries and stopping at intervals and scanning the

[8] Collins. J (ed). (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd ed). The Bat Conservation Trust, London.

[9] Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R. (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* 108: 708-746.

[10] http://www.worcestershire.gov.uk/downloads/file/10847/s6_nightingale_species_action_plan

[11] http://www.worcestershire.gov.uk/downloads/file/10865/s20_farmland_birds_species_action_plan

[12] Gilbert G, Gibbons D.W. and Evans J. (1998) *Bird Monitoring Methods*. RSPB Sandy.

fields for Target Species, with binoculars. All Target Species heard or seen were recorded onto basemaps. The number of Secondary Species was tallied during the survey, although no attempt to map these species was made.

2.2.9 The survey was undertaken during daylight hours in weather conditions conducive for bird surveys.

Great crested newt Habitat Suitability Index and Environmental DNA Survey

2.2.10 HSI and e-DNA surveys were undertaken on the 7th May. Full methodology can be found in the Great Crested Newt Presence or Absence (eDNA) survey report (**Appendix 2**) and a pond plan is provided in **Figure 5**.

Limitations of Survey

2.2.11 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).

2.2.12 The survey visit was undertaken in January and therefore outside of the optimal period for botanical surveys (approximately April to September). However, due to the habitats present (primarily managed agricultural land) it is not considered that this presents a significant constraint to the objectives of the survey.

3 BASELINE

3.1 Designated and Sites for Nature Conservation

Statutory Designated Sites

3.1.1 A review of MAGIC confirmed that the Site is not located within any statutory designated site for nature conservation. The search identified one statutory designated site located within a 5km radius and no European sites within 10km of the Site boundaries.

3.1.2 The Site is located within an SSSI Impact Risk Zones (IRZ); however, at this location, the development type does not meet the criteria which require consultation with Natural England (which is restricted to aviation proposals, livestock and poultry units as well as slurry lagoons).

3.1.3 The locations of statutory sites in relation to the Site are identified in **Figure 2**. Information regarding statutory designated sites is presented **Table 3.1** below.

Table 3.1: Statutory Designated Site within 5km

Site Name	Distance and Direction from Site	Reason for designation
Newhall Reservoir Meadow SSSI	1.7km north west	Newhall Reservoir Meadow SSSI is one of the best remaining examples of calcareous grasslands in Nottinghamshire supporting a number of uncommon orchids in the East Midlands.

Non-statutory Designated Sites

3.1.4 A review of the data provided by Nottinghamshire Biological and Geological Records Centre confirms one non-statutory designated site for nature conservation; Westhorpe Dumble Local Wildlife Site (LWS) is situated within the Site boundary. An additional nine LWS's and three "candidate botanical Local Wildlife Sites" (CLWS) are located within a 2km radius of the Site. This includes three LWSs adjacent to the Site's south western and western boundaries.

3.1.5 These are described in **Table 3.2** below. The location of all non-statutory designated sites within 2km of the Site boundaries is provided in **Figure 3**.

Table 3.2: Non-statutory Designated Sites within 2km (LWS: Local Wildlife Site)

Site Name	Distance and Direction from Site	Description
Westhorpe Dumble LWS	Within the Site	A characteristic dumble (wooded stream).
Halloughton Wood LWS	Adjacent to the south west of the Site	An old woodland site.
Cotmoor Lane LWS	Adjacent to the south west of the Site	Broad wooded trackside verges.
Westhorpe Dumble Head Drain LWS	Adjacent to the west	An association of uncommon grassland species on the banks of a drain.
Radley House Scrub CLWS	70m west	Woodland.

Cotmoor Plantation LWS	0.3km west	A damp deciduous woodland.
Brackenhurst LWS	0.4km west	A notable array of herb species in an ornamental setting with a pond of importance.
Halloughton Verge LWS	0.6km south east	A herb rich roadside verge.
Oxton Road Woodland CLWS	0.6km west	Plantation woodland.
Halloughton Dumble LWS	0.6km south west	A long and striking landscape feature with characteristic woodland plant communities.
Radley Lane Dumble LWS	0.6km north west	Woodland and scrub along a stream cutting.
Radley Road Grassland CLWS	0.65m north west	Species rich grassland.
Epperstone Dumble (North) LWS	1.7km south west	A notable dumble.

3.2 Priority Habitats

3.2.1 Five habitats of Principal Importance under Section 41 of the NERC Act/UK Biodiversity Action Plan and/or Nottinghamshire Biodiversity Action Plan habitats were identified within 2km of the Site including ponds, lowland meadows/lowland neutral grassland, traditional orchards, lowland fens and lowland mixed deciduous woodland.

3.2.2 The Magic website, Ordinance Survey Maps and the Nottinghamshire Biodiversity Action Plan provided records of one priority habitat within the Site boundary; lowland mixed deciduous woodland and one priority habitat is located on the Site's boundaries.

3.2.3 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

Priority habitat name	Designation	Distance from site
Lowland mixed deciduous woodland	NERC S.41, UKBAP, LBAP	Within the Site
Ponds	NERC S.41, UKBAP	On the Site boundary
Traditional orchard	NERC S.41, UKBAP	C1.1km north east
Lowland meadows	NERC S41, UKBAP, LBAP	c1.3km north west
Lowland Fens	NERC S.41, UKBAP, LBAP	c1.8km north east

Key

NERC S.41: Natural Environment and Rural Communities (NERC) Act (2006); **UKBAP**: UK Biodiversity Action Plan Priority Habitat; **LBAP:** Nottinghamshire Biodiversity Action Plan priority habitat

3.3 Habitats

3.3.1 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 1**.

3.3.2 The Site occupies land totalling approximately 106ha set within a rural landscape. Habitats within the Site comprise arable fields, improved grassland, poor semi improved grassland, woodland ditches , hedgerows and a waterbody on the boundary.

3.3.3 The dominant habitat type within the Site is arable farmland. A number of these fields are bordered by hedgerows which were species poor in nature and varied from intact to defunct/gappy across the Site. In addition one hedgerow contained mature oak *Quercus sp* trees. Species commonly present include hawthorn *Crataegus monogyna* and elder *Sambucus nigra*. A small area of dense scrub is present to the east of the Site consisting of willow saplings *Salix sp.*

3.3.4 A triangular area of woodland is present to the south-east of the Site (TN6 shown on Figure 4) consisting of mature mixed plantation woodland. Species present includes common ash *Fraxinus excelsior*, birch *Betula sp* and bramble *Rubus fruticosus agg.* understorey.

3.3.5 Two fields contain small strips of semi-improved grassland at TN7 and TN8. These areas are used for set aside with cover for game birds and winter seed for winter passerines. Improved grassland is also situated to the south of the Site with horse paddocks present in association with these fields.

3.3.6 Ditches (both dry and wet at the time of survey) are located within and/or along field boundaries of the Site. Thre waterbodies are located in close proximity to the Site, P5 on the northern boundary, P16 to the south west and P3 to the south east of the Site, see **Figure 5**. From aerial imagery and OS maps an additional eighteen waterbodies were highlighted within 250m of the Site, **Figure 5**.

3.3.7 Habitats recorded within the Site are considered to be typical of the wider landscape.

Table 3.4: Target Notes

Target Note	Comment	Photograph
TN1	Broad leaved plantation with open understorey and young trees comprising of pedunculate oak *Quercus robur*, ash, birch and the occasional conifer.	**TN1 pic 1**
TN2	Species poor intact hedge row approximately 1.5m tall. Species present include hawthorn and elder and the hedge had recently been cut and shaped. A dry ditch runs alongside the hedgerow.	**TN2 pic 1**
TN3	Ditch appeared to be less than 1m deep and contained running water at the time of the survey. It has steep sides and is vegetated by sedges *Carex sp* and willowherb *Epilobium sp*. This ditch leads into a large pond situated outside of the site and then out again at the opposite side. The depth of the pond could not be determined due to limitations from steep banks but it appeared to be deep. The pond was surrounded by steep banks that were open with very little vegetative cover.	**TN3 pic 1 & pic 2**
TN4	Extensive arable field that has been recently tilled with bare soil and remnants of dead crops throughout.	**TN4 pic 1**
TN5	Improved grassland with species present includes dominant Yorkshire fog *Holcus lanatus* with scattered mature pedunculate oak trees.	**-**
TN6	Mature mixed plantation woodland with species present including ash and birch. Understorey comprises of dense bramble scrub and log piles. It contains mature trees which are approximately 6-9 meters in height.	**TN6 pic 1, 2 & 3**

Target Note	Comment	Photograph
TN7	Semi-improved grassland set aside area with cover for game birds and winter seed for wintering passerines.	**TN7 pic 1**
TN8	Same as TN7.	-
TN9	Mature large hedgerow, comprising of predominantly hawthorn with elder and mature pedunculate oak trees. The hedgerow is over 6m in height and 2m wide, mature in age and appeared to be unmanaged.	**TN9 pic 1**
TN10	Large mature defunct hedgerow comprising of predominantly hawthorn and elder. The hedgerow was approximately 7m high and 1.5 m wide.	**TN10 pic 1**
TN11	Extensive reedbed area (outside Site boundary) covering several large fields containing dominant common reed *Phragmites australis* which appears to be being grown as a crop.	**TN11 pic 1**
TN12	Small pond containing standing water. Pond edges are heavily vegetated with hawthorn, willowherb and goat willow *Salix caprea*.	**TN12 pic 1**
TN13	Improved pasture and horse paddocks.	**TN13 pic 1**
TN14	Extensive broadleaved woodland contains mature species including ash, oak, birch and the occasional conifer tree.	-
TN15	Flowing ditch with steep earth banks.	**TN15 pic 1**
TN16	Flowing ditch with steep earth banks and secondary flow from tributary in the south east corner of Field 1.	**TN16 pic 1**
TN17	Newly planted willow *Salix sp* scrub.	**TN17 pic 1**
TN18	Deciduous woodland either side of the flowing ditch dominated by hazel *Corylus avellana*, willow *Salix sp*, hawthorn, pedunculate oak, elder, poplar *Populus sp* and ash.	**TN18 pic 1**
TN19	Willow and ash dominated woodland bordering flowing ditch.	**TN19 pic 1**
TN20	Hawthorn dominated hedgerows with additional sycamore *Acer psuedoplantus* and elder.	-
TN21	Mixed plantation woodland with pedunculate oak, ash, hawthorn, blackthorn *Prunus spinosa*, hazel and pine *Pinus sp*.	**TN21 pic 1**
TN22	Row of pedunculate oak along fenceline.	**TN22 pic 1**
TN23	Defunct hawthorn dominated hedgerow	-
TN24	Willow and hawthorn dominated hedgerow	-

3.4 Protected and Notable Species

3.4.1 Species considered pertinent in the context of the proposed development are referenced in the corresponding sections below.

Birds

3.4.2 The data search requested from the NBGRC returned a number of bird records within the 2km search radius, including two Schedule 1 species as listed on the Wildlife and Countryside Act 1981 (as amended); fieldfare *Turdus pilaris* (three records), and hobby *Falco subbuteo* (one record).

3.4.3 Records received of priority species commonly associated with arable and pastoral farmland include lapwing *Vanellus vanellus*, grey partridge *Perdix perdix*, linnet *Linaria cannabina* and sky lark *Alauda arvensis* which may also potentially breed or forage on land within and surrounding the Site boundary.

3.4.4 Hedgerows and scattered trees located along field boundaries are considered likely to provide opportunities for arboreal nesting bird species and the arable crop fields (with grassland field margins) may potentially offer opportunities for ground nesting birds species such as lapwing and skylark. Further nesting habitats are potentially located in woodland habitats both within and adjacent to the Site. Arable and pasture habitats present within the Site and wider area could also be utilised by wintering bird species.

3.4.5 During the winter walk-over survey bird activity of both Target and Secondary Species within the Site was very low. One Target Species (woodcock *Scolopax rusticola*) and four Secondary Species (redwing *Turdus iliacus,* reed bunting *Emberiza schoeniclus*, starling *Sturnus vulgaris* and fieldfare *Turdus pilaris*) were recorded. Results for within the Site are summarised in **Table 3.5.**

3.4.6 No Target Species were recorded within the Wider Survey Area (fields surrounding the Site) and two Secondary Species (fieldfare and dunnock *Prunella modularis*) were observed. Results for within the wider survey area are summarised in **Table 3.6**.

3.4.7 Only fields containing Target and Secondary Species are shown; all other fields had no Target or Secondary species recorded.

3.4.8 Detailed locations of the Target Species are presented in **Figure 7**.

Table 3.5: Winter walk-over survey results – The Site

Field Number	Species	Number seen	Conservation Status
Target Species			
18	**Woodcock**	**1**	**BoCC- Red, LBAP**
Secondary Species			
12	Redwing	1	S1, BoCC - Red
13	Fieldfare	4	S1, BoCC - Red
14	Redwing	20	S1, BoCC - Red
14	Fieldfare	15	S1, BoCC - Red
15	Reed bunting	1	S41, BoCC – Amber, LBAP
15	Starling	14	S41, BoCC – Red, LBAP
Primary target species recorded in bold			

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

S41 - Species listed on Section 41 of the NERC Act

BoCC – Species listed on the Birds of Conservation Concern

LBAP – Nottinghamshire Local Biodiversity Action Plan species

Table 3.6: Winter walk-over survey results- Wider Survey Area

Field Number	Species	Number seen	Conservation Status
No Target species recorded			
Secondary Species			
42	Fieldfare	2	S1, BoCC – Red
19	Dunnock	1	S41, BoCC – Amber, LBAP

Primary target species recorded in bold

'-' means no observations recorded during survey

Conservation Status

S1 - Birds listed on Schedule 1 of the Wildlife and Countryside Act

S41 - Species listed on Section 41 of the NERC Act

BoCC – Species listed on the Birds of Conservation Concern

LBAP – Nottinghamshire Local Biodiversity Action Plan species

Bats

3.4.9 Data provided by the Nottinghamshire Bat Group returned records of two hundred and thirty-seven bats within 2km of the Site. Species present includes Brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri, Myotis* sp, Noctule *Nyctalus noctula*, Pipistrelle sp *Pipistrellus sp*, and Soprano pipistrelle *Pipistrellus pygmaeus*. The closest record was situated 0.24km from the Site and related to a common pipistrelle which was seen on a bat transect survey.

3.4.10 The MAGIC website showed three European Protected Species mitigation licences granted for developments which affect bat roosts within 2km of the Site boundaries. The closest of which relates to licence (2017-30098-EPS-MIT) relates to 2017 for the destruction of a common pipistrelle bat roost located 0.3km east.

Roosting Bats

3.4.11 A number of scattered trees are located within the Site, primarily along boundary features including hedgerows and woodland habitats. A number of these have the potential to support roosting bats. No other structures or buildings on-Site were assessed as being suitable to support roosting bats.

Foraging and Commuting Bats

3.4.12 Areas of open arable and pastoral fields (which make up the majority of the Site) are considered to be sub-optimal and offer negligible suitability for foraging and commuting bat species. Other habitats within the Site were considered to most closely fit the description for land of 'moderate' interest for bats in accordance with BCT guidance, with continuous habitat connected to the wider landscape that could be used for commuting and also foraging habitats that are well connected to the wider landscape. These habitats include woodlands and linear features such as ditches, hedgerows and scattered trees.

Badger

3.4.13 Badgers are discussed separately in the Confidential Badger Appendix.

Otter

3.4.14 Biological data supplied by NBGRC returned no records of otter *Lutra lutra* within 2km of the Site.

3.4.15 No evidence of otter was recorded during the Extended Phase 1 survey. Aquatic habitats are present within the Site and wider survey area which could potentially be utilised by otters including water bodies and watercourses. Potentially suitable terrestrial habitat is also present within and adjacent to the Site such as woodland and hedgerows which otters may utilise for holt and resting up areas as part of a wider territory.

Water Vole

3.4.16 NBGRC returned only two historic records of water vole *Arvicola amphibius*, within 2km of the Site. These were recorded in 1998 and are situated 1.5km and 1.7km from the Site.

3.4.17 No evidence of water voles was recorded during the Extended Phase 1 habitat survey, however this is to be expected given the time of year that the survey was undertaken. Aquatic habitat is present within the Site such as ditches and a number of them contained water at the time of the survey, providing potentially suitable habitat.

Hazel Dormouse

3.4.18 NBGRC returned no records of hazel dormouse *Muscardinus avellanarius* and no EPS mitigation licences for dormouse were identified within 2km of the Site from the desk study.

3.4.19 The Site was assessed for its potential of support hazel dormouse based on the guidance outlined in the *Dormouse Conservation Handbook*[13]. The Site has field boundary features such as hedgerows and woodland that potentially offer hazel dormice foraging/hibernation habitat. The habitats also link to the wider area with good connectivity to further hedgerow systems and woodland habitats located adjacent to the Site. However, the poor species diversity of the hedgerows, the lack of any records for the species within 2km and the dominant habitats on the site having negligible potential reduces the likelihood of dormouse presence. As a result, the Site is assessed as offering very low potential to support hazel dormice.

Amphibians

3.4.20 Biological data supplied by NBGRC returned forty five records of great crested newts, thirty one records of common frog *Rana temporaria*, eleven records of common toad *Bufo bufo,* thirty three

[13] Bright, P.W., Morris, P. & Mitchell-Jones, T. (2006). *The Dormouse Conservation Handbook.* (2nd Edition). English Nature, Peterborough.

records of smooth newts, seven records of smooth *Lissotriton vulgaris*/palmate *Lissotriton helveticus* newts and two unidentified newt records within 2km of the Site. The closest of these are for two records of great crested newts and one record of smooth newt situated 0.5km distant.

3.4.1 The MAGIC website showed two European Protected Species mitigation licences granted for developments which affect great crested newts within 2km of the Site boundaries. The closest of which relates to licence (EPSM2012-4411) from 2013-2017 for the destruction of a resting place located 0.4km east.

3.4.2 It is considered that the dominant habitat on Site (arable farmland) offers negligible suitability for amphibian terrestrial habitat, areas of improved and semi-improved grassland potentially offer suitable foraging habitats; however, due to a lack of a dense tussock structure it is considered that this grassland habitat provides limited opportunities for refuge and is unlikely to support hibernating amphibian species. Field boundary features within the Site such as hedgerows, dense scrub and woodland provide more suitable terrestrial habitats for foraging and hibernating purposes.

3.4.3 Three ponds are present in close proximity to the Site, which amphibians could use as aquatic habitat. An additional fifteen ponds are located within 250m of the Site.

3.4.4 Four of these could be accessed and HSI and eDNA surveys were undertaken. The methodology and results are provided in **Appendix 2**; Great crested Newt Presence or Absence (eDNA) survey report.

3.4.5 Two of the surveyed ponds, P12 and P13, tested positive for great crested newts and two ponds, P14 and P15, tested negative (absent).

Reptiles

3.4.6 Data obtained from NBGRC returned no records of reptiles within 2km of the Site boundaries.

3.4.7 The Site is dominated by arable and pastoral farmland, which is considered to be of negligible value for reptile species. However, grassland field margins (albeit limited in extent) could potentially offer suitable foraging habitats and the hedgerows, associated field edges and watercourses within the Site could potentially provide suitable habitats for foraging/hibernation purposes.

Other Notable Species

3.4.8 Data provided by NBGRC returned thirty-one records of brown hare *Lepus europaeus*, eight records of Western hedgehog *Erinaceus europaeus* as well as single records of harvest mouse *Micromys minutes* and polecat *Mustela putorius* within 2km of the Site boundaries. It is considered that habitats at the boundaries of and surrounding the Site are potentially suitable for these species if present.

3.4.9 Records of roe deer *Capreolus capreolus*, stoat *Mustela erminea* and weasel *Mustela nivalis* were also returned by NGBRC but these species are common and widespread in England and are therefore discounted further within this report.

3.4.10 The data provided by NBGRC also returned records of invertebrates within 2km, one of which is listed within Section 41 (England) of the NERC Act 2006; White admiral butterfly *Limenitis camilla*. The habitats on Site, particularly the dominant arable and pastoral farmland, have limited suitability for rare or notable assemblages and are unlikely to support a wide range of invertebrate species including the white admiral butterfly.

3.4.11 Biological data supplied by NBGRC returned records of seventeen notable plant species, mainly plants listed on the Nottinghamshire rare plant register species. No evidence of these species (or suitably diverse floristic locations) were recorded during the Extended Phase 1 survey, but habitats in the local area may be suitable to support some of these species.

3.5 Invasive Non-native Species

3.5.1 Data provided by NBGRC included two records of Japanese knotweed *Reynoutria japonica*, two records of Giant hogweed *Heracleum mantegazzianum* and three records of Himalayan balsam *Impatiens glandulifera w*ithin 2km. However no invasive non-native species were observed on or surrounding the Site.

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.

4.2 Designated Sites and Habitats

Statutory Designated Sites

4.2.1 The Site does not form part of any statutory designated site for nature conservation and one statutory site was identified within 5km of the Site; Newhall Reservoir Meadow SSSI which is approximately 1.7km to the north west (as shown on **Figure 2**). No internationally designated sites were present within 10km. The Site does fall within a SSSI Impact Risk Zones but at this location, the development type does not meet the criteria which require consultation with Natural England.

4.2.2 There will be no direct or indirect effect on habitats or species within any statutory designated sites. The main reason for designation of this SSSI is related to the specific habitats present within the protected site, which are not present within or adjacent to the proposed development Site itself. The separation distance and lack of functionally linked land and with the implementation of standard good practice pollution prevention and runoff control measures during construction and operation of the solar farm, will prevent any potential for indirect impacts to occur.

4.2.3 ***Non-statutory Designated Sites***

4.2.4 Thirteen LWSs lie within 2km, including three candidate LWSs. The location of non-statutory designated sites within 2km of the Site boundaries is provided in **Figure 3.** One of these is situated within the Site, Westhorpe Dumble LWS which is designated due to it being a characteristic dumble (incised wooded stream). This LWS in the form of a small linear strip of woodland within the Site which will not be directly affected, with no tree removal proposed for the works. An access track on to the Site is proposed which will follow existing farm access tracks and disturbance in this area will be small-scale, temporary and proportionate to agricultural machinery currently using the track. A buffer will be adopted around works to ensure the development to the north and south does not encroach into this area, protecting the habitat and associated species within the LWS. With the implementation of standard good practice pollution prevention and runoff control measures during construction and operation of the solar farm, will prevent any potential for indirect effects.

4.2.5 Another three LWSs are situated adjacent to the Site; Halloughton Wood LWS to the south west, Cotmoor Lane LWS to the south west and Westhorpe Dumble Head Drain LWS to the west. All of these LWS are designated for their habitats and these will not be directly affected by the proposed development, with all works confined to within the Site boundary. A buffer of at least 15m will be adopted around the ancient woodland; Halloughton Wood.

4.2.6 In addition, standard measures to ensure runoff control and pollution prevention will be implemented to ensure neither the habitats or species associated within any LWS are indirectly affected. It is therefore anticipated there will be no direct or indirect impacts on any non-designated sites.

Habitats

4.2.7 Opportunities have been actively sought where possible for nature conservation enhancement of the Site, to provide an overall biodiversity gain; in line with *BS 42020 – A Code of Practice for Biodiversity in Planning and Development.* Landscape proposals should ensure that there is no net loss of habitats of ecological value and all habitat loss should be mitigated for appropriately. All habitat enhancement/retention measures and subsequent management to benefit biodiversity will be informed by a Biodiversity Management Plan (BMP)**.**

4.2.8 The Site comprises an extensive area; however construction of the solar farm requires very low levels of direct and permanent land take. The BRE guidance[14] states that, as panels are raised above the ground on posts, over 95% of a site used for solar farm development is still accessible for plant growth and complementary agricultural activities, such as conservation grazing. The RSPB briefing note on Solar Energy[15] also states that biodiversity gains are possible where intensively cultivated arable or grazed grassland is converted to extensive grassland and/or wildflower meadows between and/or beneath solar panels and in field margins. A benefit to wildlife can therefore be achieved through creation of floristically diverse grassland within the Site. The creation of such grassland will result in a specific benefit to birds, mammals, amphibians, reptiles and invertebrates.

4.2.9 The area for the solar panel array layout has been designed to avoid impacts to field boundary features such as hedgerows and trees, and to protect the majority of woodland habitats within and immediately surrounding the Site. These will be retained and protected following British Standards BS5837:2012 *Trees in relation to design, demolition and construction.* Further details are presented in the BMP**.**

4.2.10 Habitats which will be directly affected by construction works include arable fields and improved grassland. Such farmland habitat is ubiquitous within the local landscape and vegetative ground-cover will be largely retained beneath the panels, with effects primarily comprising of temporary compaction and soil disturbance from plant machinery and vehicles, together with the minor temporary loss of ground vegetative cover within the Site. Negative effects on these habitats will therefore be largely temporary and the ecological effect is considered to be low.

4.2.11 A very small area of young plantation woodland will be impacted to accommodate an access track to the south east of the Site. This has limited ecological and botanical value as it is young and limited in species present, with no understory yet developed.

4.2.12 A new 0.43ha woodland belt will be created to the south of the Site as part of the landscape planting design for the proposed development. This will both compensate for the small number of immature plantation trees removed to accommodate the access track and enhance local biodiversity, including native species of UK provenance. It will be managed to develop a well-structured woodland with ground flora and understory which can be utilised by a wider range of species.

4.2.13 Two areas of species poor semi-improved grassland at TN7 and TN8 at the time of the survey appeared to be created/managed as set aside grassland. These field margins are likely to be temporarily impacted during the construction phase. However, once operational this habitat type will be retained and extended across the Site, with a similar species assemblage encouraged to develop throughout the fields used for the solar array.

4.2.14 Management practices are proposed that 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 creation and

[14] https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf
[15] RSPB (2014) *Solar Energy: RSPB Policy Briefing, December 2014*. RSPB: Sandy. Available at https://www.rspb.org.uk/Images/Solar_power_briefing_tcm9-273329.pdf

maintenance of native species hedgerows, new woodland planting and replacement of arable crops with extensive grassland habitat.

4.2.15 Habitat enhancement measures which form part of the proposed development include:

- Creation of new native species-rich hedgerows and maintenance and enhancement of existing hedgerows including the supplementary infill planting, strengthening existing defunct and gappy hedgerows, totalling 1,262m;
- Creation of an 0.43ha tree belt;
- Creation of 948m of swale habitat;
- Creation of a floristically diverse grassland sward to replace low biodiversity value arable land beneath and surrounding the panels; and,
- Installation of bird and bat boxes on suitable trees around the Site and within the wider landownership area for biodiversity.

4.2.16 A second parcel of land is included within the overall redline application boundary approximately 260m from the proposed area of development at the closest point, west of the main Site. This is referred to as the "area for biodiversity " and comprises a pocket of woodland and will not be directly impacted by any construction or operational activity but will be set aside for wildlife and enhanced with the installation of bat and bird boxes.

4.2.17 Full details of construction phase mitigation and biodiversity enhancement and management measures are provided in the BMP and new planting in the *Site Layout and Planting Proposals Plan*. The creation of new floristically diverse grassland habitat throughout fields once intensively managed as arable and pastoral farmland will support net biodiversity gain, with wildlife able to utilise secure and undisturbed land under and around the solar panels.

Biodiversity Net Gain

4.2.18 In order to assess the change in biodiversity associated with the proposed development, a net gain calculation was undertaken to provide quantified evidence of the change in biodiversity with the implementation of the proposed layout and the landscape planting as proposed. This calculation considered land take, habitat loss/change and habitat creation that will accompany the proposed development, assessed using the Defra Metric Biodiversity Net Gain Calculator (version 2.0)[16] the calculation adopted precautionary assumptions in relation to build area, cropping and grassland quality, which nonetheless demonstrates that an overall net gain of over 27.83% in habitat units will accompany the proposed development, as summarised below in **Table 4.1** (the full Defra Workbook is available separately). This net gain will be achieved through the proposed landscape planting, habitat enhancements and long term management as set out in the BMP and *Site Layout and Planting Proposals Plan.*

[16] http://publications.naturalengland.org.uk/publication/5850908674228224

Table 4.1: Headline Biodiversity Net Gain Results (extract from Defra version 2.0 Beta)

On-site post-intervention (Including habitat retention, creation, enhancement & succession)	*Habitat units*	299.30
	Hedgerow units	33.27
	River units	0.00
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement &	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention/creation)	*Habitat units*	65.16
	Hedgerow units	5.65
	River units	0.00
Total net % change (including all on-site & off-site habitat creation + retained habitats)	*Habitat units*	27.83%
	Hedgerow units	20.46%
	River units	0.00%

4.3 Protected and Notable Species

Birds

4.3.1 All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended). Over eighty species or groups of species are listed under Schedule 1 of the Act, which confers special protection with increased penalties for offences committed. Additional protection is provided to species listed under Directive 2009/147/EC on the conservation of wild bird (the 'Birds Directive') codified version.

4.3.2 Potential effects on birds during construction relate to the temporary loss of breeding or foraging habitat, directly within the Site, or indirectly within adjacent areas through disturbance or displacement. The proposed layout includes buffers around hedgerows, trees and woodland areas which serve to separate potentially disturbing activities from possible nesting locations. Grassland habitats within the Site may also potentially provide suitable foraging habitat which will be temporarily affected by the construction works. However, extensive suitable foraging habitat is located in the local area and once operational, the extensive areas of relatively undisturbed grassland created under and around the solar array, will likely enhance the prey resources and foraging opportunities provided by the Site.

4.3.3 In order to 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 preparatory site clearance and associated vegetation removal takes place where possible outside of the bird breeding season (March-August inclusive). If vegetation works are necessary during the breeding season, any suitable nesting habitat to be affected by works will be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the legislation.

4.3.4 While some species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) may potentially use the Site for foraging and roosting as part of a wider territory, they are not likely to use the largely unsuitable habitats on Site for breeding.

4.3.1 Two Schedule 1 species were noted during the wintering bird survey; redwing and fieldfare utilising the Site for roosting and foraging. Target Species activity was overall very low across the Site during

the winter bird survey, with one target species recorded; woodcock as shown on Figure 7. The Site and Wider Survey Area is not considered to provide notable habitat for Target Species.

4.3.2 Furthermore, the Site is arable and pastoral land which is a dominant habitat type in the locality, and therefore any displaced small numbers of Target Species will likely use alternative comparable habitats in the surrounding area.

4.3.3 Secondary Species recorded include fieldfare, starling, reed bunting and dunnock in relatively small numbers. Secondary species recorded were typically passerines, which are widespread in farmland habitats, and are generally considered to be unaffected by solar developments with suitable habitat enhancement opportunities.

4.3.4 Birds nesting on open ground such as skylark and woodcock may be displaced; however, in the context of comparable habitats locally, the areas lost will be small and will largely comprise of arable and young plantation woodland habitats. Whilst some level of displacement may occur, the impacts of habitat loss are considered to be negligible given the low level of bird use observed and wide availability of suitable habitat in the area.

4.3.5 Furthermore, it has also been noted in the literature[17] that ground nesting bird species may potentially nest between the rows of solar panels; therefore, displacement is unlikely to be permanent.

4.3.6 If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works; including agricultural cropland habitats, 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.

4.3.7 The recently published *The Effects of solar Farms on Local Biodiversity: A Comparative Study*[18] investigated whether solar farms can lead to greater ecological diversity when compared with equivalent undeveloped sites. The study revealed that overall, both a higher diversity and abundance of birds of conservation concern utilise solar arrays when compared with control plots, thereby indicating that solar farms may be able to provide an important resource for declining farmland bird species. Within this study the difference in numbers of skylarks within solar plots and control plots was found to be not significant. This shows that skylarks will likely utilise the habitats within the proposed solar development footprint within their territorial boundaries. Recent studies conducted by the RSPB and outlined in their conservation blog[19] further support high bird usage of solar farms by farmland bird species, including skylark.

4.3.8 During operation of the solar farm, disturbance will be minimal and limited to intermittent maintenance activities, likely less disturbing than normal agricultural activities.

4.3.9 The proposed development provides positive measures for birds, through infilling defunct hedgerows and new hedgerow creation with native species, floristically enhanced grassland, tree belt planting and additional bird nesting provision through the inclusion of a minimum of eight bird boxes erected on mature and semi-mature trees within the main Sites boundary and four boxes within the area for biodiversity located to the west.

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[17] http://www.solar-trade.org.uk/wp-content/uploads/2016/04/The-effects-of-solar-farms-on-local-biodiversity-study.pdf
https://www.rspb.org.uk/Images/Solar_power_briefing_tcm9-273329.pdf

[18] http://www.solar-trade.org.uk/wp-content/uploads/2016/04/The-effects-of-solar-farms-on-local-biodiversitystudy.
http://www.solar-trade.org.uk/wp-content/uploads/2016/04/The-effects-of-solar-farms-on-local-biodiversitystudy.pdf

[19] https://community.rspb.org.uk/ourwork/b/biodiversity/posts/bird-use-on-solar-farms-final-results

4.3.10 The inclusion of bird nest boxes and landscape planting, detailed within the *Site Layout and Planting Proposals Plan* and BMP, will enhance opportunities for breeding and wintering birds. Subsequently the proposed development will retain current bird habitat features and provide additional benefits for foraging, roosting, breeding and wintering birds.

Bats

4.3.11 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 Regulations 2017 (as amended). 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.

4.3.12 Seven bat species in the UK are also listed as species of principal importance for the purpose of conserving biodiversity under Section 41 of the NERC Act 2006 and nine bat species are also listed as a priority species within the Nottinghamshire Local Biodiversity Action Plan.

Roosting Bats

4.3.13 Trees are situated within the Site within hedgerows and woodland habitat which could potentially be used by roosting bats. A small number of trees will be removed within the plantation woodland to the south east of the Site. The trees within this woodland were young in age and subsequently do not have any bat roosting potential. No other trees on the Site are scheduled for removal as part of the proposed development. All trees will be protected following the British Standards BS5837:2012 *Trees in relation to design, demolition and construction*. No structures or buildings were located on Site during the Extended Phase 1 survey that could support roosting bats.

4.3.14 If the development plans are amended and additional trees are to be impacted, further surveys may be required to determine presence/absence of roosting bats, following BCT guidelines.

4.3.15 The proposed development also provides positive measures for roosting bats, through the provision of a minimum of eight bat roost boxes on suitable trees along the hedgerows and woodland within the main Site and four within the area for biodiversity.

Foraging and Commuting Bats

4.3.16 Hedgerow, field margins and woodland located within and surrounding the Site potentially provide the highest value foraging and commuting habitat. Hedgerows within the Site will be protected and retained, ensuring no net loss or fragmentation of resources. However, a small linear strip of plantation woodland will be removed as part of the proposed works, to the south east of the Site for an access track. This is young in age and is not well established. It is thought that the removal of a small linear area of young plantation woodland will not adversely affect local bat populations with more optimal woodland present in the vicinity maintaining habitat connectivity. In addition, the creation of a tree belt will enhance the connectivity across the Site and provide bats with additional foraging habitat.

4.3.17 Improved and semi-improved grassland arable field margins may also contribute to foraging resources for bat species. These habitats will be lost as part of the proposed development but positive measures to strengthen habitat connectivity and foraging opportunities for bats, through gapping up and planting native species hedgerows and reverting arable land to more structurally and species diverse grassland is likely to attract higher number of invertebrates.

4.3.18 Temporary disturbance during the construction process will be largely confined to daylight hours and the Site will not be lit at night, hence construction is not considered likely to have any discernible effects on local commuting and foraging bat populations.

4.3.19 Any lighting required during construction and/or operation of the solar farm will be directed away from woodlands and field boundary features such as trees and hedgerows. This can be achieved in a number of ways, including the use of low level lighting and use of hoods (further information is provided in BCT guidance (2018) *Bats and Lighting in the UK: Bats and the Built Environment Series*[20]). The operational Site will not be lit at night and only very limited access-related lighting is required, also not considered likely to have any discernible effect on foraging bats.

4.3.20 Overall, the proposed development will retain and strengthen current bat habitat features (hedgerow networks and tree lines) and provide additional features for roosting, foraging and commuting bats which will ultimately benefit bat populations using the Site and in the wider environment.

Badger

4.3.21 Badgers are discussed separately in the Confidential Badger Appendix.

Otter

4.3.22 Otters are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); they receive further protection under the Conservation of Habitats and Species Regulations 2017 (as amended). 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:

    a) impair their ability to survive, breed or reproduce, rear or nurture young, and;

    b) affect significantly the local distribution or abundance of the species.

4.3.23 Otter is also listed under Section 41 of the NERC Act 2006 and listed as a priority species within the Nottinghamshire Biodiversity Action Plan[21].

4.3.24 No records of otter were returned within 2km and no holts were recorded within the Site or wider area surveyed. Three watercourses including Westhorpe dumble (TN15) are present within the Site which could provide aquatic habitat for the species. In addition woodland, hedgerows and ponds both in and adjacent to the Site may support foraging otters as well as providing otter holt/resting habitat.

4.3.25 No works are proposed that would directly affect either optimal aquatic or terrestrial habitat onsite with works concentrated on low suitability arable and pastoral land. Aquatic habitats have direct connectivity to the wider landscape and link to optimal habitats such as woodland. These pathways will not be impacted by the proposed works.

4.3.26 A small area of young plantation woodland will be removed as part of the proposed development to facilitate construction of an access track. No otter holts were seen within this woodland during the

[20] Bat Conservation Trust. (2018). *Bats and Lighting in the UK: Bats and the Built Environment Series*
[21] http://www.nottsbag.org.uk/pdfs/BAP/sap_otter.pdf

survey and the young age, undeveloped canopy and lack of understory structure makes this habitat largely unsuitable for otter. More suitable habitat is present in the wider area, which otters (if present) are more likely to utilise. Therefore, the loss of this small area of young plantation woodland will not adversely impact otters if present in the area.

4.3.27 Suitable protection buffers will be maintained around retained woodland and hedgerows which will also protect any animals potentially using these as movement routes within a wider territory. With the adoption of standard good practice pollution prevention and site runoff control measures, otters are not considered likely to be adversely affected by the proposed development.

4.3.28 It is considered highly unlikely that otters are present in the Site and combined with suitable habitats such as watercourses, woodlands and hedgerows being retained and protected during works the proposed development is not considered likely to have any effect on otters.

Water Vole

4.3.29 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 is listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and within the Nottinghamshire Biodiversity Action Plan species[22].

4.3.30 Watercourses are present within and around the Site which may potentially provide suitable habitat for water voles. However these habitats will not be directly affected by the proposed development, with the implementation of a 5m buffer from the watercourses, which will fenced for added security.

4.3.31 Construction works may involve very localised disturbance in the form of resurfacing of existing watercourse crossings. This will be temporary and will not involve any works entering the watercourse. The level of disturbance is considered to be proportionate to the agricultural practices and passing of farming machinery which is already experienced on the Site. As a result, there will be no direct impact on water voles from the proposed development.

4.3.32 A reduction in water quality of the watercourses on Site, could indirectly impact water voles if present in the area along with other wildlife. However, the implementation of standard good practice pollution prevention and site runoff control measures will ensure there is no indirect impacts on the species.

Hazel Dormouse

4.3.33 Hazel dormice are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended). The Act and Regulations make it an offence to:

- Deliberately capture, injure or kill hazel dormice;
- Damage or destroy a hazel dormouse resting place or breeding site;
- Deliberately or recklessly disturb a hazel dormouse while it's in a structure or place of shelter or protection; and/or,
- Block access to structures or places of shelter or protection.

[22] http://www.nottsbag.org.uk/pdfs/BAP/sap_watervole.pdf

4.3.34 Additionally, the hazel dormouse is listed as priority species under Section 41 of the NERC Act 2006 and Nottinghamshire Biodiversity Action Plan species[23].

4.3.35 The dominant arable and improved grassland habitats within the Site are considered to have negligible potential to support the species, however, the field boundary features, hedgerows and woodland offer suitability for foraging/hibernating hazel dormice if present. The Site is well connected through the hedgerow networks and woodland habitats in the wider environment. More suitable habitat is present in close vicinity including ancient and semi mature woodland however there is an absence of dormouse records within 2km of the Site. It is considered unlikely that the species is present within the Site which offers less suitable habitat conditions

4.3.36 Habitat loss as a result of the proposed development will mainly involve the development of land currently used as arable and improved grassland (negligible potential for dormice). Hedgerows and a suitable woodland habitat will be retained and protected during works, maintaining habitat connectivity and avoiding direct disturbance to these features and any animals associated with it.

4.3.37 A small area of young plantation woodland will be lost to the proposed development. This woodland is not well established with no understory present that dormice could utilise and is not considered suitable to support dormice.

4.3.38 In addition to the protection of existing hedgerows enhancements are proposed as part of landscape planting which will benefit hazel dormice (if present in the future). Additional planting and strengthening of the hedgerow network with appropriate native shrub and tree species strengthen habitat connectivity and increase foraging opportunities.

4.3.39 If the proposed development is altered and small sections of hedgerows are to be affected (e.g. for access), a series of Reasonable Avoidance Measures (RAMs) are likely to be sufficient to avoid the potential for inadvertent impacts on individual animals if present. The adoption of a RAMs method statement if required will ensure that the favourable conservation status of the local hazel dormice population will be maintained.

Amphibians

4.3.40 Great crested newts and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). 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 great crested newt while it is occupying a structure or place that it uses for shelter or protection. Great crested newt and common toad are listed as priority species under Section 41 (England) of the NERC Act 2006 and UK BAP.

4.3.41 Three ponds are in close proximity to the Site and an additional fifteen ponds are located within 250m (**Figure 5**). EDNA surveys of accessible ponds found P12 and P13 to be positive for great crested newts and P14 and P15 to be negative.

4.3.42 With records of great crested newts in the local area confirmed by these eDNA survey results, measures to ensure protection of individual animals and maintenance of the favourable conservation status of the species have been included as part of the proposed development.

4.3.43 The arable and pasture farmland fields which form the majority of the Site and within which the solar farm will be constructed offer negligible/very low opportunities for amphibians (foraging/ hibernation), however, semi-improved grassland field margins, hedgerow bases and adjacent

[23] http://www.nottsbag.org.uk/pdfs/ZAPA_Version26.01.11.pdf

woodlands provide potentially suitable terrestrial habitat (however the lack of a suitably tussocky structure to the grassland habitats would result in negligible hibernation potential).

4.3.44 The area for the solar panel array layout has been designed to avoid impact to the hedgerows, woodland habitats and ponds surrounding the Site, with the solar panel layout and construction area designed to maintain suitable protection buffers around trees, ponds, and hedgerows, and terrestrial habitat adjacent to ponds identified as supporting great crested newts. The small area of young plantation woodland affected by the creation of an access track to the south east of the Site offers very limited habitat suitability for similar reasons, lacking refuge features.

4.3.45 The creation of extensive areas of structurally and species diverse grassland (see *Site Layout and Planting Proposals Plan* and BMP) beneath and around the panels once the site is operational will enhance hibernation, dispersal and foraging opportunities for amphibians. In addition the creation of a tree belt, swale and log piles will also benefit the great crested newts, diversifying habitats as compared to the existing agriculturally managed land.

4.3.46 Specific mitigation will be employed to protect great crested newts and ensure the continued favourable conservation status of the local population and the avoidance of harm to individual animals potentially present in or near working areas. This will take the form of detailed Reasonable Avoidance Measures (RAMs) containing a Method Statement to avoid impacts on individual amphibians during construction (including buffers round ponds and other suitable features such as hedgerows). The RAMS would include a 'tool box talk' and watching brief by the ECoW and site operatives to minimise risk of accidental harm. Please refer to the Biodiversity Management Plan (**Appendix 2**)

4.3.47 In addition, measures to ensure the continued favourable conservation status of great crested newts during the construction and operation of the proposed development will reflect legislation and guidance applicable at the time, which may influence the most appropriate adopted approach for this species in the future. In the event that RAMs are not sufficient to safeguard GCN, certain works may require to be undertaken under a Low Impact Class Licence (LICL), or full European Protected Species Mitigation (EPSM) licence from Natural England, either of which would be supported by a detailed Method Statement. A licence can only be applied for once planning consent has been granted, however it is considered that suitable mitigation is readily achievable as part of the proposed development. Solar farms require a relatively short construction period and potentially disturbing effects are essentially confined to the construction phase, with enhanced habitat provided thereafter. Hence suitable mitigation can if required be implemented under licence to ensure the continued favourable conservation status of this species.

4.3.48 As the effects on GCN can be predicted, and given the nature of the proposed development (entailing construction phase effects only, with positive benefits throughout the operation phase), the Planning Authority can be confident that Natural England would grant such a licence applied for, and hence can discharge their responsibilities in relation to European Protected Species based on the information provided. This approach is consistent with Natural England policies regarding European Protected Species in that the ecological impacts of the Proposed Development can be confidently predicted.

Reptiles

4.3.49 Widespread reptile species namely the common lizard, slow-worm, grass snake and adder *Vipera berus* are protected against killing, injuring and sale under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). These species are also listed as priority species under Section 41 of the NERC Act 2006.

4.3.50 The dominant arable fields located within the Site offer negligible opportunities for reptile species. However, field boundary features such as hedgerows and grassland may potentially provide suitable

habitats for the species. The majority of hedgerows will be retained and protected during the construction and thereafter within the Site. Grassland habitats have limited suitability for the species and these will be impacted by the proposed work. However, botanically diverse grassland proposed beneath and surrounding the solar development will provide the species with additional suitable grassland foraging and rearing habitats.

4.3.51 No records were found within 2km of the Site and as a result reptiles are not considered likely to be present within the Site and therefore not adversely affected by the proposed development.

Other Notable Species

4.3.52 The Site and surrounding area may potentially support Western hedgehog, brown hare, polecat and harvest mouse; however, these species are not considered to be a significant constraint in terms of proposed development. All four are listed as priority species under Section 41 (England) of the NERC Act 2006 and UK BAP, in addition, harvest mice are also listed as Nottinghamshire priority species.

4.3.53 The Site has sufficient vegetative cover located along the field boundaries including hedgerows and within on-Site and adjacent woodlands for the rearing of young hares. The habitats on Site are typical of habitats in the wider environment, and therefore the loss of suitable arable farmland foraging habitat as a result of the proposed development is not considered to negatively impact local populations of brown hare. The mature hedgerows and woodland both onsite and adjacent 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 botanically diverse grassland beneath and surrounding the proposed solar development will provide the species with additional suitable grassland foraging and rearing habitats.

4.3.54 The field boundary habitats (and woodland habitats) located within the Site may also be utilised by Western hedgehog, polecat and harvest mouse as part of a wider population. Hedgerows will be retained and enhanced within the proposed solar developments final layout and the majority of woodlands will be retained and protected during the construction process. However, a small area of woodland is due to be impacted to accommodate the new access track to the south east. It is thought that this small loss of plantation woodland will not affect the conservation status of local populations and the additional creation of botanically diverse grassland and hedgerow and tree planting on site will provide additional suitable habitats for this species within the Site boundaries.

4.3.55 Security fencing located around the Site perimeter will have gaps 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.

4.3.56 The retention/enhancement of a large proportion of hedgerows and woodland in the Site will likely continue to provide a variety of invertebrate species with suitable habitats. The development of botanically diverse grassland beneath and surrounding the proposed solar development as well as hedgerow creation/infilling , swale creation and tree planting will enhance the Site's potential to support a diverse invertebrate assemblage.

4.3.57 No watercourses will be directly affected by the proposed development, and indirect impacts can be avoided through the implementation of standard good practice pollution prevention and runoff control measures, no effects are anticipated on any aquatic species or downstream habitats.

4.3.58 If small sections of hedgerows are to be affected (e.g. for access) and with the installation of an access track within plantation woodland; a series of Reasonable Avoidance Measures (RAMs) are required to avoid the potential for inadvertent impacts on individual animals such as hedgehogs if present. Outline RAMs are included in the Biodiversity Management Plan, and include a tool box talk

and supervision by a suitably qualified Ecological Clerk of Works. The adoption of a RAMs method statement will ensure that hedgehogs and the local hedgehog population will not be adversely affected.

4.3.59 Habitats to support White admiral butterflies is sub optimal within the Site and habitats which the species could potentially utilise such as woodland and field edge boundaries. Field margins will be lost as part of the proposed development, as will a very small area of woodland. However, the creation of a species diverse grassland, hedgerow planting and creation of a tree belt will provide additional habitat to that already present within the Site and therefore white admiral butterflies are not considered likely to be adversely affected by the proposed development.

4.3.60 No plant species listed by NGBRC on the Nottingham rare plants register were found during the survey. Although the timing of the survey was sub-optimal, dominant habitats within the Site including arable and improved grassland are not optimal habitats and unlikely to support the range of species listed in the rare plants register.

4.4 Invasive Non-native species

4.4.1 No species of invasive non-native species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) were recorded on Site during the Extended Phase 1 habitat survey. 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. Standard precautionary measures will be employed during the construction phase to avoid any accidental introduction or spread of invasive species.

5 SUMMARY - ECOLOGY PRIORITY MATRIX

5.1.1 An Ecological Assessment was undertaken for the proposed solar development on land at Cotmoor Solar Farm, Nottinghamshire.

5.1.2 **Table 5.1** summarises the ecological constraints and opportunities associated with the development, and makes recommendations for pre-construction survey work and / or mitigation measures as required.

Table 5.1: Ecological Constraints and Opportunities

Feature		Details
Designated sites for Nature Conservation	Constraints & Opportunities	a. The closest statutory designated site is Newhall Reservoir Meadow SSSI located 1.7km north west of the Site. approximately the Devon Park Pastures LNR located approximately 3km north of the Site. The Site has no connections to any habitats within this SSSI and subsequently no effects are considered likely to occur. b. No internationally designated sites are situated within 10km of the Site. c. The Site does not fall under any NE SSSI Impact Risk Zones. d. One LWS is located within the Site (Westhorpe Dumble LWS) and three LWS are situated adjacent including Halloughton Wood LWS, Cotmoor Lane LWS and Westhrope Dumble Head Drain LWS. e. Buffers will be enforced around LWS to ensure there are no direct impacts to the habitats and species within these protected sites. In addition, works relating to access within the LWS will be restricted to existing access tracks, therefore not impacting on the woodland dumble habitat. f. Standard measures to ensure runoff control and pollution prevention will also be implemented and proposed works surrounding these sites will adhere to British Standards BS5837:2012 *Trees in relation to design, demolition and construction*. These measures will safeguard watercourses and woodland habitats and the species they support. No indirect effects are therefore anticipated on non-statutory designated sites.
Habitats & Flora	Constraints & Opportunities	g. The main habitat within the development footprint comprises of arable and pastoral farmland which is generally of low value to wildlife, supporting little species diversity. Field boundary features include hedgerows; trees and pockets woodland which are considered to offer suitable habitats for protected and notable species. h. Habitat enhancement measures are proposed as part of the development and will serve to enhance the development for local biodiversity. Enhancement measures include floristically enhanced and management grassland beneath and surrounding the solar array, creation of a tree belt, bat & bird boxes, swale and refuge feature creation and hedgerow planting. i. Landscape proposals ensure that there is no net loss of habitats of ecological value and include the retention and protection of large areas of woodland, hedgerows, waterbodies and watercourses. j. A small area of plantation woodland will be impacted by the proposed development but this is young in age and not well established with no understory present, it therefore has limited ecological value. The creation of a native species diverse tree belt will benefit the Site and contribute towards the biodiversity net gain of the Site. k. Habitat enhancement/retention measures will be informed by a Biodiversity Management Plan (Appendix 4). l. Landscape plans indicate that nature conservation enhancement of the site will be achieved, resulting in an overall biodiversity gain; in line with BS 42020 – *A Code of Practice for Biodiversity in Planning and Development*.

Feature		Details
	Legislative Compliance – HeRegs*	m. The Local Planning Authority may require a hedgerow survey to be undertaken to inform a planning application, if extensive hedgerow sections require removal.
	Protection Measures	n. All retained trees within the vicinity of construction areas will be protected during construction works in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*. o. Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard retained habitats, surrounding woodland habitats, adjacent aquatic habitat and habitats within the wider environment.
Birds	Constraints & Opportunities	p. The habitats on Site (field boundary hedgerows, woodland and arable land) provide suitable nesting habitat and support breeding birds typical of rural areas in the region, potentially including some of national conservation concern. q. No species listed within Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded breeding on Site, although fieldfare and redwing were noted during the wintering bird survey. r. Provision of nest boxes to provide a local benefit for breeding birds. s. Habitat enhancement measures include floristically enhanced and managed grassland beneath and surrounding the solar array, tree belt creation and infill hedgerow planting will potentially provide birds with valuable additional nesting/foraging habitat.
	Legislative Compliance – WCA**	t. If vegetation works are necessary during the breeding season, any suitable nesting habitat to be affected by works; including arable, pasture and surrounding habitats, 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. u. If a nesting species is identified, suitable work exclusion zone will be established around nest site where required, in line with best practice guidance and in consultation with the advising ecologist.
Bats	Constraints & Opportunities	v. Trees are situated within the Site which are have potential to support roosting bats. Landscape proposals ensure that field boundary features potentially used by commuting, foraging and potentially roosting bat species; such as hedgerows, woodland, and scattered trees will largely be retained within the final development layout. w. A small number of trees will be removed within the plantation woodland to the south east of the Site, but these are considered to have negligible potential for roosting bats. Also the small linear loss of woodland will not impact commuting/foraging routes for the species with more optimal habitats present in close proximity. x. The inclusion of bat boxes in hedgerows/woodland, creation of speices diverse grassland, hedgerow planting and tree belt creation will all benefit bat species.
	Legislative Compliance – WCA**, HR***	y. Trees will be protected following British Standards BS5837:2012 *Trees in relation to design, demolition and construction.* All existing hedgerow and scattered trees will be retained and protected during construction. z. If the development plans are amended and trees located within the Site, outside of the young plantation woodland, are to be impacted, further surveys may be required to determine presence/absence of roosting bats, following BCT guidelines. aa. In the event that roosting bats are identified, a European Protected Species Mitigation (EPSM) licence Natural England will likely be required in order for works to proceed.
Badger	Constraints & Opportunities	bb. See Confidential Badger Appendix cc.
	Legislative Compliance –	dd. It is recommended that a pre-construction badger survey should be completed by a suitable qualified ecologist immediately prior to the commencement of

Feature		Details
	PBA****	development/site clearance works to determine the current locations and status of the setts in and surrounding the Site ee. If an active badger sett is recorded during this pre-commencement survey and works are proposed within 30 metres of the sett then, it is recommended that works do not commence until a mitigation strategy has been produced and if necessary, a licence from Natural England obtained.
Otter	Constraints & Opportunities	ff. No otter holts or other field signs were recorded on or immediately surrounding the Site. However, aquatic habitat is present within the Site as is woodland and hedgerows which may be used for above and below ground otter holts/resting places. gg. Optimal habitats will be protected and enhanced as part of the works, maintaining connectivity around the Site. Combined with the lack of records in the area, it is considered highly unlikely that otters are present in the area and the proposed development will not adversely affect the species.
	Legislative Compliance – WCA**, HR***	hh. If an otter is seen, then all works must stop and an ecologist contacted for advice.
Water Vole	Constraints & Opportunities	ii. Watercourses are present within the Site which may potentially support this species. Works will maintain at least a 5m buffer from all watercourses. jj. Works to crossings may involve resurfacing which will be temporary in nature and not involve entering the watercourse. The level of disturbance is considered to be proportionate to that of existing agricultural practices. There will be no direct impacts on water voles from the proposed development. kk. Standard pollution prevention measures should be employed to ensure runoff control and pollution prevention will be implemented in order to protect aquatic/marginal habitats potentially used by water vole.
	Legislative Compliance – WCA**	ll. If the development is amended and will likely impact the riverside habitat within a 5m buffer zone, a pre-construction water vole survey may be required prior to development works commencing. If water vole are found to be present then measures to ensure no harm or damage ensue should be implemented in accordance with the Wildlife and Countryside Act 1981 (as amended).
Hazel Dormouse	Constraints & Opportunities	mm. The dominant arable habitat within the Site is considered to have negligible potential to support the species, however, the boundary features (woodland/hedgerows and associated habitats) offer hazel dormice potentially suitable foraging/hibernation habitat. nn. Habitat loss as a result of the proposed development will likely mainly involve the development of land currently used as arable and pasture land, the proposals for the Site include the retention of boundary features (hedgerows/semi-mature woodland) and associated habitats; therefore, the habitats suitable for the species will largely be retained and effects on these features will be negligible. oo. Combined with the lack of records in the area, it is considered highly unlikely that hazel dormice are present in the area and the proposed development will not adversely affect the species.
	Legislative Compliance – WCA**, HR***	pp. It is considered that the implementation of a series of RAMs for hedgerow removal will likely be sufficient to avoid significant impacts on the local hazel dormouse populations and individual dormice potentially present. Therefore, the favourable conservation status of the local dormouse populations (if present) will be maintained.
Amphibians	Constraints & Opportunities	qq. Aquatic and terrestrial habitat was found within 250m of the Site boundaries including ponds, woodland and hedgerows. rr. The area for the solar panel layout has largely been designed to avoid impacting habitats with potential to be used by amphibians such as field boundary features.

Feature		Details
		ss. Habitat enhancements include the sowing and management of floristically enhanced grassland within the Site, infilling of existing hedgerows and creation of a tree belt are considered to provide amphibians with additional foraging resources within a secure and relatively undisturbed environment.
	Legislative Compliance - WCA*, HR**	tt. Great crested newts have been found to be present in two ponds, P12 and P13. uu. Therefore, it is recommended that works do not commence until a mitigation strategy has been produced. This may involve undertaking works under a RAMS, or if this is not sufficient, undertaken under a LICL or EPSM licence.
Reptiles	Constraints & Opportunities	vv. The dominant arable habitat within the Site is considered to have negligible potential to support the species, however, the boundary features (woodland/hedgerows and associated habitats) offer reptiles potentially suitable habitat. ww. Habitat loss as a result of the proposed development will likely mainly involve the development of land currently used as arable and pasture land, the proposals for the Site include the retention of boundary features (hedgerows/semi-mature woodland) and associated habitats; therefore, the habitats suitable for the species will largely be retained. xx. Combined with the lack of records in the area, it is considered highly unlikely that reptiles are present in the area and the proposed development will not adversely affect the species
	Legislative Compliance - WCA*, HR**	yy. N/A
Other Species	Constraints & Opportunities	zz. The retention of hedgerows and woodland habitats on site will allow brown hare, Western hedgehog and harvest mouse (if present) to continue to utilise habitats within the Site. aaa. Security fencing located around the Site perimeter will have sufficient gaps positioned at several locations along the base of fences in order to allow mammal species such as brown hare to use the habitats on Site during the operational period. bbb. The retention of, hedgerows and woodland on Site will likely continue to provide a variety of invertebrate species with suitable habitats and the development of floristically enhanced grassland beneath and surrounding the proposed solar development as well as hedgerow and tree planting ccc. will enhance the sites potential to support a diverse invertebrate assemblage.
	Legislative Compliance - WCA*	ddd. It is considered that the implementation of habitat protection measures will also serve to safeguard and retain habitat and avoid significant impacts on the local hedgehog population and individual hedgehogs, hares or other species potentially present.
Invasive Species	Legislative Compliance - WCA*,	eee. It is recommended that if any invasive species be encountered on Site or immediately surrounding the Site prior to or during construction, the advice of a suitably qualified specialist should be sought and the appropriate control and avoidance measures adopted.

Legislative Compliance Key

* The Hedgerows Regulations 1997

**Wildlife & Countryside Act 1981 (as amended)

***The Conservation of Habitats and Species Regulations 2017, (the 'Habitat Regulations')

****Protection of Badgers Act 1992

FIGURES

Figure 1: Site Location Plan

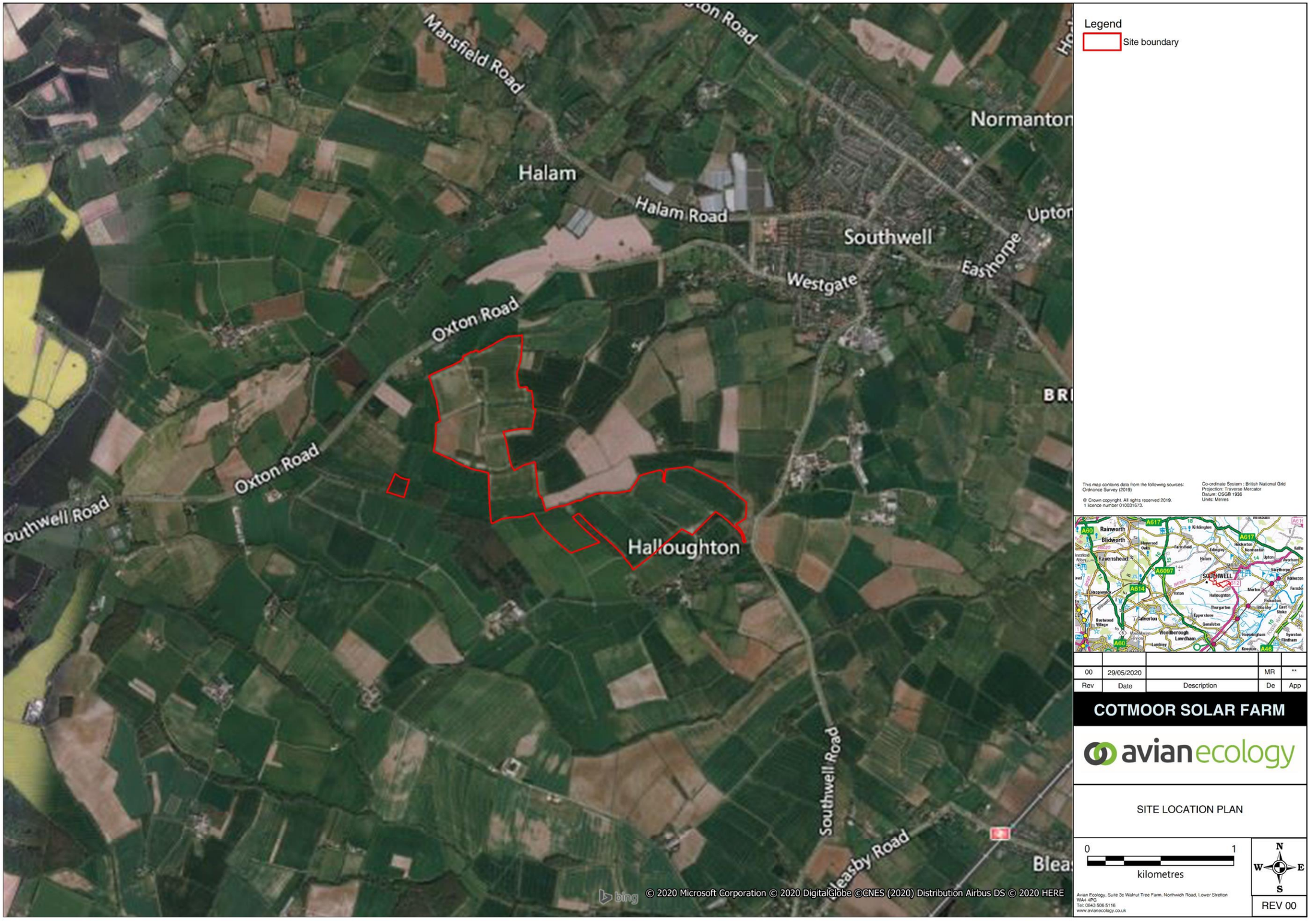


Figure 2: Statutory Designated Sites Plan

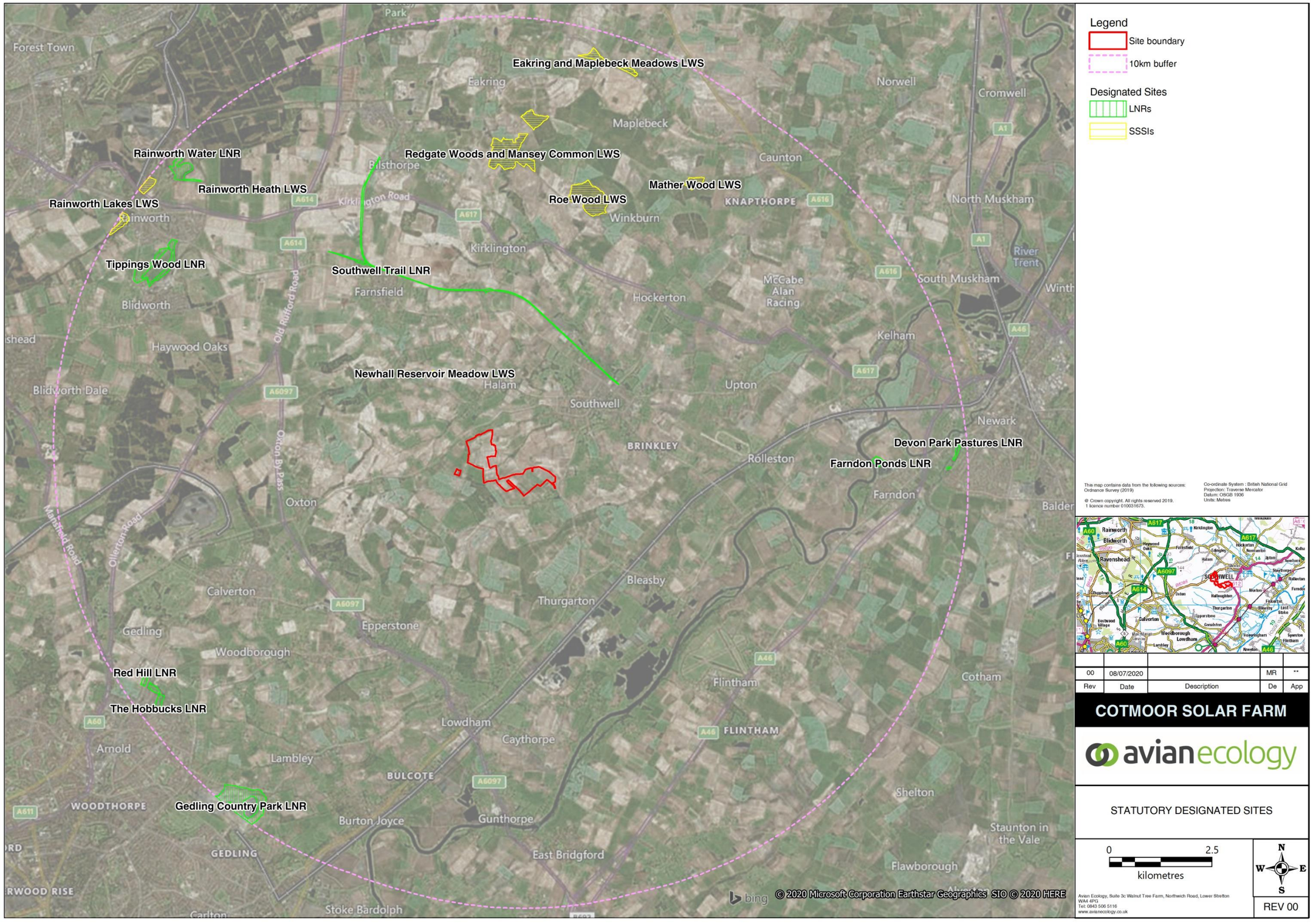


Figure 3: Non-statutory Designated Sites Plan

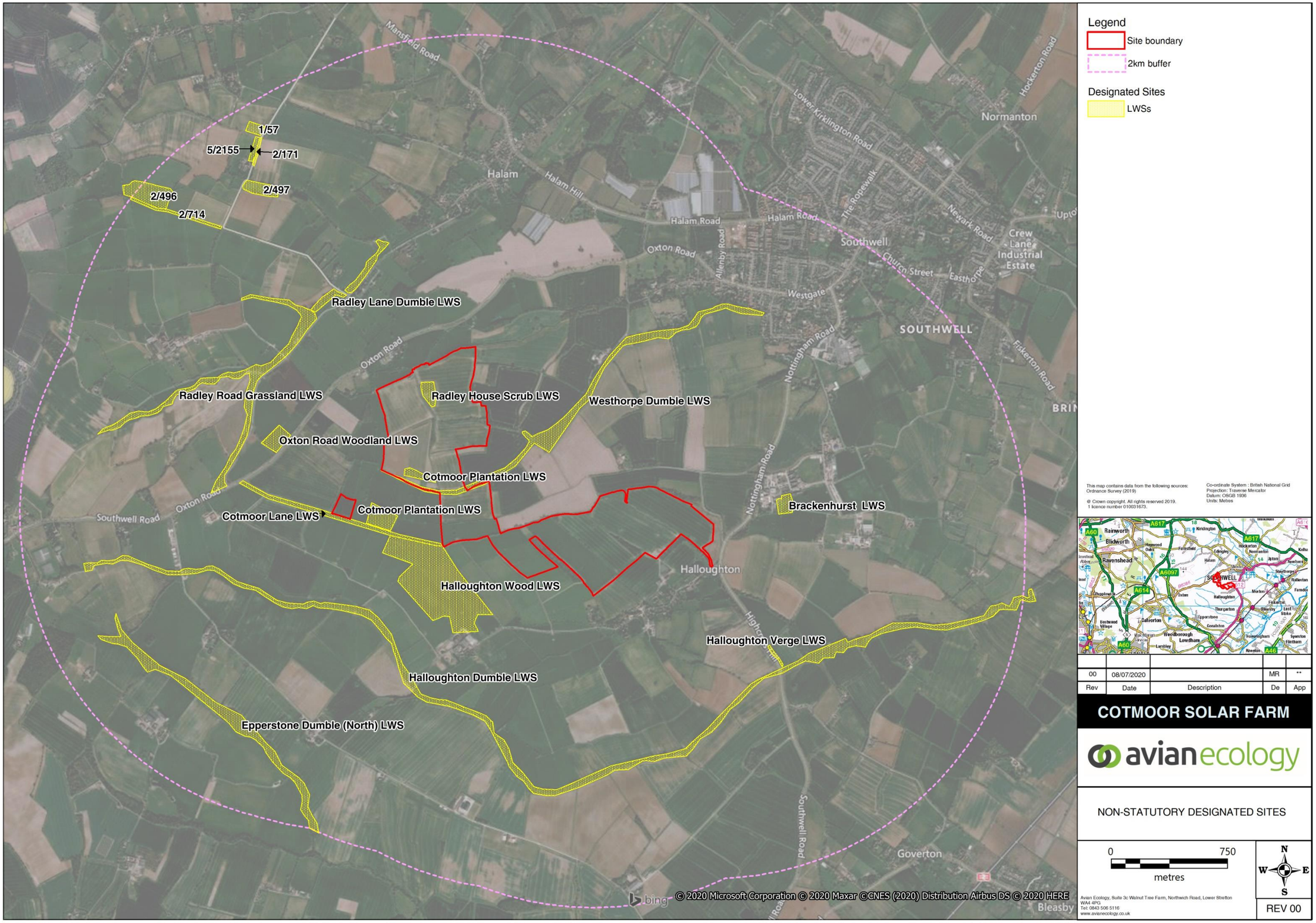


Figure 4: Phase 1 Habitat Plan

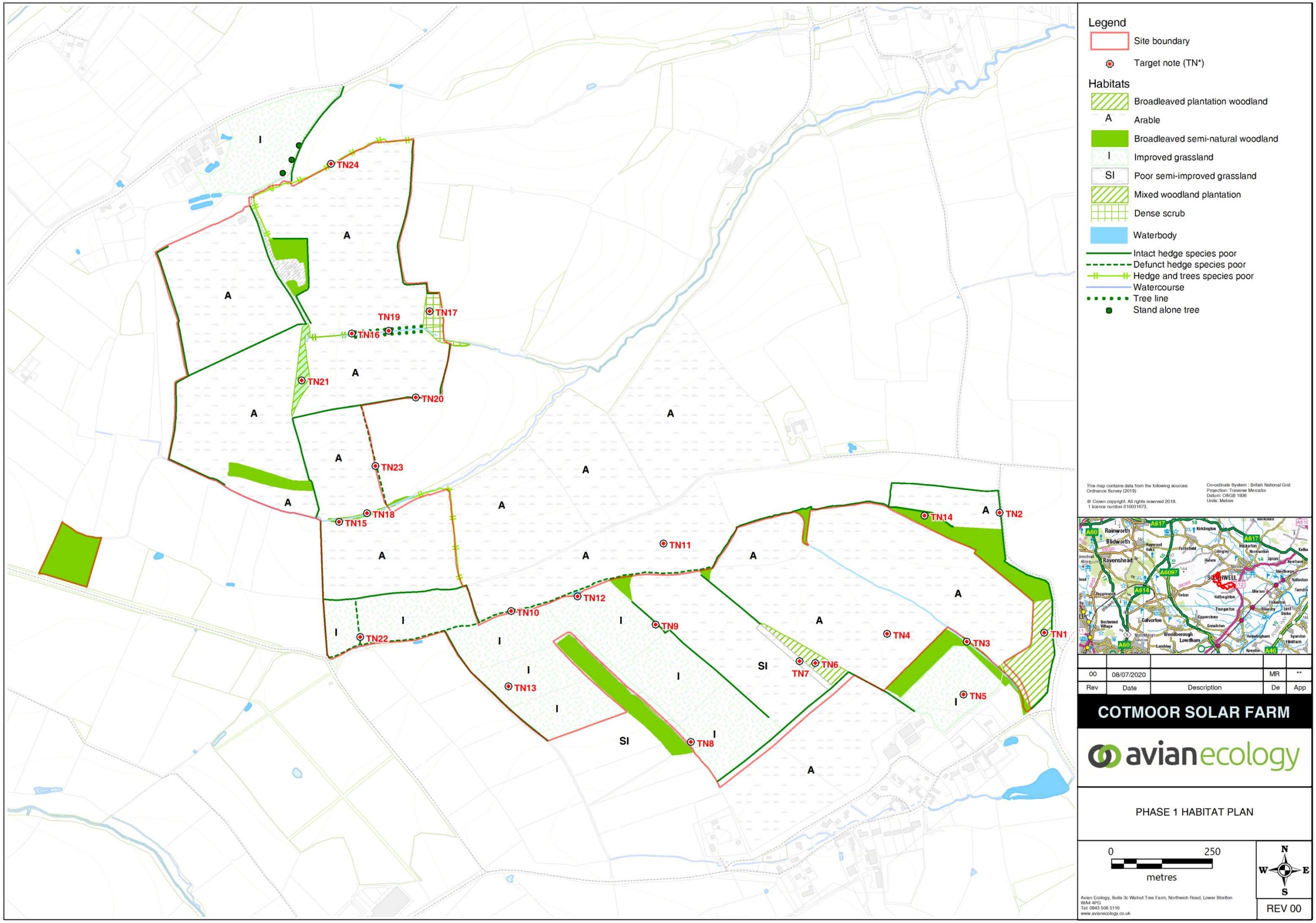


Figure 5: Pond Location Plan

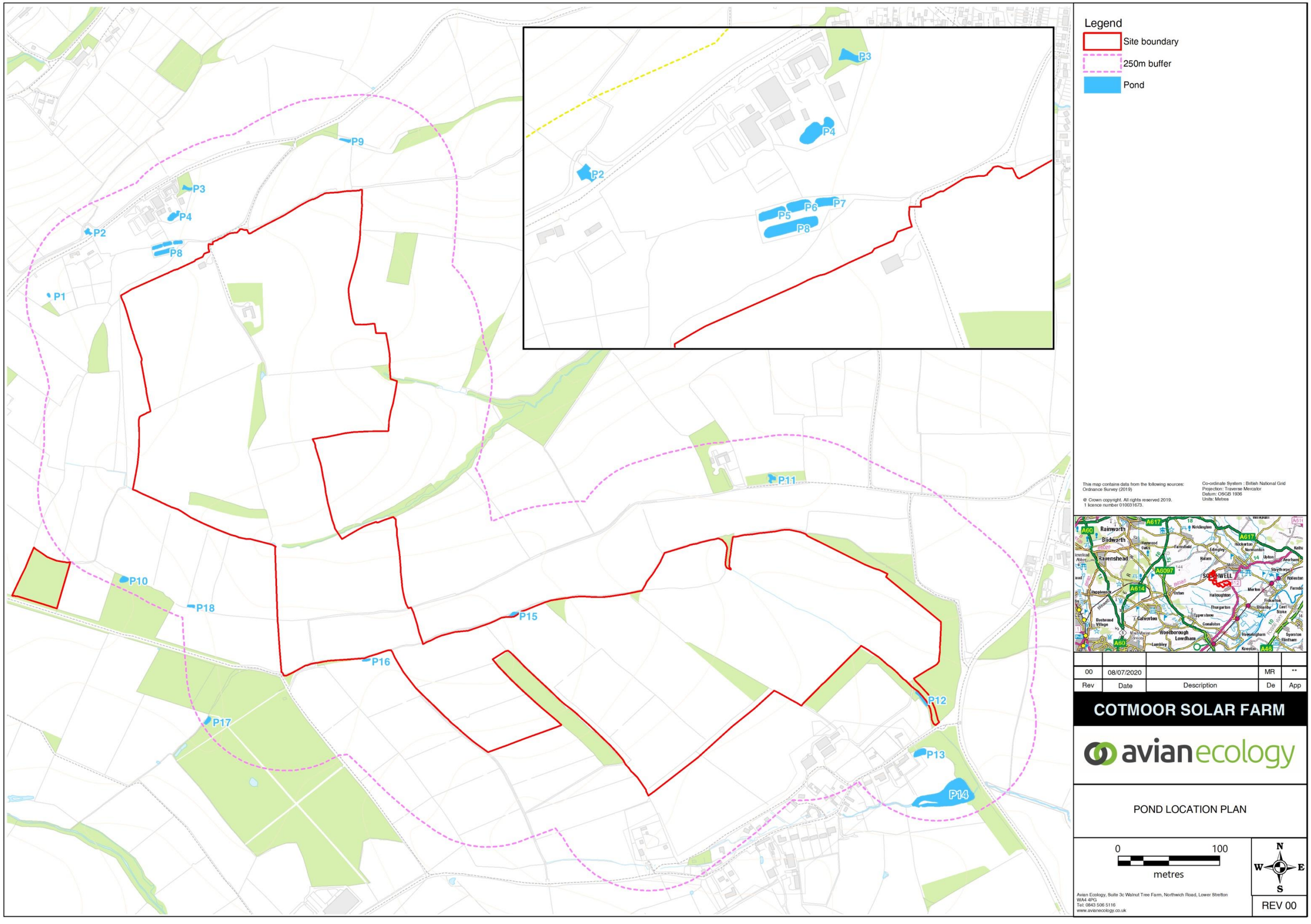


Figure 6: Winter Bird Survey Area

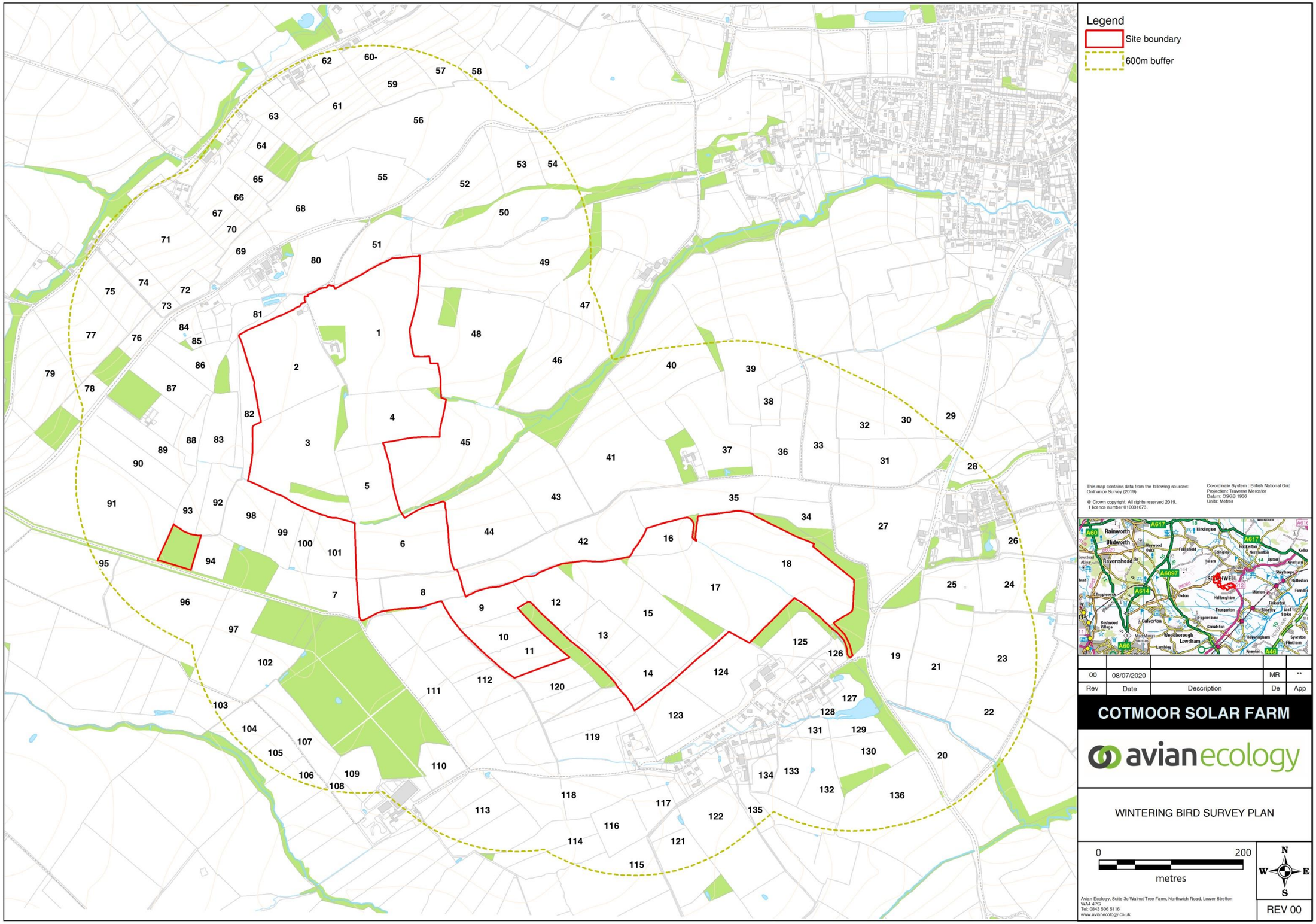
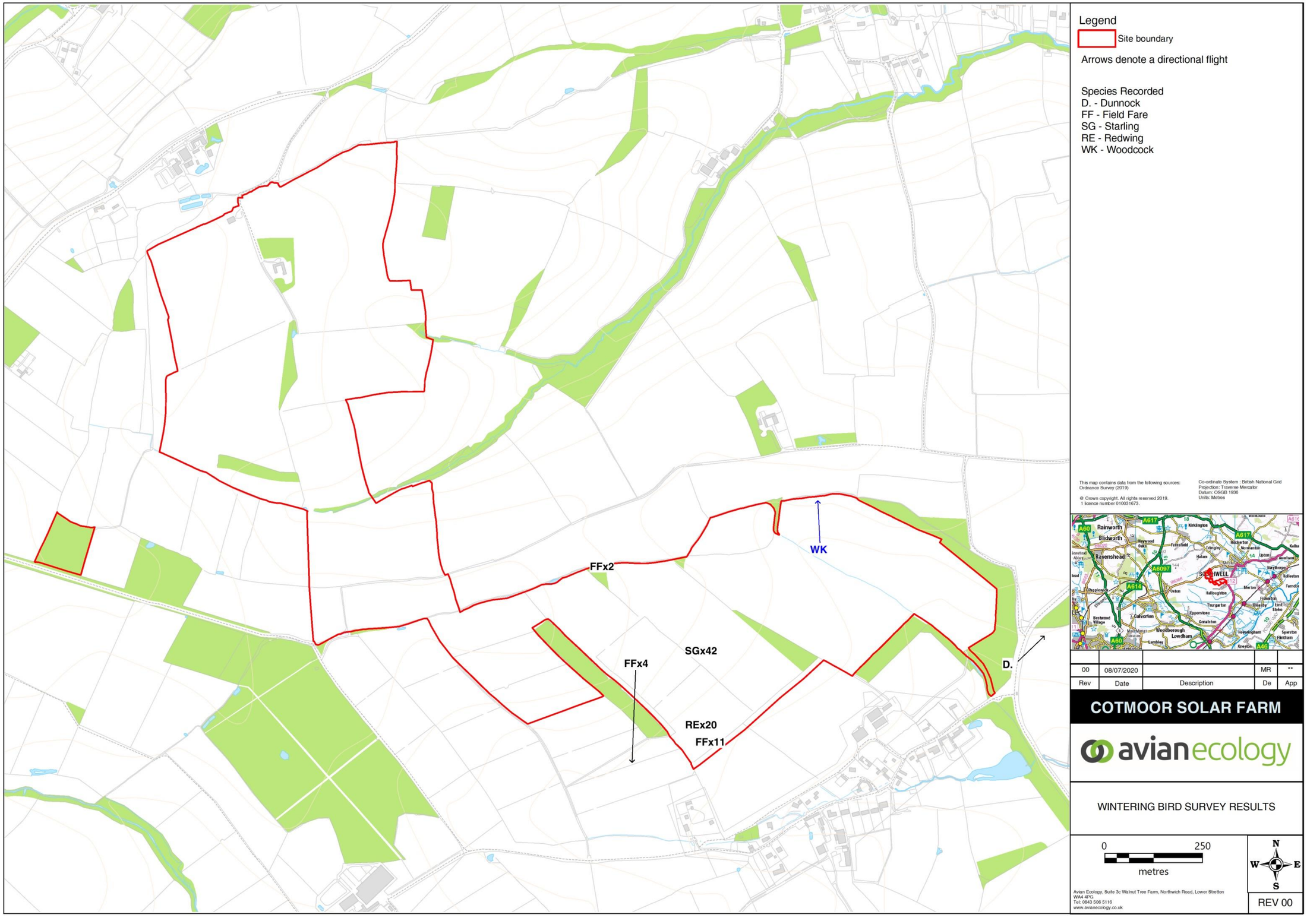


Figure 7: Winter Bird Survey Results



APPENDIX 1

Photographs

Target Note Photographs	Description
	**TN1 pic 1:** Young broad leaved plantation woodland including oak *Quercus robur*, ash *Fraxinus excelsior*, birch *Betula sp.*
	**TN2 pic 2:** Species poor intact hedge row.
	**TN3 pic 1:** Shallow ditch with steep banks those are open and clear of vegetation.

	**TN1 pic 3:** Large narrow, deep pond in which the ditch runs in and out of the pond at both ends.
	**TN4:** Arable field that has been tilled. Recently tilled with bare soil and remnants of dead crops throughout.
	**TN6 pic 1:** Mature mixed coniferous plantation woodland with including ash and birch.

	**TN6 pic 2:** Understorey comprises of dense bramble scrub and log piles.
	**TN6 pic 3:** Large log pile within woodland.
	**TN7:** Set aside area with cover for game birds and winter seed for wintering passerines.

	**TN9:** Large, mature hedgerow, comprising of predominantly hawthorn with elder and mature oak trees.
	**TN10:** Defunct hedgerow comprising of predominantly hawthorn and elder.
	**TN11:** Common reed *Phragmites australis* which appears to be being grown as a crop (outside Site).

	**TN12:** Small pond containing standing water.
	**TN13:** Improved grassland, un-stocked pastures and horse paddocks.
	**TN15:** Flowing ditch

	**TN16:** Flowing ditch
	**TN17:** Newly planted willow scrub
	**TN18:** Deciduous woodland

	**TN19:** Deciduous woodland bordering flowing ditch
	**TN21:** Mixed plantation woodland
	**TN22:** Boundary trees

APPENDIX 2

GCN Presence or Absence (e-DNA) Survey Report

(Provided as a separate document)

APPENDIX 3

Wintering Bird Survey Effort

ANNEX 1: WINTERING BIRD SURVEY EFFORT

Wintering Bird Surveys - Survey Effort

	Weather Conditions										
	Date	Surveyor	Start Time	End time	°C	Wind Speed	Wind Direction	Rain	Visibility	Cloud Cover	Cloud
Survey 1	09/01/2020	ZH/AM	10:00	15:15	11	2/3	South west	0	2	2	

*No surveys were completed in March due to the outbreak of COVID-19

Weather Conditions Key

Wind Speed		**W-Direction**	**Rain**		**Cloud Cover**		**Cloud Height**
Calm	0	Use 16 point Compass	None	0	In eighths e.g.	3/8	<150m
Light air	1		Drizzle/Mist	1			150-500
Light breeze	2	N	Light showers	2			>500m
Mod. breeze	4	NE	Heavy rain	4			
Fresh breeze	5	ENE					
Strong breeze	6	E					
Mod. gale	7	Etc	**Visibility**		**Snow**		**Frost**
Fresh gale	8		Poor	0	None	0	None
Strong gale	9		< 1km	1	On site	1	Ground
Whole gale	10		>1km	2	High ground	2	All day
Storm	11						

APPENDIX 4

Biodiversity Management Plan

(Provided as a separate document)