

## **APPENDIX 7.1**

### **COPY OF NATURAL ENGLAND'S INFORMAL PRE-APP RESPONSE**

Date: 14 September 2018  
Our ref: DAS/12986  
Your ref: N/A



Customer Services  
Hornbeam House  
Crewe Business Park  
Electra Way  
Crewe  
Cheshire  
CW1 6GJ

0300 060 3900

**BY EMAIL ONLY**

Dear Peter Timms

**Discretionary Advice Service (Charged Advice)**

DAS/12986

**Development proposal and location:** Little Crow Solar Array, Scunthorpe, DN15 0DE

Thank you for your consultation on the above dated 16 August 2018, which was received on the same date.

This advice is being provided as part of Natural England's Discretionary Advice Service. Clarkson and Woods on behalf of INRG Solar Ltd has asked Natural England to provide advice upon:

- Green infrastructure and/or priority habitat delivery
- The scope of the biological survey methodologies
- The scope of the ecological mitigation plan, biodiversity enhancement plan and construction management plan

This advice is provided in accordance with the Quotation and Agreement dated 29 August 2018.

The following advice is based upon the information within the documents:

1. Baseline Conditions Report: Extended Phase 1, Arable plants, great crested newts and water vole. Clarkson & Woods Ecological Consultants July 2018.
2. Interim Bat Survey Report. Clarkson & Woods Ecological Consultants August 2018.
3. Breeding Bird Surveys. Clarkson & Woods Ecological Consultants version 2 July 2018.
4. Wintering Bird Survey. Clarkson & Woods Ecological Consultants June 2018.
5. Draft Environmental Statement Chapter 7 Ecology and Nature Conservation. July 2018.

**Protected sites**

Natural England is satisfied that, on the basis of the information provided, it can be excluded that the proposed plan or project will have a significant effect on the Humber Estuary SAC/ SPA/ Ramsar, either individually or in combination with other plans or projects.

Furthermore, Natural England is satisfied that the proposed operations are not likely to damage any of the interest features of the Humber Estuary SSSI, Broughton Alder Wood SSSI or Broughton Far Wood SSSI.

Natural England is satisfied that the ecological survey methodologies and survey effort are appropriate to support the conclusions of the draft Environmental Statement. Natural England concurs with the conclusions of the draft Environmental Statement and welcomes the measures outlined to minimise the impact of the installation of the solar farm on the neighbouring woodland (to

be included in a Construction Environmental Management Plan).

### **Ancient woodland**

Natural England is satisfied that, on the basis of the information provided, that adequate measures will be put in place to protect the neighbouring ancient woodland, i.e. buffer zones and woodland planting. Therefore Natural England does not consider that the proposal will have a negative impact on the ancient woodland. Please see [link](#) to our standing advice on ancient woodland.

### **Protected species**

This proposal, as presented, has the potential to affect species protected under European or UK legislation, in particular, badger. Natural England has produced [Standing Advice](#) which is available on its website. Whilst this advice is primarily designed to assist local planning authorities better understand the information required when assessing the impact of developments upon protected species, it also contains a wealth of information to help applicants ensure that their applications comply with good practice guidelines and contribute to sustainable development. In particular I would draw your attention to the flow chart which gives guidance on the species that are likely to be present on the application site based upon readily identifiable habitat features. Please refer to this Standing Advice for further information on what information the authority may require in terms of survey and mitigation proposals.

Further information can also be obtained from [The Institute of Ecology and Environmental Management](#), [The Bat Conservation Trust](#) and [Biodiversity Planning Toolkit](#) for more guidance.

### **Biodiversity / priority habitat enhancements**

Natural England welcomes all of the proposed biodiversity enhancement measures that have been outlined in the Environmental Statement and considers that they are appropriate to the impact of the proposal. In particular, the inclusion of open grazed areas for breeding and wintering birds, increased amount of hedgerows and swale creation will maintain and potentially improve biodiversity on site. In addition, the use of acid grassland seed mixes would be further enhanced by the inclusion of floristic components to provide pollen and nectar. Furthermore, it might be worth exploring the potential to leave sandier areas to regenerate naturally as this can lead to an increase in species diversity. We also welcome the production of a Landscape and Ecological Management Plan (LEMP) as this will provide confidence that the enhancement measures outlined will continue to be managed post construction.

Natural England would like to highlight that a 3ha area of the proposal site is currently under Higher Tier Countryside Stewardship for the maintenance of target feature grassland and buffer strips. Natural England would like to explore the possibility of retaining this area of land under the current management agreement as it contains indicators of lowland acid grassland species, including broomrape, which is quite unusual in this area.



Figure 1. Location of current Higher Tier Countryside Stewardship Agreement

**Local wildlife sites**

As you are aware there are a number of local wildlife sites within the vicinity of the proposal site. Natural England does not hold locally specific information on local sites and recommends further information may be available from Greater Lincolnshire Nature Partnership or the Local Records Centre.

For clarification of any points in this letter, please contact Hannah Gooch at [Hannah.Gooch@naturalengland.org.uk](mailto:Hannah.Gooch@naturalengland.org.uk) or on 02082 258503.

This letter concludes Natural England's Advice within the Quotation and Agreement dated 29 August 2018.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

Hannah Gooch  
Yorkshire and Northern Lincolnshire Area Team  
Natural England

Cc [commercialservices@naturalengland.org.uk](mailto:commercialservices@naturalengland.org.uk)

## **Annex 1**

### **European Protected Species**

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's ['How to get a licence'](#) publication.

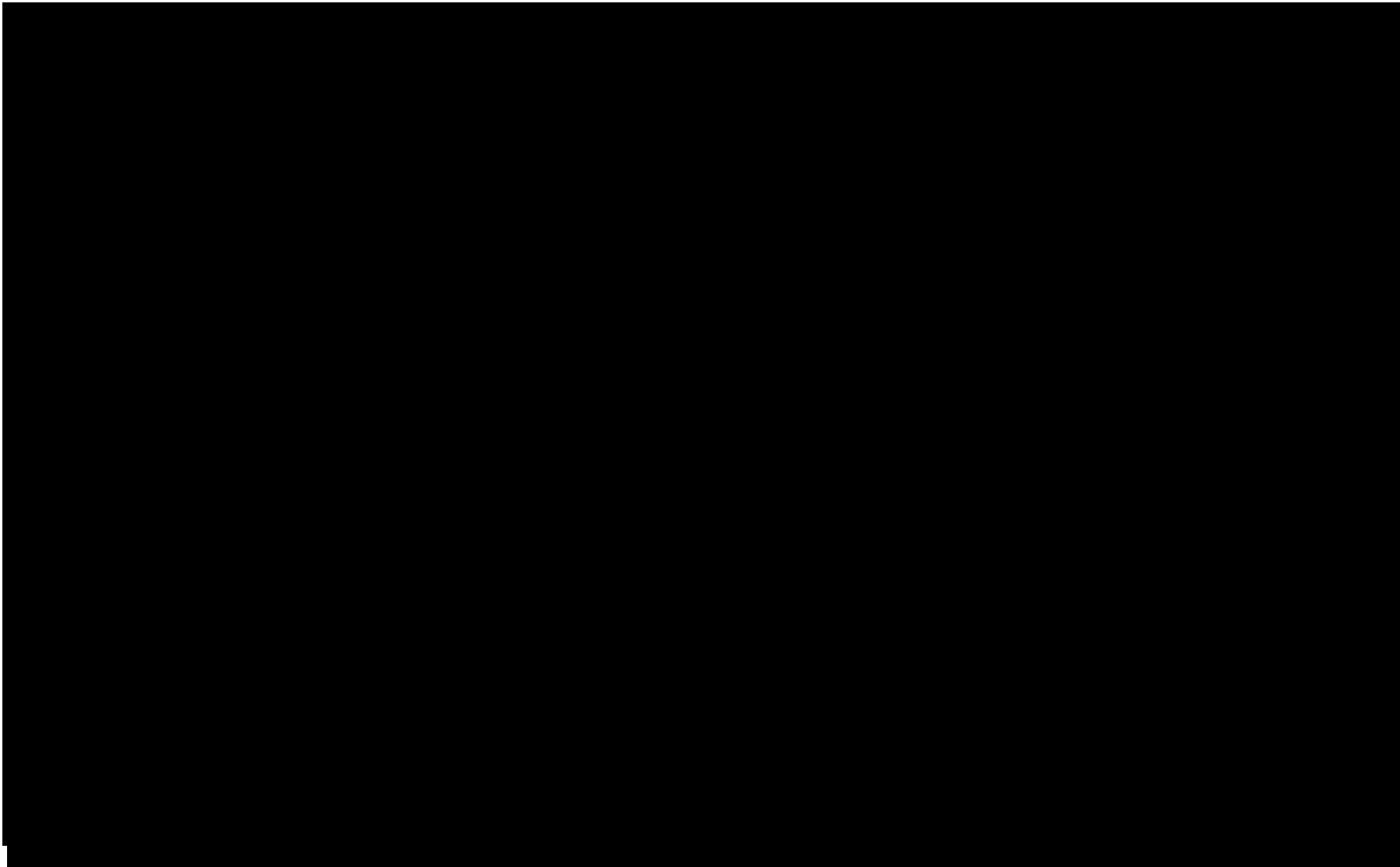
If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's [guidance](#) on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on [Natural England's website](#).

## **APPENDIX 7.2**

### **PHASE 1 HABITAT MAP AND TARGET NOTES**

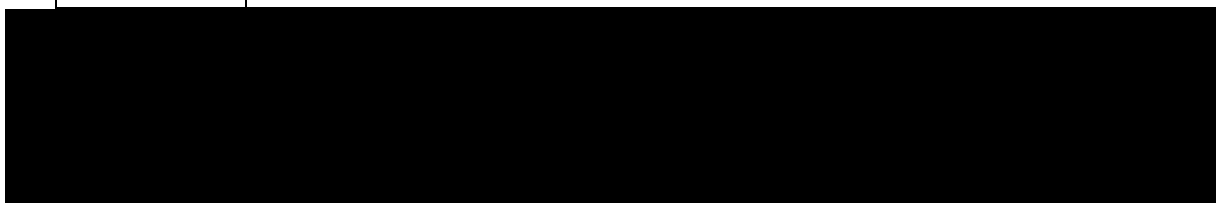


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**ECOLOGY AND NATURE CONSERVATION**

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**Table 7.5: Figure 1 Target Notes**

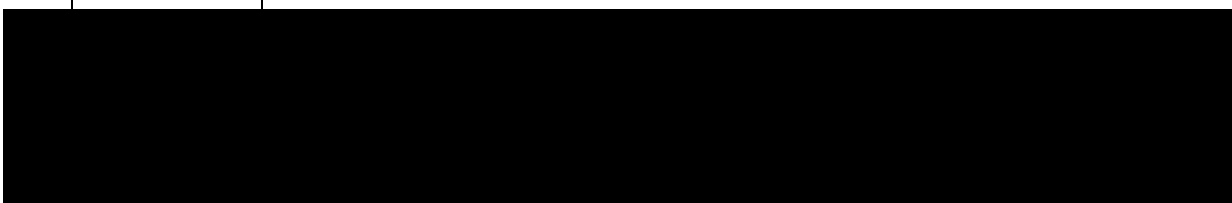
No.	Description
TN1	Shallow valley area sloping down to a small stream. Covered with tall ruderal species with scattered young willow, hawthorn and bramble scrub
TN2	Mature oak tree with small number of Potential Roost Features (PRFs) such as loose, peeling bark, vertical frost cracks, rot holes and woodpecker holes. Considered to hold Moderate Potential for roosting bats
TN3	Dilapidated brick structure within dense hawthorn scrub
TN4	Mosaic of scrub, tall ruderals and poor SI grassland with farm track running through the middle. Occasional semi-mature ash tree scattered amongst scrub.
TN5	Mature oak tree with no obvious PRFs seen from the ground, but is of an age and size that PRFs may be present further up. Considered to hold Low Potential for roosting bats
TN6	Brown hares seen frequently



TN9	Brick structure in disrepair within scrub area.
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TN11	Raised circular mound approximately 2m tall. Vegetated by coarse grasses and ruderal/herbaceous species, including false oat grass, cock's foot, hogweed, autumn hawkbit <i>Leontodon autumnalis</i> , creeping thistle and ragwort
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TN13	Raised bund reaching approximately 15m tall in far south west corner of the site. Vegetated with a mix of dense bramble scrub, coarse grasses and ruderal species.
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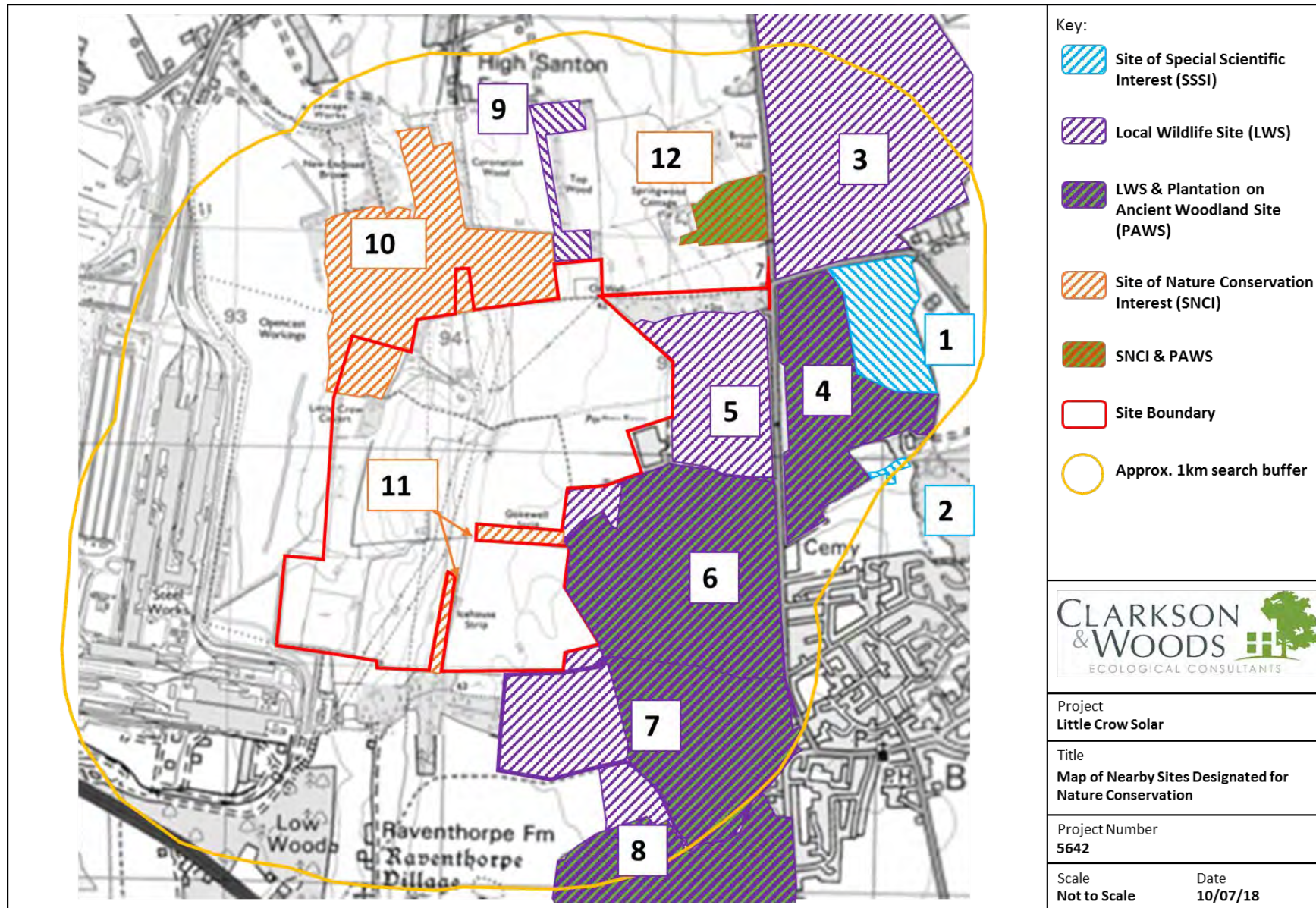
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TN15	Area in north edge of Field F11 around the edge of circular mound (TN11) containing frequent northern marsh orchid, and occasional bee orchid.
TN16	Poultry Farm
TN17	Fenced area of bare ground at a former oil well, used for storing hay bales at the time of survey, Several self-seeded sycamore, ash and blackthorn trees scattered around the edges

## **APPENDIX 7.3**

### **DESIGNATED SITES FOR NATURE CONSERVATION WITH 1KM**



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**Table 7.6: Designated Sites Shown in Figure 2**

<b>No.</b>	<b>Site</b>
1	Broughton Far Wood SSSI
2	Broughton Alder Wood SSSI
3	Rowland Plantation LWS
4	Broughton Far Wood LWS (containing PAWS)
5	Heron Holt LWS
6	Broughton West Wood LWS (containing PAWS)
7	Manby Wood LWS (containing PAWS)
8	Gadbury and Lundimore Woods (containing PAWS)
9	Santon Wood East LWS
10	Santon Wood SNCI
11	Broughton West Wood SNCI
12	Spring Wood, Broughton SNCI (containing PAWS)

## **APPENDIX 7.4**

### **EXTENDED PHASE 1, ARABLE PLANTS, GREAT CRESTED NEWTS & WATER VOLE SURVEY REPORT (CLARKSON & WOODS ECOLOGICAL CONSULTANTS, NOVEMBER 2018)**



# Little Crow

*Solar Park*

National significant infrastructure project in the Energy Sector

*Little Crow Solar Park, Scunthorpe*

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**BASELINE CONDITIONS REPORT:**  
**EXTENDED PHASE 1, ARABLE PLANTS,  
GREAT CRESTED NEWTS & WATER VOLE**

BASELINE CONDITIONS REPORT:  
EXTENDED PHASE 1, ARABLE PLANTS, GREAT CRESTED NEWTS &  
WATER VOLE

LITTLE CROW SOLAR, SANTON, LINCOLNSHIRE

carried out by



commissioned by

INRG SOLAR (LITTLE CROW) LTD

NOVEMBER 2018



# BASELINE CONDITIONS REPORT:

## EXTENDED PHASE 1, ARABLE PLANTS, GREAT CRESTED NEWTS & WATER VOLE

### LITTLE CROW SOLAR, SANTON, LINCOLNSHIRE

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Project title	Little Crow Solar, Santon, Lincolnshire			
Project number	5642			
Document title	Baseline Conditions Report: Extended Phase 1, Arable Plants, Great Crested Newts & Water Vole			
Client	INRG Solar (Little Crow) Ltd			
Author	Peter Timms			
Status	Checked by	Date	Approved for C&W by	Date
V1.0	Tom Clarkson	12/07/18	Peter Timms	17/0718
V2.0 red line boundary updated			Peter Timms	16/11/18

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.





## 1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by INRG Solar (Little Crow) Ltd to carry out an ecological survey of land of land proposed to accommodate Little Crow Solar Farm near Santon in Lincolnshire.
- 1.1.2 This report presents the findings of the extended phase 1 habitat survey, a rare arable plants survey, a great crested newt survey and a water vole survey.
- 1.1.3 The Phase 1 Habitat survey was carried out over several dates on 26<sup>th</sup> & 27<sup>th</sup> July, 2<sup>nd</sup> August and 15<sup>th</sup> September 2017. The results of the survey have been augmented from additional site visits undertaken during 2017-2018 associated with detailed surveys for a number of target ecological features.
- 1.1.4 The arable plants survey was conducted on the 12<sup>th</sup> and 13<sup>th</sup> of June 2018.
- 1.1.5 The great crested newt surveys were conducted on 24<sup>th</sup> April and 19<sup>th</sup> June 2018.
- 1.1.6 The water vole surveys were conducted on 14<sup>th</sup> and 15<sup>th</sup> September 2017, and 23<sup>rd</sup> April 2018.
- 1.1.7 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.
- 1.2 Site Description Summary
  - 1.2.1 The site is located to the east of the town of Scunthorpe and consists of 17 (predominantly arable) fields bordered by a network of hedgerows and extensive woodland plantations. The land gradually slopes down to the west of the site, where a number of ditches and ponds are present. Grassland, scrub and ruderal habitat are also present in discrete areas around the site.
  - 1.2.2 The wider landscape is characterised by the industrial steel workings to the west of the site, and further arable farmland and plantation woodland to the north and east. Beyond the woodland to the south lies a recently constructed solar array. The town of Broughton is located approximately 0.9km to the east of the site.
  - 1.2.3 The development site is approximately 220 hectares (ha) in size, and the approximate centre of the site was at OS Grid Ref. SE 941 099. The location of the site is shown in Figures 1 and 2.

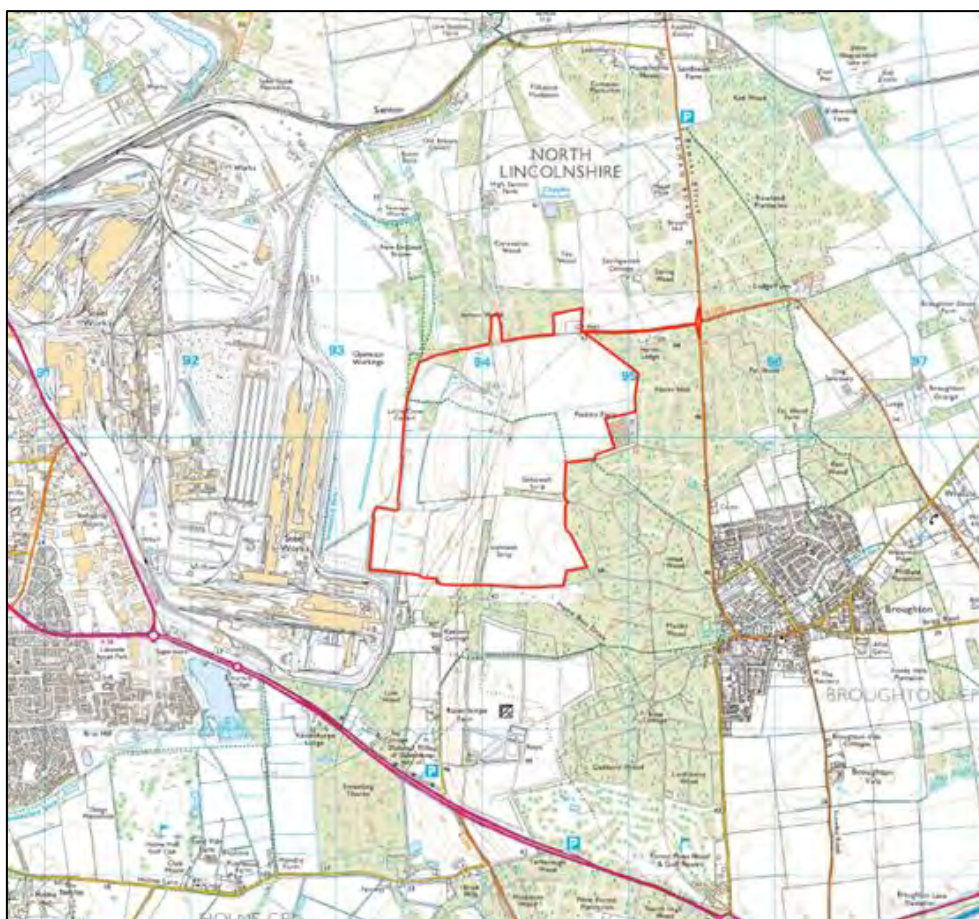


Figure 1: Ordnance Survey Map Showing Location of Site (OS Licence 100050456)

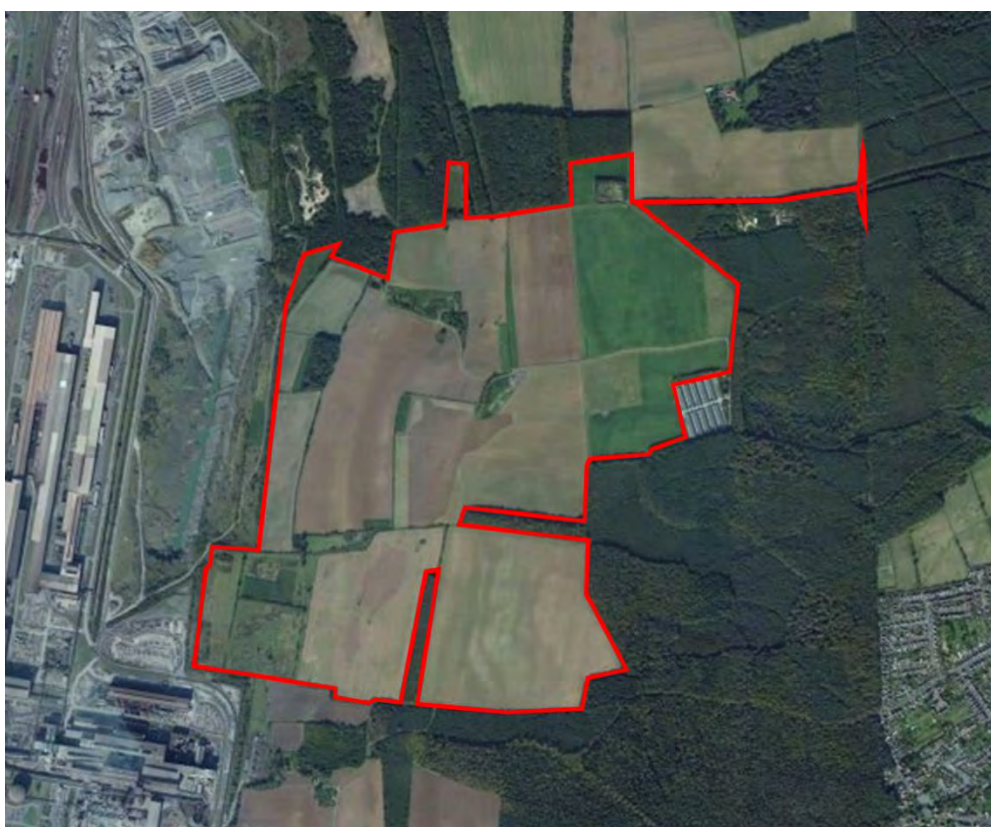


Figure 2: Aerial photograph of Site boundary (©2018 Microsoft)



## 2 SURVEY AND ASSESSMENT METHODOLOGY

### 2.1 Data Search

- 2.1.1 Statutory designated sites within proximity of the Site were identified using the Natural England/DEFRA web-based MAGIC database ([www.MAGIC.gov.uk](http://www.MAGIC.gov.uk)).
- 2.1.2 Ordnance Survey maps (1:25,000) and aerial images of the Site were examined online ([bing.com/maps](http://bing.com/maps) and [maps.google.co.uk](http://maps.google.co.uk)).
- 2.1.3 The Lincolnshire Environmental Records Centre (LERC) was consulted for records of protected and notable species within 2km of the site. The records centre was also asked to provide details of designated sites within 1km of the site.

### 2.2 Field Survey

#### *Personnel*

- 2.2.1 The extended Phase 1 Survey was undertaken by Peter Timms ACIEEM. Peter has 6 years' experience undertaking ecological surveys and has a BSc and MSc in relevant subjects. Peter holds a Natural England class licence (Level 1) for the survey of great crested newts (Registration Number: 2015-19739-CLS-CLS).
- 2.2.2 A survey for arable plant species was undertaken by Mark Baker MCIEEM. Mark has over 12 years' experience undertaking botanical and ecological surveys and has a BSc in a relevant subject.
- 2.2.3 The following staff members also assisted with the water vole surveys and the collection of water samples for eDNA analysis:
  - Phil Bowater BSc Grad CIEEM
  - Patrick Ellison BSc Grad CIEEM
  - Chris Poole BSc Grad CIEEM
- 2.2.4 All above staff have been assessed under the Clarkson and Woods QA processes as competent to complete the survey.

#### *Habitats*

- 2.2.5 A habitat survey was carried out based on standard field methodology set out in the *Handbook for Phase 1 Habitat Survey* (2003 edition)<sup>1</sup>.
- 2.2.6 Botanical names follow Stace (1997)<sup>2</sup> for higher plants and Edwards (1999)<sup>3</sup> for bryophytes.
- 2.2.7 Habitats are mapped following the codes and conventions described within the Phase 1 Habitat Survey Handbook and Target Notes (Table 3) are used to describe habitats not readily conforming to recognised types and evidence of or suitability for protected species and species of conservation concern.

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<sup>1</sup> Nature Conservancy Council. (1990 - 2003 edition). *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit*, Joint Nature Conservation Committee

<sup>2</sup> Stace, C. (1997). *New Flora of the British Isles Second Edition*. Cambridge University Press

<sup>3</sup> Edwards, S.R. (1999). *English Names for British Bryophytes*. BBS, Cardiff



### *Arable Plants*

- 2.2.8 A targeted survey for arable plant species (sometimes called arable weed species) was undertaken during the 12<sup>th</sup> and 13<sup>th</sup> June 2018. The margins of all arable fields were initially walked over by an experienced ecologist in order to rapidly assess the distribution of arable plants across the site. Areas noted to be of interest in terms of abundance and diversity of arable plants were then subject to more detailed survey. The location of these arable plant survey target zones are provided in Figure 5.
- 2.2.9 The survey used a modified version of the Plantlife Arable Plants Survey Form and adopted a methodology whereby areas noted to be of interest in the rapid assessment were then subject to a detailed inspection with all arable plant species being recorded. Each area was subjected to an extended and detailed search with all species within the area (other than crops) being recorded. Where threatened species were recorded these were ascribed a score according to the Plantlife Important Arable Plant Areas Methodology<sup>4</sup>
- 2.2.10 Arable plant species encountered and their relative abundance within each target survey zone were recorded and described using the DAFOR scale shown below:
- *D – Dominant*
  - *A – Abundant*
  - *F – Frequent*
  - *O – Occasional*
  - *R – Rare*
- 2.2.11 The quality of each arable area was assessed against the three criteria identified by Plantlife in identifying important arable plant areas<sup>4</sup>.

### 2.3 Protected and Notable Species

- 2.3.1 Details of the legislative protection afforded to those protected species which have been identified as occurring or potentially occurring on the site are detailed in Appendix A.

### *Badgers*

- 2.3.2 A search was made for badger *Meles meles* setts, and sett entrances were checked for signs of use by badgers or other mammals. Setts were classified into the following categories; Main, Subsidiary, Annexe or Outlying. Main setts are typically large structures which constitute the principal shelter and breeding location for a single social group. Subsidiary setts are significant setts which receive regular or sporadic usage but are not the focal sett for a social group. Annexe setts are smaller structures closely associated with Main setts but are not connected by underground tunnels. Outlying setts are located away from other setts and usually comprise no more than two, infrequently used sett entrances.
- 2.3.3 Sett entrances were counted and mapped to record tunnel direction and their relative level of usage.
- 2.3.4 Field signs such as 'snuffle holes' (holes dug by badgers when searching for invertebrates), pathways through vegetation, 'latrines' (small pits in which badgers deposit their faeces) and 'day nests' (nests of bedding material made by badgers for sleeping above ground) were also mapped.

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<sup>4</sup> Byfield, A.J. & Wilson, P. J. (2005). Important Arable Plant Areas: identifying priority sites for arable plant conservation in the United Kingdom. Plantlife International, Salisbury, UK





## Bats

- 2.3.5 The assessment of the suitability of the site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust<sup>5</sup>.
- 2.3.6 *Trees*: an inspection of trees on site was carried out from the ground, using binoculars, to record any signs of use of the tree by bat species. A ladder, powerful torch and a video fibrescope were available. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.
- 2.3.7 *Habitat*: the habitats within the site were appraised for their suitability for use by foraging and commuting bats. In particular, the connectivity of the habitats on site to those lying beyond was taken into account. Vegetated linear features are typically important for many species to navigate around the landscape, while the presence of woodland, scrub, gardens, grassland and wetland features **increases a site's foraging resource value** to bats. The potential for noise or lighting disturbance which may affect commuting links was also recorded.
- 2.3.8 Detailed bat activity surveys have been conducted at the site. The details of outlined in a separate Appendix (7.4)

## Otter

- 2.3.9 A search was made along the banks of water courses and water bodies and their adjacent habitats for otter *Lutra lutra* signs including spraints, tracks, castling, and rolling. The banks of any water courses were searched for the presence or potential for holts or other sheltering areas.

## Water Vole

- 2.3.10 A water vole survey was carried out following guidance in the Water Vole Conservation Handbook – 3<sup>rd</sup> Edition<sup>6</sup> and the Mammal Society's Water Vole Mitigation Handbook<sup>7</sup>.
- 2.3.11 Given that habitat suitability for water voles can change significantly throughout the course of the breeding season, the Mitigation Handbook recommends that two survey visits for the species are necessary to confirm presence or likely absence in most cases. One of these surveys should be completed in the first half of the water vole breeding season (mid-April to the end of June) and the other in the second half of the season (July to September inclusive) and the surveys should be two months apart.
- 2.3.12 The first water vole survey was undertaken on the 14<sup>th</sup> and 15<sup>th</sup> September 2017 by Peter Timms, with a second survey undertaken on 23<sup>rd</sup> April 2018 by Peter Timms, Patrick Ellison and Phil Bowater.
- 2.3.13 The surveys were carried out along the length of the ditch network at the site, which is primarily within the western part of the site. Both banks of the river were surveyed where possible and safe to do so. Where access was permitted, the survey area extend 100m up and downstream of the ditch network

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<sup>5</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

<sup>6</sup> Rob Strachan, Tom Moorhouse and Merryl Gelling (2011), Water Vole Conservation Handbook (3<sup>rd</sup> ed.), Wildlife Conservation Research Unit (WildCRU)

<sup>7</sup> Dean, M., Strachan, R., Gow, D. & Andrews, R. (2016). *The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series)*. Eds Fiona Matthews & Paul Chanin. Mammal Society, London.



off-site. Where the ditch network extended into the steelworkings off-site to the west of the site, no permissible access was available to extend the survey into this area. It is nevertheless considered that adequate survey effort has been made so that water voles would have been detected if they had been present within the development site. The area covered by the surveys is shown in Figure 6.

- 2.3.14 The ditch banks within the survey area were systematically searched, extending to at least 1m from the **water's edge, for signs of water vole including: latrines** (showing discrete piles of droppings); feeding remains with characteristically cut vegetation; burrow entrances above and below the water line; runways and footprints; sightings and sounds, particularly listening for the characteristic 'plop' of a water vole entering the water as a result of having been disturbed

#### *Amphibians*

- 2.3.15 All waterbodies within 500m of the Site were identified using Ordnance Survey maps and aerial imagery. Waterbodies within the site ownership and on publically accessible land were assessed during the field survey for their suitability to support amphibian species.
- 2.3.16 Where suitable water bodies were identified on accessible land a Habitat Suitability Index (HSI) score was calculated for each one following the methodology described by Oldham et al<sup>8</sup>. HSI scores give a relative indication of the likelihood that a water body would support breeding great crested newts. Factors which increase these scores include the presence of other ponds nearby, water quality, pond size, absence of fish/waterfowl, vegetation cover and shading.
- 2.3.17 Terrestrial habitats were also assessed for their suitability for foraging and sheltering amphibians. Amphibians require habitats such as grassland, scrub, woodland and hedgerows for dispersal and hibernation. Further hibernation features include buried rubble and logs, or mammal burrows.

#### *eDNA Survey*

- 2.3.18 Five ponds within the site were subject to eDNA survey on 24<sup>th</sup> April 2018. This was carried out within the optimal survey window (15<sup>th</sup> April and 30<sup>th</sup> June) to determine presence/likely absence. Surveys were carried out following best practice as outlined in the Defra Project WC1067<sup>9</sup>.
- 2.3.19 The surveyed ponds contained >10cm water with full surveyor access to collect samples around the pond perimeter where possible. Care was taken to ensure that the water was not contaminated from other sources and that any sediment present was not stirred up to contaminate the samples. There were no constraints to sampling of the pond that may have resulted in provision of false positive or negative results.
- 2.3.20 The eDNA kit was provided and water samples analysed by ADAS UK.
- 2.3.21 Two of the ponds, which initially returned indeterminate results, were subsequently resampled on 19<sup>th</sup> June 2018. On this occasion, the eDNA kits were provided and water samples analysed by SureScreen Scientifics.

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<sup>8</sup> Oldham, R.S., Keeble L., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

<sup>9</sup> Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.



### *Reptiles*

- 2.3.22 Features on site were assessed for their potential to provide suitable habitats for use by reptile species. These include rough, tussocky grassland, scrub, disturbed land or refugia such as wood piles, rubble or compost heaps. Where present, suitable existing refugia were inspected for sheltering reptiles, and the ground was scanned whilst walking to look for basking species.

### *Birds*

- 2.3.23 Breeding and wintering bird surveys have been conducted at the site, the details of which are outlined in Appendix 7.2 and 7.3

### *Invasive Species*

- 2.3.24 Invasive species, such as Japanese knotweed *Fallopia japonica* and Himalayan Balsam *Impatiens glandulifera* were searched for and recorded.

### *Other Notable Species and Species of Conservation Concern*

- 2.3.25 Field signs indicating the presence of other species of conservation concern, such as hares *Lepus europaeus*, harvest mice *Micromys minutus* and hedgehogs *Erinaceus europaeus* (Species of Principal Importance under the NERC Act (2006)) were recorded. Habitats were also assessed for their potential to support such species.

## 2.4 Quality Assurance

- 2.4.1 All ecologists employed by Clarkson and Woods are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct<sup>10</sup> when undertaking ecological work.
- 2.4.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)<sup>11</sup>.
- 2.4.3 This report has been prepared in accordance with the relevant British Standard: BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development<sup>12</sup>.

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<sup>10</sup> CIEEM (2013). Code of Professional Conduct. [www.cieem.net/professional-conduct](http://www.cieem.net/professional-conduct).

<sup>11</sup> CIEEM (2013). Competencies for Species Survey (CSS). [www.cieem.net/competencies-for-species-survey-css](http://www.cieem.net/competencies-for-species-survey-css).

<sup>12</sup> The British Standards Institution (2013). BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development. BSI Standards Ltd.



### 3 SURVEY LIMITATIONS

#### 3.1 Desk Study

3.1.1 The data presented within the report should not be seen as exhaustive. Data obtained from within the search area is highly unlikely to constitute a complete record of habitats and species present within the search area. It is therefore possible that protected species may occur within the vicinity of the proposed development site that have not been identified within the desk study.

3.1.2 The data presented within the desk study section of this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

#### 3.2 Arable Plants

3.2.1 The majority of arable plant species are annuals and require suitable conditions in order to perform their life cycle in a given year. As such there may be arable plant species present in the seed bank that were not recorded during the surveys but that may appear in another year.

3.2.2 The arable plant survey was generally focused on the field margins at the site and it was not possible to survey the entire ground within the circa 209ha of arable land. Arable plants growing amongst crops are likely to have been missed if present with the centre of fields. However, arable plants do not generally flourish within the centre of conventionally managed arable crop fields, due to herbicide use and being outcompeted by crops, and it is therefore unlikely that or highly-diverse areas or abundant weed growth would have been missed. The survey approach taken is therefore considered likely to have identified the key areas of arable plants present at the site.

#### 3.3 Water Voles and Otters

3.3.1 Otters have no defined breeding season and the breeding holt is kept deliberately obscure by the female so locating one can be difficult and time consuming.

3.3.2 Where water voles live at low densities or a site is at the edge of their range, field signs can be very limited.

#### 3.4 Badgers

3.4.1 Areas with dense ground cover (hedges, scrub, woodland etc. were examined closely. If impenetrable vegetation prevented entry then the perimeter was examined in order to detect badger paths suggesting a hidden sett within the area. It cannot be guaranteed that all the entrances have been located, especially if a small sett is currently inactive or used seasonally and concealed in an area of thick scrub. Badgers may dig new holes and create new setts in a very short space of time.

#### 3.5 General

3.5.1 This survey offers only a series of 'snapshots' of the site and takes no account of seasonal differences, or of any species which might choose to take up residence subsequently. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.





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- 3.5.2 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.



## 4 DESK STUDY

### 4.1 Data Search – Designated Sites

#### *International Designations within 10km of the Site*

- 4.1.1 The Humber Estuary is designated a Special Protection Area (SPA), Special Conservation Area (SAC) and Ramsar site. The area encompassing the SPA is situated approximately 11km north of the site at the closest point, whilst the SAC and Ramsar site is located 9km west at the closest point. It primarily receives its designation for its estuarine habitats, which support a range of associated species including internationally important assemblages of wintering and migratory birds.

#### *National Designations within 5km of the Site*

- 4.1.2 Five Sites of Special Scientific Interest (SSSIs) are located within 5km of the application site, and are described below:

#### Broughton Far Wood SSSI

- 4.1.3 This is an extensive block of commercial woodland located approximately 820m east of the proposed solar array, although is 350m from the site access (which will utilise an existing farm track). This is designated for its rich woodland canopy and ground flora, as well as its areas of herb-rich limestone grassland in the north east corner.

- 4.1.4 The SSSI is separated from the application site by further woodland plantation, arable fields and the B1207 road.

#### Broughton Alder Wood SSSI

- 4.1.5 Situated approximately 1km east of the main development site, and is designated for its wet, alder *Alnus glutinosa* woodland and associated fen and spring habitats and flora. It is separated from the development site by extensive plantation woodland, the B1207 road, and a poultry farm.

#### Risby Warren SSSI

- 4.1.6 This is a remnant area of heathland which supports a variety of associated plant communities, include dune, heathland, acid and calcareous grassland which are affected by airborne pollution from the nearby industrial sites. Tree cover on the SSSI comprises coniferous shelter belt planting and as well as scattered birch *Betula sp.* and gorse *Ulex europaeus*. This is located approximately 2.65km north west of the site and is separated from the application site by plantation woodland, agricultural farmland, heavy industry and quarry workings.

#### Manton and Twigmoor SSSI

- 4.1.7 This comprises a complex of three separate sites, which are located approximately 3.1km south of the site at the closest point. Important habitats supported by the SSSI include heathland, acid grassland and wetland features, with wet woodland also present. Together the site components support a diverse range of associated floral species. The intervening landscape comprises woodland plantations, an existing solar array, a golf course and the busy A18 and M180 roads.

#### Castlethorpe Tufas SSSI

- 4.1.8 This is situated approximately 3.4km and is designated for its' geological interest.



### Local Designations within 1km of the Site

4.1.9 Eleven locally designated sites for nature conservation are located within 1km of the application, which are described in Table 1. Of these, eight are Local Wildlife Sites (LWSs) selected by the Greater Lincolnshire Nature Partnership due to their importance for wildlife at a local level. Three sites are Sites of Nature Conservation Interest (SNCIs), the status of which has been superseded by the LWSs, but these sites retain SNCI status until they have been assessed against the LWS criteria.

Table 1: Non-statutorily designated sites within 1km of the application site

Site	Designation	Description	Size (ha)	Distance and bearing from site
Manby Wood	LWS	Botanically diverse wooded area, primarily consisting of broadleaved plantation with small areas of young coniferous plantation. Supports a variety of associated ground flora.	80.1	Adjacent to south-eastern boundary of site
Heron Holt	LWS	Woodland with parts containing diverse range of deciduous species and structural variety, with other parts consisting of dense pine and sycamore plantation. Supports a variety of woodland ground flora.	33.3	Adjacent to eastern boundary of site
Broughton West Wood	LWS	Mostly mature deciduous plantation, representative of re-planted ancient woodland, with substantial areas of younger growth and some coniferous elements. Very rich in woodland botany.	83.8	Adjacent to eastern boundary of site
Santon Wood East	LWS	A strip of field edge woodland connecting two planted woodland blocks of varying age and structure, which contains some ancient woodland indicator species.	6,77ha	Adjacent to north eastern boundary of site
Broughton Far Wood	LWS	Botanically diverse plantation woodland containing mature or maturing broadleaved trees with some pine in places.	50.8	440m east
Gadbury and Lundimore Woods	LWS	Mixed plantation woodland considered to represent re-planted ancient woodland, supporting diverse ground flora. Known to support common pipistrelle <i>Pipistrellus pipistrellus</i> bat roosts.	81.5	450m south
Rowland Planation	LWS	Dominated by botanically-poor woodland plantation, although supports some areas with richer ground flora, and also contains diverse grassland rides and a small area of wetland	121	560m east
Far Wood Farm Meadow	LWS	An area of marsh, drier grassland and coarse vegetation formally cropped for hay. Supports diverse range of flush and grassland botany.	1.9	800m east
Broughton West Wood	SNCI	Two strips of woodland shelter belts, predominantly consisting of deciduous plantation woodland with a small element of coniferous growth. Occasionally diverse woodland ground flora found in some areas. Support a wide range of typical woodland bird species.	6	Adjacent to south eastern boundary of site
Santon Wood	SNCI	Deciduous plantation woodland managed for forestry. Contains some good woodland ground flora.	101	Adjacent to north western boundary, contains part of the application site
Spring Wood Boughton	SNCI	Dense coniferous plantation woodland with very little ground flora	9.2	230m north of site access

4.1.10 Parts of Manby Wood LWS and Broughton West Wood are considered to represent Plantations on Ancient Woodland Sites (PAWS) due to notable presence of mature ancient woodland indicator species.



## 4.2 Data Search – Protected and Notable Species

*Data obtained from Lincolnshire Environmental Records Centre*

- 4.2.1 Data was obtained from Lincolnshire Environmental Records Centre (LERC) on all notable species within 2km of the site boundary.

### *Badger*

- 4.2.2 Eight records (post-2000) of badgers were returned from the data search, the closest being a road casualty approximately 110m north east of the site. Five records of setts from woodland approximately 1km west of the site were also returned.

### *Bats*

- 4.2.3 A number of existing records of at least six species of bats were obtained from the records centre, the closest of which were field recordings of unidentified bat species within woodland adjacent to the south east of the site.
- 4.2.4 A number of field records of common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* exist from areas of woodland approximately 1km east of the site. Field records of this species, as well as Daubenton's bat *Myotis daubentonii* exist from Ashbyville Lake, approximately 1.3km south west of the site. Single records of Nathusius' pipistrelle *Pipistrellus nathusii* and Whiskered bat *Myotis mystacinus* occur within Scunthorpe and approximately 1.5km west of the site.
- 4.2.5 Unspecified common pipistrelle and brown long-eared *Plecotus auritus* roosts are also known to be present within the town of Broughton, approximately 1km east of the site.

### *Otter and Water Vole*

- 4.2.6 A record of an otter spraint from 1996 exists, located approximately 200m north of the site.
- 4.2.7 Water voles have been recorded on Bottesford Beck, approximately 1.95km south west of the site, most recently in 2013.

### *Amphibians*

- 4.2.8 Great crested newt *Triturus cristatus* records exist from 2006. The exact location these records were taken from is unclear but is believed to be from close to the south west boundary of the site. A small number of records of common toad *Bufo bufo* are also present within the search area.

### *Reptiles*

- 4.2.9 Records of reptiles from within the search area are limited to a record of grass snake from 1977, from an unspecified location.

### *Birds*

- 4.2.10 A number of records of notable bird species were obtained from the records centre. These are documented within the wintering bird survey and breeding bird survey report in separate Appendices (7.2 & 7.3).



## Invertebrates

4.2.11 Several moth and butterfly species which are listed as Species of Principal Importance<sup>13</sup> have been recorded within 2km of the site since 2000. These include grey dagger *Acronicta psi*, mouse moth *Amphipyra tragopoginis*, dusky brocade *Apamea remissa*, garden tiger *Arctia caja*, sprawler *Asteroscopus sphinx*, mottled rustic *Caradrina morpheus*, latticed heath *Chiasmia clathrata*, sawfly *Cirrhia icteritia*, small heath *Coenonympha pamphilus*, small square-spot *Diarsia rubi*, small phoenix *Ecliptopera silaceata*, august thorn *Ennomos quercinaria*, autumnal rustic *Eugnorisma glareosa*, white-line dart *Euxoa tritici*, ghost moth *Hepialus humuli*, grayling *Hipparchia semele*, rustic *Hoplodrina blanda*, wall *Lasiommata megera*, shoulder-striped wainscot *Leucania comma*, rosy minor *Litoligia literosa*, lackey *Malacosoma neustria*, dot moth *Melanchra persicariae*, pretty chalk carpet *Melanthia procellata*, dark spinach *Pelurga comitata*, large wainscot *Rhizedra lutosus*, white-letter hairstreak *Satyrus w-album*, shaded broad-bar *Scotopteryx chenopodiata*, white ermine *Spilosoma lubricipeda*, buff ermine *Spilosoma lutea*, hedge rustic *Tholera cespitis*, feathered gothic *Tholera decimalis*, blood-vein *Timandra comae*, cinnabar *Tyria jacobaeae* and dark-barred twin-spot carpet *Xanthorhoe ferrugata*.

4.2.12 The majority of small heath, grayling, and wall records were from Yarborough Quarry, approximately 350m north west of the site. The records of all other species were primarily located at either Ashbyville Lake (1.5km south west of the site) or at woodland areas approximately 1km east.

## Plants

4.2.13 A number of records of notable plant species have been recorded within 2km of the site. These include two Species of Principal Importance; Purple milk vetch, of which records exist from on the site, and yellow bird's nest, which has been recorded approximately 950m north of the site

## MAGIC search for EPS Licences

4.2.14 Records of previously issued European Protected Species Licences from within 5km of the site were obtained using the MAGIC website. Details of these licences are provided in Table 2 below.

Table 2: MAGIC records of EPS mitigation licences issued within a 2km radius of the site

Licence Ref No.	Species Covered	Dates of Licence	Distance and bearing from Site of Licence Record
2015-7054-EPS-MIT	Bats – Common pipistrelle	2015-2025	1.37km Southeast
EPSM2009-1229	Bats – Soprano pipistrelle	2009-2010	2.35km Northeast
EPSM2010-2663	Bats – Common pipistrelle	2011	4km Northwest
2015-16065-EPS-MIT	Bats – Common pipistrelle	2015-2020	5km Northwest
2015-16065-EPS-MIT-1	Bats – Common pipistrelle	2016-2020	5km Northwest
2015-16065-EPS-MIT-2	Bats – Common pipistrelle	2016-2020	5km Northwest

<sup>13</sup> Species of Principal Importance (SPI) are listed in Schedule 41 of the Natural Environment and Rural Communities (NERC) Act as requiring action under the UK Biodiversity Action Plan

## 5 EXTENDED PHASE 1 SURVEY

- 5.1.1 The site consisted of 17 (predominantly arable) fields bordered by a network of hedgerows and extensive woodland plantations. The land gradually slopes down to the west of the site, where a number of ditches and ponds are present. The results of the ecological survey are shown on Figure 4 at the end of this section

### 5.2 Habitats

#### *Arable*

##### Arable fields

- 5.2.1 This was the most frequently encountered habitat at the site, accounting for approximately 211ha of the land within the survey area. Over the course of the surveys, the arable fields were under cultivation using a mix of spring-sown cereals and rapeseed, as well as game cover crops within discrete areas at the edges of some of the fields.

##### Arable Field Margins

- 5.2.2 The margins of the arable fields were generally narrow (0.5m to 2m wide), although extended to 6m in places, and comprised typical coarse grasses and herbaceous species, including: false-oat grass *Arrhenatherum elatius*; **cock's foot** *Dactylis glomerata*; black grass *Alopecurus myosuroides*; perennial ryegrass *Lolium perenne*; nettle *Urtica dioica*; hogweed *Heracleum sphondylium*; common poppy *Papaver rhoeas*; fat hen *Chenopodium album*; greater knapweed *Centaurea scabiosa*; common knapweed *Centaurea nigra*; prickly sow-thistle *Sonchus asper*; groundsel *Senecio vulgaris*; red campion *Silene dioica*; white campion *Silene latifolia*; redshank *Persicaria maculosa*; mugwort *Artemisia vulgaris*; ragwort *Jacobaea vulgaris*; soft brome *Bromus hordeaceus*; scentless mayweed *Tripleurospermum inodorum*; wall barley *Hordeum murinum*; common fumitory *Fumaria officinalis*; borage *Borago officinalis*; and bracken *Pteridium aquilinum* in some parts.
- 5.2.3 Additional species recorded during the arable plants survey included **fool's parsley** *Aethusa cynapium*, bugloss *Anchusa officinalis*, **goat's beard** *Tragopogon pratensis*, henbane *Hyoscyamus niger*, wild pansy *Viola tricolor*, **shepherd's purse** *Capsella bursa-pastoris*, cut-leaved cranesbill *Geranium dissectum*, wild mignonette *Reseda lutea* and annual nettle *Urtica urens* (see Section 6 for detailed results of the arable plants survey).



Photograph 1: Typical arable field and margin habitat encountered across much of the site. Photo taken from Field F4, looking east.



Photograph 2: Field margin with arable plants. Photo taken from Field F6, looking south.

- 5.2.4 Uncultivated strips of grassland 2-6m wide were present on either side of farm tracks running through the site and at some headlands around arable fields, particularly in the north east of the site. The vegetation within these habitats was similar in composition to the rest of the arable field margins described above, although evidence that this habitat was subject to less frequent disturbance was noted; a layer of thatch was present and a higher abundance of floral species was present, such as field speedwell *Veronica persica*; black horehound *Ballota nigra*; vipers' blugloss *Echium vulgare*; doves-foot cranebill *Geranium molle*; hairy vetch *Vicia hirsute*; burdock *Arctium lappa*; and teasel *Dipsacus fullonum* in addition to that recorded elsewhere within arable fields. For the purposes of this assessment, these grassland strips were considered to represent semi-improved grassland although they have been included under the broad habitat type of Arable Field Margins.
- 5.2.5 Although the arable fields were cultivated up to the field boundaries with generally only narrow margins present, the total extent of this habitat type at the site is approximately 3ha, and arable field margins are a priority habitat identified as a conservation target both locally and nationally.
- 5.2.6 Of the arable plant species recorded on the site, henbane, which was recorded in Field F8 in the north western corner of the site, is classified as Vulnerable on the vascular plant Red Data Book for Great Britain<sup>14</sup>. A species is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium term future. See Section 6 for further details of the findings of the arable plant survey.

#### *Semi-improved Grassland*

- 5.2.7 Areas of agricultural land in the south west of the site were dominated by rank grasses and herbs, particularly false-oat grass, as well as hogweed; nettle; marsh thistle *Cirsium palustre*; creeping thistle *Cirsium arvense*; great willowherb *Epilobium hirsutum*; and hairy vetch. In damper areas, rush species soft rush *Juncus effusus* and toad rush *Juncus bufonius* were noted. This habitat is readily-establishing and was not considered to offer elevated ecological compared to habitats within the wider landscape.

<sup>14</sup> Cheffings, C.M. & Farrell, L. (2005) *Species Status Report No 7: The Vascular plant red data list for Great Britain*. Joint Nature Conservation Committee, Peterborough.



- 5.2.8 An area of semi-improved grassland containing abundant orchids was present in the north of Field F11 (Target Note 15), around the edges of the raised circular mound at Target Note 11 and extending east of this feature. Common spotted orchid *Dactylorhiza fuchsia* was frequently encountered as was northern or southern marsh orchid *Dactylorhiza praetermissa* / *Dactylorhiza purpurella*, as well as occasional bee orchid *Ophrys apifera*. Although these orchid species are widespread in the UK and can be found in a range of habitats, the presence of these signifies this area as likely to have been subject to less improvement than the other grassland habitat present at the site.



Photograph 3: Typical poor semi-improved grassland habitat at the south west of the site. This photo shows Field F12.



Photograph 4: Grassland with abundant orchid species at Target Note 15, in the north of Field F11.

#### *Improved Grassland*

- 5.2.9 A block of mown improved grassland measuring approximately 3.5ha and dominated by cock's foot was present in the north west of Field F2.

#### *Semi-natural Broad-leaved Woodland*

- 5.2.10 Much of the site was bordered by woodland, although the majority of woodland habitat comprised planted mixed/broadleaved woodland (see below). However, just beyond the western boundary of Fields F10 and F9 lay a strip of semi-natural riparian woodland on the banks of a stream, sloping down some 5-10m to the stream below and covering an area of approximately 1.5ha. This habitat comprised





semi-mature oak *Quercus robur*; silver birch *Betula pendula*; hawthorn *Crataegus monogyna*; goat willow *Salix caprea*; alder *Alnus glutinosa*; and elder *Sambucus nigra*.

- 5.2.11 An area of this habitat measuring 0.25ha was also present at the junction of three hedgerows in the south west of the site, which comprised mature oak, lime *Tilia sp*; hawthorn; elder; silver birch; and grey willow, and an understorey of enchanter's nightshade *Circaea lutetiana* and wood avens *Geum urbanum*. This was damp and held standing water over the winter months.

#### *Plantation Broad-leaved Woodland*

- 5.2.12 Much of the woodland beyond the northern and south eastern boundary of the site comprised planted broadleaved trees as well as a roughly rectangular area of 1.75 ha in between arable land within the western area of the site.
- 5.2.13 Although this varied in age and species composition between different areas of the site, generally speaking this comprised abundant semi-mature to mature ash *Fraxinus excelsior*; oak; Norway maple *Acer platanoides*; poplar *Populus sp.*; silver birch; and sycamore *Acer pseudoplanatus*. Hawthorn; blackthorn *Prunus spinosa*; sweet chestnut *Castanea sativa*; hazel *Corylus avellana* were also frequently encountered with an associated ground flora noted at the edges of the woodlands close to the site boundary, including species such as bramble *Rubus fruticosus*; ivy *Hedera helix*; wood avens; lords-and-ladies *Arum maculatum*; and nettle.
- 5.2.14 Much of this habitat at the site boundaries are locally designated Sites of Nature Conservation Interest (see above). This habitat also represents Lowland Mixed Deciduous Woodland, which is a local and national priority habitat.

#### *Plantation Mixed Woodland*

- 5.2.15 Although predominantly consisting of broad-leaved species, parts of the woodland bordering the southern and western parts of the site contained an element of coniferous plantation. Species such as larch *Larix decidua*, scot's pine *Pinus sylvestris* and Corsican pine *Pinus nigra* were recorded in these areas amongst the broadleaved species described above. The woodland beyond the south east corner of the site, within Broughton Far Wood LWS and Manby Wood LWS) is classed as 'plantation on an ancient woodland site' (PAWS), and the understorey in this area was noted to be more representative of mature woodland, with species such as enchanter's nightshade, green alkanet *Pentaglottis sempervirens* and dog's mercury *Mercurialis perennis* noted.
- 5.2.16 A small area of this habitat (approx. 0.1 ha) was present within the north western part of the site, alongside a stream, and comprised planted larch, poplar *Populus sp.* and cypress trees with young hawthorn and elder.
- 5.2.17 This habitat is likely to support a wide range of associated wildlife, and is representative of the priority habitat Lowland Mixed Deciduous Woodland. Much of this habitat also forms part of designated Local Wildlife Sites.

#### *Plantation Coniferous Woodland*

- 5.2.18 An area of woodland comprising entirely of planted larch was present beyond the southern boundary of the site. This habitat was relatively small in extent (approx. 1.1ha) and low in both species composition and structural diversity, and provided fewer opportunities for wildlife compared to the other types of woodland at the site.

### *Scrub*

- 5.2.19 Areas of dense, unmanaged scrub were occasionally encountered in the centre of the site, as well as more frequently along the western site boundary. In most places, this habitat usually comprised semi-mature hawthorn; bramble; blackthorn; elder; and young willow. Scattered stands of scrub were occasionally encountered elsewhere at the site, such as at field margins and along ditch banks. Although this habitat is likely to support a range of protected and notable wildlife species, it is readily establishing and frequently found in the wider landscape.



Photograph 5: Area of scrub habitat at Target Note 3, parallel to Hedgerow H2

### *Hedgerows*

- 5.2.20 The agricultural fields were bordered in parts by a network of eighteen hedgerows. These are labelled in Figure 4 and a description of each hedgerow is provided in Table 4.
- 5.2.21 The majority were poor in terms of species diversity, although species-rich hedgerows are present at the site. The hedgerows also varied in structural diversity; some were relatively intact whereas frequent gaps were noted in others, and trees were present in some, with others being managed at a uniform height. In total, the hedgerow habitat at the site measured approximately 4.55km in length.
- 5.2.22 The hedgerows are likely to be of importance for a wide range of associated wildlife, and provide connective links to between valuable habitat within and adjacent to the site. Hedgerows in general are a priority habitat for Lincolnshire as well as on a national scale.

### *Ponds*

- 5.2.23 Five ponds were present within the survey area. These are labelled in Figure 4 and a description of each is provided in Table 5. Two of the ponds appeared to be ephemeral and dried up during spring and early summer (Ponds 4 & 5). A small field pond present at the northern edge of the site (Pond 3) was shallow, heavily silted and overshadowed by an adjacent tree, with very little aquatic vegetation present. The remaining two ponds were larger, more open and likely to hold water year-round, and were seen to support a range of marginal and aquatic vegetation.
- 5.2.24 Two further ponds were noted off-site but within 500m, situated approximately 100m west and 330m south respectively. These have not been surveyed at the time of writing due to a lack of permissible access.

### Scattered Broadleaved Trees

- 5.2.25 A small number (5) of semi-mature to mature trees were present at the site which were not associated with adjacent woodland or field boundaries. These generally comprised ash trees, with an oak, a horse chestnut *Aesculus hippocastanum* and a weeping willow *Salix babylonica* also present. None of the trees were considered to represent good examples of veteran trees, as they were generally similar in age and size to the trees at the nearby woodland and hedgerows, and did not occupy prominent positions in the landscape.

### Tall Ruderal

- 5.2.26 Discrete parts of the site outside of the cultivated fields were dominated by tall ruderal species, particularly nettle, great willowherb, meadowsweet *Filipendula ulmaria*, mugwort, burdock marsh thistle, ragwort and hogweed.



Photograph 6: Tall ruderal habitat at Target Note 1

### Ditches

- 5.2.27 A network of drainage ditches were present at some of the field boundaries. At the time of survey, nearly all of the ditches were dry or held very little water over the summer months, although aquatic/marginal vegetation could be seen which indicated seasonal inundation with water.



Photograph 7: Dry Ditch between Fields F9 and F7



5.2.28 A ditch running along the western site boundary was deeper and wider than most of the other ditches and was considered to hold water permanently. Two of the other ditches held running water which flowed east-west towards lower land beyond the western site boundary, eventually into a former opencast workings to the west of the site.

5.2.29 The ditches have the potential to support a range of protected species and species of conservation concern.

### 5.3 Protected Species and Species of Conservation Concern

#### *Badgers*

5.3.1 The data search revealed several records of badger setts in the local area. A total of four badger setts were discovered within or adjacent to the site as well as field signs such as latrines, snuffle holes, hairs and mammal paths.

5.3.2 The location of setts are provided in Figure 3, and each sett is described within Table 3.

5.3.3 The arable fields, grassland and woodland habitats within the site are likely to represent key foraging grounds for local group(s) of badgers present.

#### *Bats*

5.3.4 The data search revealed a number of existing records of at least six species of bat from the surrounding 2km.

5.3.5 Four trees at the site were identified as having potential to support roosting bats. These were generally mature oak trees which either had 'Low' or 'Moderate' potential (Target Note 2 and 5 respectively) to support roosting bats, in accordance with the Bat Conservation Trust Guidelines<sup>15</sup>. These are all expected to be retained within the development. The woodland, hedgerow and scrub habitat is likely to be used by local populations of bats for foraging and commuting. The large expanses of agricultural fields are generally sub-optimal for foraging and commuting however.

5.3.6 Further surveys for foraging/commuting bats have been undertaken at the site, the results of which are given in a separate Appendix (Appendix 7.4)

#### *Otter*

5.3.7 The data search did not reveal any recent (post-2000) records of otter within 2km. The ditches on site are unlikely to be used by otters if present in the locality, being either dry or holding shallow water, which would not provide the sources of prey needed to sustain a population of this species at the site. It is considered that otters are highly unlikely to occur at the site.

#### *Water Vole*

5.3.8 The data search returned 7 records of water vole from within 2km, the most recent of which was from 2013. The ditches and ponds within the western part of the site have potential to be used by water voles, with suitable foraging and burrowing habitat present, although the fact that most of the ditches appear to dry regularly reduces the value of the site somewhat for water voles, as they generally favour features

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<sup>15</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



which hold water permanently. See Section 8 for further details of the findings of the detailed water vole survey.

#### *Amphibians*

- 5.3.9 Water samples were collected from the all five ponds at the site on 23<sup>rd</sup> April 2018 and sent for testing for great crested newt eDNA. The samples collected from P3, P4 and P5 returned a negative result indicating the likely absence of great crested newts from this pond. Water samples from two of the Ponds (P1 & P2) returned 'Indeterminate' results, which means that although no newt eDNA was identified, the water samples were of insufficient quality to ensure an accurate analysis. Water samples were re-collected from both of these ponds on 19<sup>th</sup> June 2018 and tested again, and returned negative results for great crested newt eDNA.
- 5.3.10 Details of the eDNA analysis are provided in Section 6. The results of the eDNA survey indicate that great crested newts are likely absent from the site.
- 5.3.11 The ponds provides suitable breeding and foraging habitat for more widespread species of amphibian, such as common frog *Rana temporaria* and common toad *Bufo bufo* which are expected to be use the features for present at the site. The field boundaries also provide suitable sheltering habitat for these species.

#### *Reptiles*

- 5.3.12 No recent records of reptiles within the locality of the site were revealed by the data search.
- 5.3.13 Nevertheless, the hedgerows, scrub, woodland edges, ditches and grassland areas offer some value for foraging and sheltering widespread reptile species, such as slow worm *Anguis fragilis* and grass snake *Natrix helvetica*. However, the large agricultural fields were considered to offer poor suitability for reptiles.

#### *Birds*

- 5.3.14 The site was considered to be suitable for both wintering and breeding birds, some of which may be notable species. Further surveys have been carried out, the results of which are given in separate Appendices (7.2 & 7.3).

#### *Invertebrates*

- 5.3.15 The data search revealed a number of existing records of notable butterfly and moth species from within the surrounding 2km.
- 5.3.16 Habitats at the margins and boundaries of the field are likely to be of value for a range of invertebrate species typical of woodland edge and hedgerows. During the surveys, several common and widespread species belonging to the order Lepidoptera were recorded, including cinnabar moth *Tyria jacobaeae*, a Species of Principal Importance. The ponds and ditches on site are also likely to support a range of aquatic invertebrates. However, assemblages of invertebrates supported by the arable field comprising the majority of the site are likely to be poor, particularly for pollinating species.

#### *Other Protected Species, Species of Conservation Concern and Invasive Species*

- 5.3.17 A number of brown hares *Lepus europaeus* (up to 8 individuals) were seen on regular occasions during the survey visits, particularly in the western part of the site (Target Note 6). The mosaic of open fields,



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woodland and hedgerow provides optimal habitat for this species. Brown hare is a Species of Principle Importance targeted for conservation nationally.

5.3.18 No Japanese knotweed or Himalayan balsam was noted within the site during the survey.

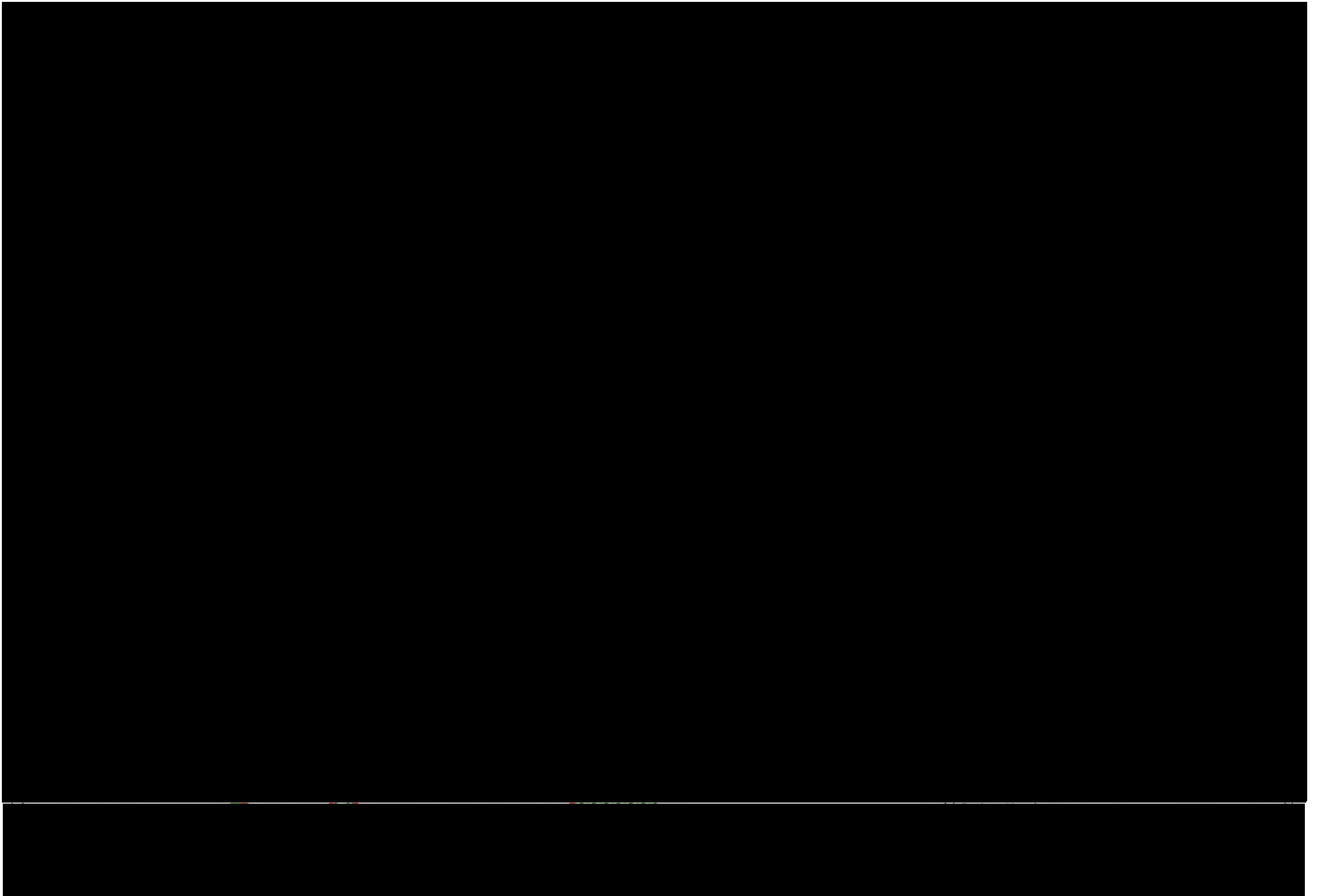


Figure 3: Extended Phase 1 Habitat Map



Table 3: Target Notes

No.	Description
TN1	Shallow valley area sloping down to a small stream. Covered with tall ruderal species with scattered young willow, hawthorn and bramble scrub
TN2	Mature oak tree with small number of Potential Roost Features (PRFs) such as loose, peeling bark, vertical frost cracks, rot holes and woodpecker holes. Considered to hold Moderate Potential for roosting bats
TN3	Dilapidated brick structure within dense hawthorn scrub
TN4	Mosaic of scrub, tall ruderals and poor SI grassland with farm track running through the middle. Occasional semi-mature ash tree scattered amongst scrub.
TN5	Mature oak tree with no obvious PRFs seen from the ground, but is of an age and size that PRFs may be present further up. Considered to hold Low Potential for roosting bats
TN6	Brown hares seen frequently
TN9	Brick structure in disrepair within scrub area.
TN11	Raised circular mound approximately 2m tall. Vegetated by coarse grasses and ruderal/herbaceous species, including false oat grass, cock's foot, hogweed, autumn hawkbit <i>Leontodon autumnalis</i> , creeping thistle and ragwort
TN13	Raised bund reaching approximately 15m tall in far south west corner of the site. Vegetated with a mix of dense bramble scrub, coarse grasses and ruderal species.
TN15	Area in north edge of Field F11 around the edge of circular mound (TN11) containing frequent northern marsh orchid, and occasional bee orchid.
TN16	Poultry Farm
TN17	Fenced area of bare ground at a former oil well, used for storing hay bales at the time of survey, Several self-seeded sycamore, ash and blackthorn trees scattered around the edges



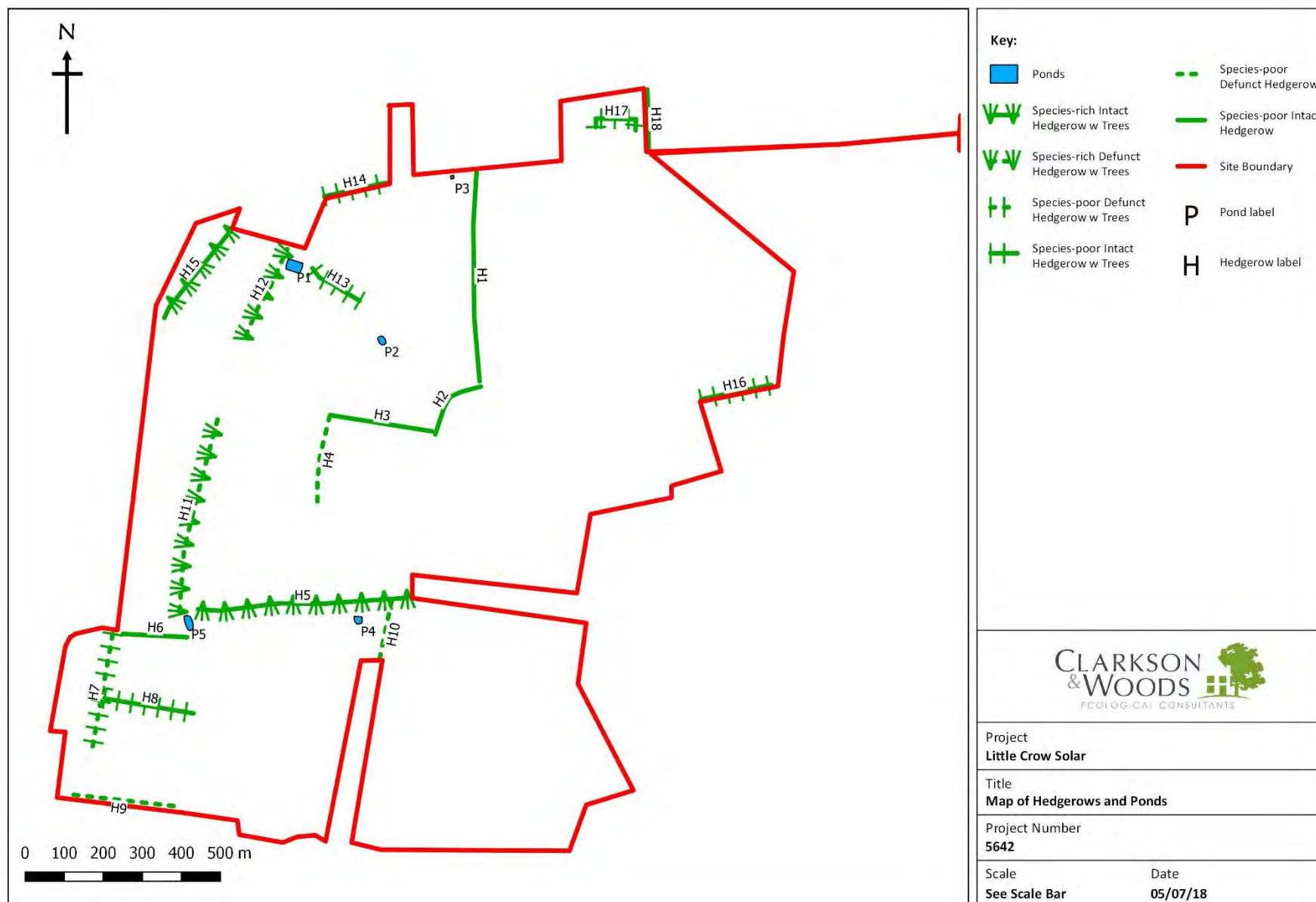


Figure 4: Map of Hedgerows and Ponds within Survey Area





Table 4: Descriptions of Hedgerows

Hedgerow No.	Description
H1	This hedgerow was approximately 525m in length and consisted primarily of hawthorn <i>Crataegus monogyna</i> , with occasional elder <i>Sambucus nigra</i> and sycamore <i>Acer pseudoplatanus</i> . The hedgerow was approximately 2m tall on top of an earth bank, with no sign of recent management. Frequent gaps were noted although no gaps measured more than 5m in length. This hedgerow was species-poor. Ground flora present included nettle, hogweed, red campion, bramble and burdock.
H2	A line of unmanaged shrub, approximately 3-6m tall and between 1 and 5m wide, with the wider and taller shrubs at the southern end. Dominated by hawthorn, with elder and ash also present and considered to be species-poor. Approximately 180m in length, partially forming a 'green lane' with scrub on the opposite side of a farm track. Ground flora present included white campion, red campion, mugwort, common poppy, nettle, red dead nettle, white dead nettle, field bindweed <i>Convolvulus arvensis</i> and hedge woundwort <i>Stachys sylvatica</i> .
H3	A species-poor, intact hedgerow measuring 250m in length showing no sign of recent management, and as a result was quite leggy as opposed to showing bushy, lateral growth. Up to 3m in height and 1.5m wide, dominated by hawthorn with occasional elder and white bryony <i>Bryonia alba</i> present. Ground flora included nettle, marsh thistle, hogweed and cow parsley.
H4	A 240m length of gappy, defunct hedgerow approximately 3m tall with no recent management evident. Species-poor, consisting of hawthorn, blackthorn, hazel and white bryony. A dry, shallow ditch (<0.5m deep and wide) was present at the base of the hedgerow on its eastern side, which was choked with mugwort and nettles. A deeper ditch was present on the western side, which looks to hold water. Ground flora included nettle, mugwort, hogweed, cleavers, soft brome and bracken.
H5	A largely intact, species-rich hedgerow, 530m in length and approximately 4-5m tall with taller standards. No sign of recent management. Species present included hawthorn, blackthorn, hazel, elder, oak, ash, willow, sycamore, and wild privet <i>Ligustrum vulgare</i> . Ground flora included hogweed, great willowherb, bramble, meadowsweet, mugwort and nettle.
H6	A hedgerow measuring approximately 175m in length, and 4-5m in height. Leggy, with no sign of recent management, with some small gaps although no gaps wider than 5m. A stream was present along the northern base. Dominated by hawthorn, with elder, bramble and willow.
H7	A 4m tall, species poor unmanaged hedgerow with taller oak and ash standards. Frequent gaps present. Species present included hawthorn, elder, bramble and white bryony. A ditch with common reed, nettles and hogweed was present along the base.
H8	Approximately 200m long running east-west. This is approximately 4m tall with one tall oak standard. Species present included hawthorn, elder, grey willow and white bryony. A dry ditch is present at the base of the hedgerow.
H9	A length of species-poor hedgerow approximately 140m long at the south western site boundary. Comprising hawthorn, blackthorn, willow and elder with frequent gaps and no sign of recent management. Several self-seeded shrubs present and a ditch at the base of the hedgerow.
H10	A 3-4m tall, overgrown, unmanaged and gappy hedgerow, approximately 160m in length and merging into the woodland at its southern base. Comprising hawthorn, elder, sycamore and field maple. A species-poor hedgerow. Ground flora present included nettle, hogweed, red campion, bramble and burdock
H11	An approximately 500m long species-rich hedgerow, overgrown and unmanaged with frequent gaps. Approximately 4-5m tall with taller oak and ash standards. Species present included oak, ash, hawthorn, elder and hazel. A mostly dry ditch was present along the western base, vegetated with nettles and bramble. Ground flora included nettle, common poppy, white campion, hogweed, bramble and burdock
H12	A species-rich, unmanaged and gappy hedgerow. Approximately 4m tall with one taller oak standard. Consisted of hazel, oak, elder, hawthorn, dog rose, larch, cypress and white bryony. Connected to woodland at the northern and southern base. A dry ditch is present at the eastern base of the hedgerow. Ground flora included nettle, hogweed, bramble and burdock
H13	A 110m section of unmanaged, bushy hedgerow, dominated by 4m high hawthorn but also containing elder, hazel, and 4 taller poplar trees. A ditch fringed with tall ruderal species was present along the southern base of the hedgerow.
H14	A line of unmanaged, leggy trees and shrubs separated from the adjacent woodland to the north by a farm track. 5-15m tall, comprising ash, blackthorn and hawthorn.
H15	A tall line of species-rich trees either side of a ditch. Approximately 8-12m tall, comprising semi-mature alder <i>Alnus glutinosa</i> , grey willow, silver birch, sycamore, blackthorn, dog rose, and hawthorn,
H16	A row of planted sycamore around 10m tall, situated on top of an earth bank.




Hedgerow No.	Description
H17	Line of unmanaged sycamore trees reaching to 12 screening former oil well, surrounded by self-seeded young sycamore, ash and blackthorn scrub.
H18	A managed field boundary hedgerow topped at 1.5m. Dominated by hawthorn with occasional elder, blackthorn, ash and bramble. A farm track ran alongside the western edge of the hedgerow.. Ground flora present included nettle, hogweed, red campion, and burdock.

Table 5: Description of Ponds

Pond No.	Description	Photographs (where available)
P1	Moderately large (900m <sup>2</sup> ) pond in the north west of the site, surrounded by marginal and emergent vegetation such as reed mace <i>Typha latifolia</i> , rushes, water lily <i>Nymphaea</i> sp, fool's-water-cress <i>Apium nodiflorum</i> and willowherb. A large, overhanging weeping willow was present on the eastern bankside. Small fish were observed, as were mallard <i>Anas platyrhynchos</i> , moorhen <i>Gallinula chloropus</i> and mute swan <i>Cygnus olor</i> .	 <p>Photograph 8: Pond P1</p>
P2	Permanent pond in the north east of field F6, south of the existing farm track and surrounded by tilled arable land. A large overhanging horse chestnut tree on the northern bankside. Pond covered in duck weed <i>Lemna</i> sp and surrounded by willowherb and soft rush. Nesting moorhen present.	None Available
P3	A relatively small pond (approximately 25m <sup>2</sup> ) at the northern edge of the site. Surface covered in duckweed, and banksides shaded by overhanging ash tree, hawthorn and elder bushes. Lacking in aquatic or marginal vegetation, and quite with dead and decaying matter. Almost dry in July 2017.	 <p>Photograph 9: Pond P3</p>



Pond No.	Description	Photographs (where available)
P4	<p>An ephemeral field pond in the north east of field F14, surrounded by tilled arable land. Covered in rush species and tall ruderals with a hawthorn shrub on the north east bankside. Highly seasonal – the pond was dry in July 2017 although held shallow water (&lt;20cm deep) in April 2018.</p>	 <p>Photograph 10: Pond P4</p>
P5	<p>A pond with a shallow depression amongst an area of secondary woodland. Highly seasonal – this pond was dry in July 2017 but held shallow (~20cm deep) water in April 2018. Completely overshadowed by surrounding woodland and lacking in aquatic vegetation. Heavily silted with dead leaves.</p>	<p>None Available</p>



## 7 ARABLE PLANTS SURVEY

7.1.1 Table 6 below provides a summary description of the habit within each of the arable plant survey target zones, shown in Figure 5. Table 7 demonstrates the relative abundance of plant species (excluding crops) in each zone using the DAFOR criteria.

Table 6: General Description of Arable Plants Survey Target Zones

Arable Plant Zone	General description
Zone AW1	Dead maize uncropped from last year. 60 – 120cm high in rows. Sparsely vegetated by crop, in typical rows. A very sandy soil.
Zone AW2	Dense oil seed rape 70cm. A thin 2-5m band of weed species, dominated by common poppy.
Zone AW3	Dense oil seed rape 70cm. A thin 2-5m band of weed species, dominated by common poppy.
Zone AW4	Dense oil seed rape 70cm. A 4-6m band of weed species, dominated by common poppy.
Zone AW5	Dense oil seed rape 70cm. Both the West and East sides of track. Dominated by borage.. Further less-dense patches of borage spreading to the west.
Zone AW6	Dense oil seed rape 70cm. A thin 2-5m band of weed species, dominated by borage.
Zone AW7	Dense oil seed rape 70cm. A thin 2-5m band of weed species, dominated by common poppy.

Table 7: Relative Abundance (DAFOR\*) of Arable Plant Species in Each Target Zone

Common Name	Latin Name	Zone AW1	Zone AW2	Zone AW3	Zone AW4	Zone AW5	Zone AW6	Zone AW7
Common poppy	<i>Papaver rhoeas</i>		D	A	O	O	F	
Fool's parsley	<i>Aethusa cynapium</i>		O	O		R	O	
Borage	<i>Borago officinalis</i>			R		D	O	
Black grass	<i>Alopecurus myosuroides</i>			R		D	A	
Bugloss	<i>Anchusa officinalis</i>		F	A		R	R	
White campion	<i>Silene latifolia</i>	O	O	R	O		R	O
Stinging nettle	<i>Urtica dioica</i>			R	R		R	
Scentless mayweed	<i>Tripleurospermum inodorum</i>		R					R
Goats-beard	<i>Tragopogon pratensis</i>		R		R			
Wall barley	<i>Hordeum murinum</i>		F					
Wild pansy	<i>Viola tricolor</i>		R	A	O			
Cut-leaved geranium	<i>Geranium dissectum</i>	R	F					
Rayless mayweed	<i>Matricaria matricarioides</i>		O	O	R			R
Shepherd's-purse	<i>Capsella bursa-pastoris</i>		O				O	R
Fat hen	<i>Chenopodium album</i>		R		O		R	R
Henbane	<i>Hyoscyamus niger</i>	O						



Groundsel	<i>Senecio vulgaris</i>	O						R
Vipers bugloss (margin only)	<i>Echium vulgare</i>	R						
Wild mignonette	<i>Reseda lutea</i>	O						
Prickly sow-thistle	<i>Sonchus asper</i>	R						
Creeping thistle	<i>Cirsium arvense</i>	R						
Toad rush	<i>Juncus bufonius</i>	R						
Annual nettle	<i>Urtica urens</i>	O			R			R

\*DAFOR scale = D – Dominant, A – Abundant, F – Frequent, O – Occasional, R – Rare

## 7.2 Important Arable Plant Area Assessment

- 7.2.1 Of the above arable plant species recorded only two species are listed by plantlife in the Important Plant Areas guide. These are Henbane which is recorded as being Threatened (and therefore a score of 7) and Wild Pansy which is recorded as being Near Threatened (and therefore a score of 6). None of the other species recorded on site are included within the plantlife listing which is drawn up from PLANTATT: Attributes of British and Irish Plants<sup>16</sup>.
- 7.2.2 This gives a total score for the overall site of 13. The provisional criteria for threshold scores for assessing the conservation importance of arable plant sites indicates that for sands and freely draining acidic soils, such as are found on site the threshold, is 20-34 points for a site of County Importance; 35-69 points for a site of National Importance and 70+ for a site of European importance. Therefore based upon this scoring method the site should not be considered of County importance or above. The threshold scores defined by Plantlife do not ascribe scores for levels of importance below County.
- 7.2.3 Nevertheless, the presence of one nationally threatened species and one near threatened species means the site does support some important arable weed species and therefore should be treated as important within the impact assessment.

<sup>16</sup> Hill, M.O., Preston, C.D. & Roy, D.B. (2004). PLANTATT: Attributes of British and Irish Plants. NERC Centre for Ecology and Hydrology, Monks Wood



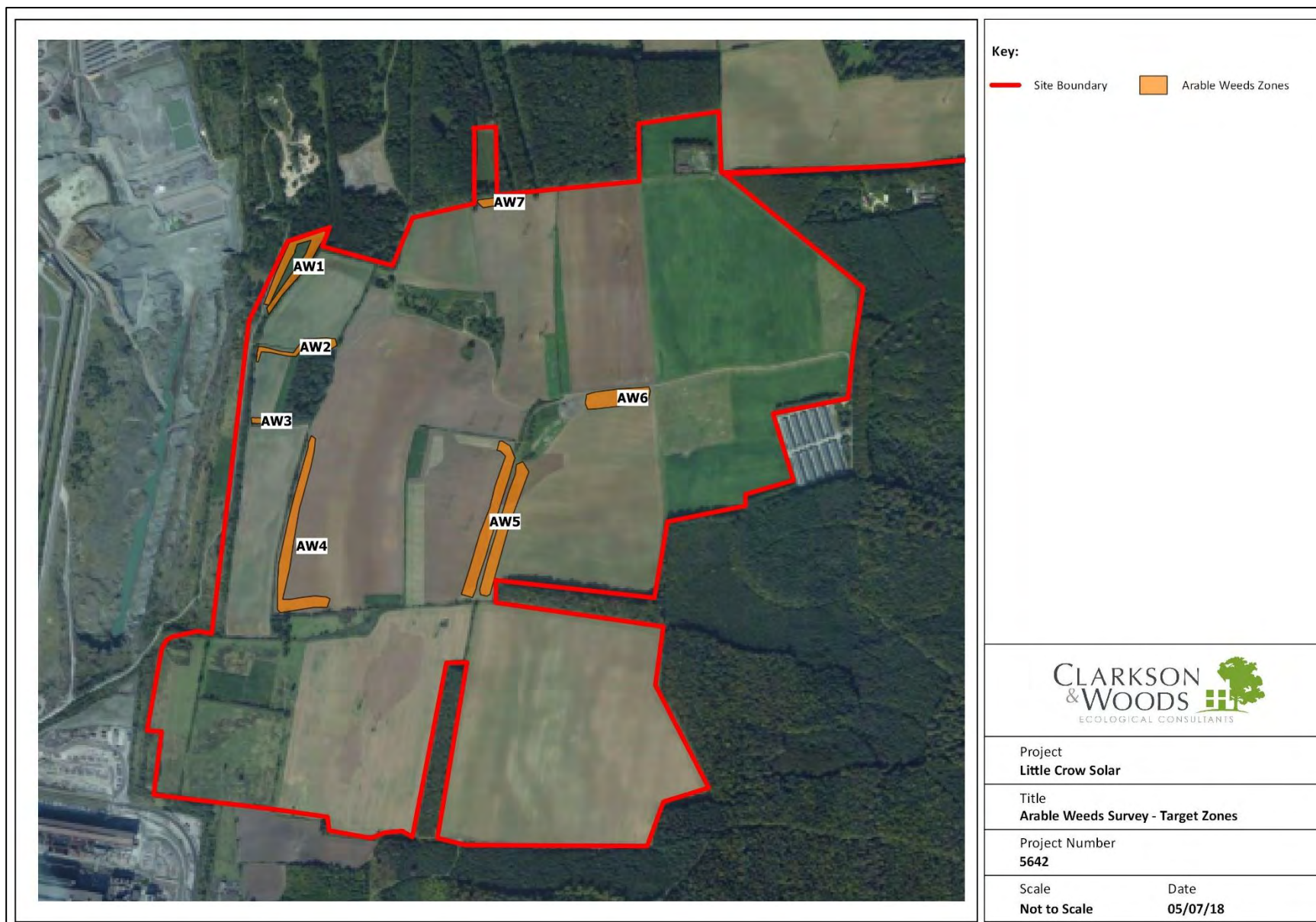


Figure 5: Arable Plants Target Survey Zones





## 8 GREAT CRESTED NEWT SURVEY

### 8.1 Habitat Suitability Index

#### 8.1.1 The calculation for HSI scores for each Pond is provided in Table 8:

Table 8: HSI Scoring Calculations for Each Pond

Habitat Suitability Index Criteria (for full details, see Oldham et al. 2000)	Score				
	P1	P2	P3	P4	P5
1. Location (Zone A, 1; Zone B, 0.5; Zone C, 0.01)	1	1	1	1	1
2. Pond Area (Estimated, and score extrapolated from graph)	0.95	0.5	0.1	0.25	0.6
3. Pond Drying (Never, 0.9; Rarely, 1.0; Sometimes, 0.5; Annually, 0.1;	0.9	1	0.5	0.1	0.1
4. Water Quality (Good, 1.0; Moderate, 0.67; Poor, 0.33; Bad, 0.01)	0.67	0.33	0.33	0.33	0.33
5. Shading (Estimated % perimeter shaded, score extrapolated from Graph)	1	0.8	0.4	1	0.2
6. Fowl (Absent, 1; Minor 0.67, Major 0.01)	0.67	0.67	1	1	1
7. Fish (Absent, 1; Possible 0.67, Minor 0.33, Major 0.01)	0.33	1	1	1	1
8. Ponds Number of ponds within 1km score extrapolated from Graph	0.8	0.8	0.75	0.75	0.75
9. Terrestrial Habitat (Good, 1; Moderate, 0.67; Poor, 0.33; None, 0.01)	1	0.33	0.67	0.33	0.67
10. Macrophytes (Estimated % of pond with macrophytes,) score extrapolated from Graph	0.6	0.8	0.5	0.3	0.6
Totals (S1xS2xS3xS4xS5xS6xS7xS8xS9xS10)1/10	0.76	0.67	0.53	0.48	0.51
Categorisation of HSI Score	Good	Average	Below Average	Poor	Below Average



## 8.2 eDNA Survey Results

8.2.1 The results of the eDNA Analysis lab report for the water samples taken from the ponds on 23<sup>rd</sup> April 2018 are replicated in Table 9 below:

Table 9: Lab Report for pond samples collected on 23/04/18 and Analysed by ADAS UK.

Pond Number	Sample Ref.	Determinant	Result	Method	Date of Analysis
P1	2018-0728	Inhibition Control	2 of 2	Real Time PCR	08/05/18
		Degradation Control	Evidence of degradation or residual inhibition		
		Great Crested Newt	Indeterminate		
		Negative PCR Control (Nuclease Free Water)	0 of 4		
		Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL)	4 of 4		
P2	2018-0730	Inhibition Control	2 of 2	Real Time PCR	08/05/18
		Degradation Control	Evidence of degradation or residual inhibition		
		Great Crested Newt	Indeterminate		
		Negative PCR Control (Nuclease Free Water)	0 of 4		
		Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL)	4 of 4		
P3	2018-0729	Inhibition Control	2 of 2	Real Time PCR	15/05/18
		Degradation Control	Within Limits		
		Great Crested Newt	0 of 12 (GCN Negative)		
		Negative PCR Control (Nuclease Free Water)	0 of 4		
		Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL)	4 of 4		
P4	2018-0189	Inhibition Control	0 of 2	Real Time PCR	08/05/18
		Degradation Control	Within Limits		
		Great Crested Newt	0 of 12 (GCN Negative)		
		Negative PCR Control (Nuclease Free Water)	0 of 4		
		Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL)	4 of 4		
P5	2018-0727	Inhibition Control	2 of 2	Real Time PCR	03/05/18
		Degradation Control	Within Limits		
		Great Crested Newt	0 of 12 (GCN Negative)		
		Negative PCR Control (Nuclease Free Water)	0 of 4		
		Positive PCR Control (GCN DNA 10 <sup>-4</sup> ng/μL)	4 of 4		



8.2.2 As Indeterminate results were obtained for Ponds P1 and P2 these were subsequently re-tested, with samples collected on 19<sup>th</sup> June 2018. The lab results are replicated in Table 10.

Table 10: Lab Report for pond samples collected on 19/06/18 and Analysed by SureScreen Scientifics.

Pond Location (Grid Ref.)	Sample Ref.	Sample Integrity Check	Degradation Check	Inhibition Check	GCN Detection	Positive Replicates
P1	2880	Pass	Pass	Pass	Negative	0
P2	2881	Pass	Pass	Pass	Negative	0



## 9 WATER VOLE SURVEY

9.1.1 Table 11 below provides a summary description of each of the ditches subject to a detailed water vole survey, together with an overview of the findings. A map showing the location of ditches surveyed is provide in Figure 6.

Table 11: General Description and Findings of Water Vole Survey

Ditch No.	General Description & Findings
Ditch 1	A 4m wide ditch overshadowed by tall trees on either bank. Holding shallow (<0.5m deep) standing water. With shallow earth banks, partly covered with dense bramble scrub in areas. Several rat droppings present, as well as a small number of mammal burrows which were attributed to rats. No water voles signs found.
Ditch 2	A stream at the base of a steep, wooded valley. Channel 1-2m wide, holding fast flowing water (<0.5m deep) flowing north-south. Completely overshadowed be woodland trees, with very little emergent/marginal vegetation.  A small number of rat droppings and mammal burrows (attributed to rats) were scattered along both banksides. A mustelid scat consisted with weasel <i>Mustela nivalis</i> was noted on a log half way along the stream. No water voles signs found.
Ditch 3	A watercourse comprising a shallow, wet flush at the eastern end which is 0.5m wide and holds shallow (<0.1m) water flowing east-west. The watercourse then enters a wooded area, where the banks and channel become deeper and steeper towards the western end, where the stream flows into Ditch 2. The eastern part is relatively open with tall ruderals and scattered scrub along the banks, with the western part being overshadowed by the tall woodland and hedgerow adjacent.  A number of rat droppings and burrows were noted, which were concentrated at the western end of the ditch. No water voles signs found.
Ditch 4	A dry ditch with shallow banksides (1m deep) and narrow channel (<1m wide), vegetated with trees, shrubs and tall ruderals.  A small number of rat droppings and prints were noted at the northern end of the ditch. No water voles signs found.
Ditch 5	A dry ditch at the connected to Ditch 4 at its western end. With shallow banksides (1m deep) and narrow channel (<1m wide), vegetated with trees, shrubs and tall ruderals. Overshaded by adjacent vegetation. No water voles signs found.
Ditch 6	A predominantly dry ditch, although some small pools of water occasionally present. Approximately 1m wide with steep banksides 0.5m – 1m deep. Banksides vegetated with trees, shrubs, ruderals and grasses.  Rats seen, and rat droppings, burrows and prints noted along the ditch. No water voles signs found.
Ditch 7	The northern section of this ditch comprised a shallow (<0.5m deep), 0.5m wide dry ditch on the eastern side of a hedgerow. The ditch was choked with ruderal vegetation. At the southern end, the ditch lay on the western side of the hedgerows and was deeper (1.5m deep) holding shallow (<5cm deep) water.  Rats seen, and rat droppings noted on a foot crossing spanning the ditch. No water voles signs found.
onDitch 8	A dry ditch approximately 1m wide with 2m deep, steep banks. Banksides covered in grasses, with the channel habitat choked by bramble and nettle.  No evidence of mammals noted.
Ditch 9	A 1m wide ditch with moderately steep, 2m deep banksides. Vegetated with dense ruderals and stands of bramble. A small number of rat droppings were noted, although much of this ditch was inaccessible. No water voles signs found.
Ditch 10	A 1m wide ditch along the woodland edge, with 2m deep, steep banks. Holding shallow (<10cm deep) water flowing east to west. Largely overshadowed by adjacent woodland within very little bankside or in-channel vegetation. A number of rat droppings, burrows and prints were recorded along the length of the ditch. No water voles signs found.
Ditch 11	A watercourse with 1.5m deep shallow banks, 2m wide. Holdings shallow water (~5cm deep) flower quickly east to west. Southern bankside vegetated with tall ruderals, with a hedgerow present along the northern banks. Some submerged weed present (fool's-water-



	cross). A small number of rat and fox <i>Vulpes vulpes</i> prints present at the southern end, with occasional rat burrows noted along the northern bankside. No water voles signs found.
--	---

- 9.1.2 No field signs evidencing the presence of water voles were noted during the surveys. A high density of rat fields signs were noted within the ditch network. Overall, given the absence of evidence encountered during detailed surveys undertaken for water voles, it is considered that this species are likely to be absent from the site.

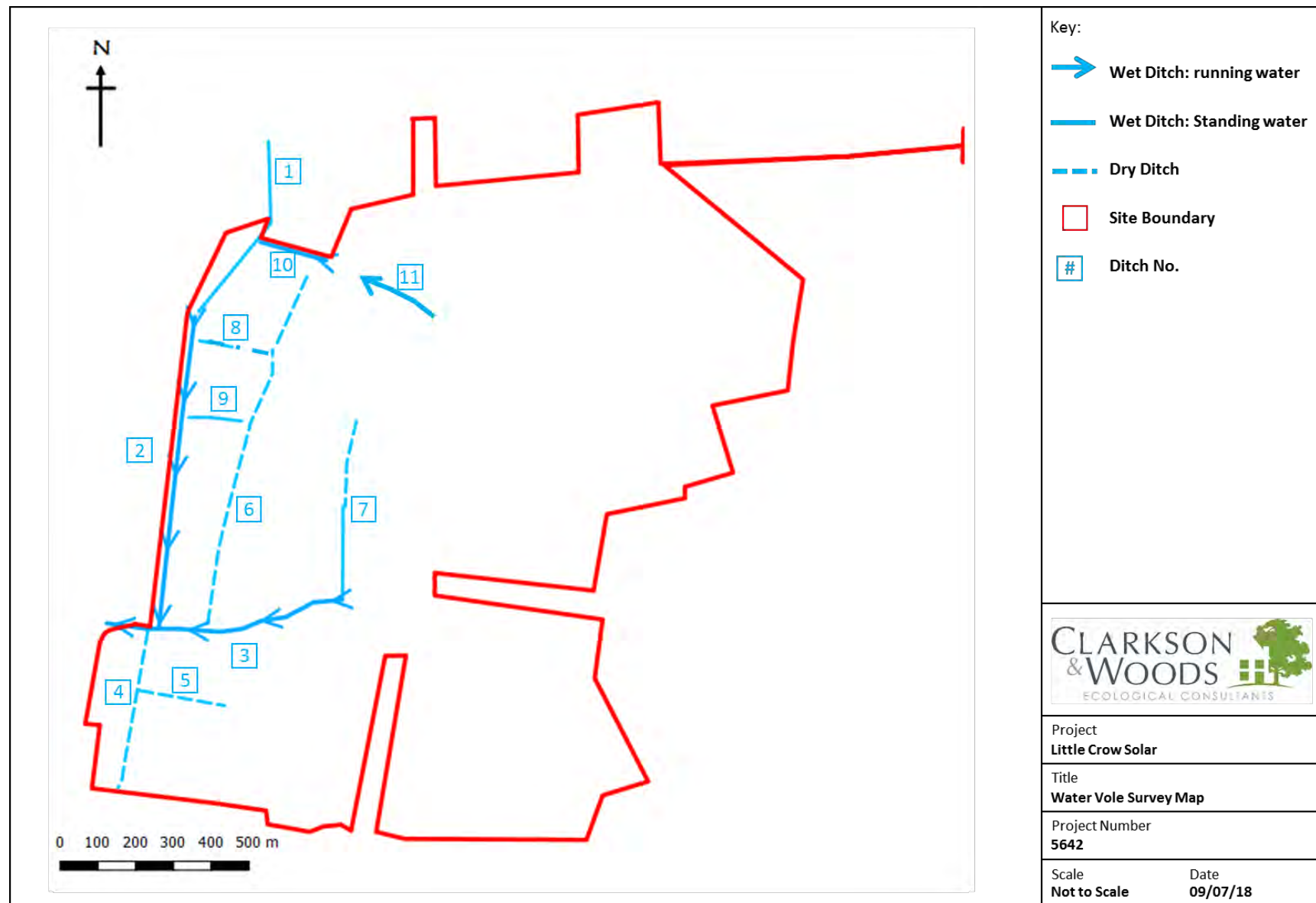


Figure 6: Map of Ditches Subject to Detailed Survey for Water Voles



## 10 SUMMARY

### 10.1.1 The survey revealed a mosaic of habitats within the site:

- Arable
- Semi-improved grassland
- Poor semi-improved grassland
- Improved grassland
- Plantation woodland – broadleaved, coniferous and mixed
- Semi-natural broadleaved woodland
- Hedgerows
- Tall ruderal
- Scrub
- Ponds
- Ditches

### 10.1.2 Whilst many of the habitat types present are common within the local landscape, the site is generally considered to be of relatively moderate ecological importance due to the substantial area of land within the site which support a 'mosaic' of habitat types, as well as the site's connectivity to other features of ecological value in the wider landscape.

### 10.1.3 The presence of several notable species were also confirmed or assumed:

- Badger (confirmed)
- Bats (see separate report)
- Birds (see separate report)
- Reptiles (assumed)
- Common toad (assumed)
- Arable Plant species, most notably henbane (confirmed)

### 10.1.4 Detailed surveys for great crested newts and water voles have identified these species as likely to be absent from the site.



Clarkson and Woods Ltd.  
Overbrook Business Centre,  
Poolbridge Road, Blackford,  
Somerset BS28 4PA  
  
t: 01934 712500  
e: [info@clarksonwoods.co.uk](mailto:info@clarksonwoods.co.uk)  
  
[www.clarksonwoods.co.uk](http://www.clarksonwoods.co.uk)



## **APPENDIX 7.5**

### **WINTERING BIRDS SURVEY (CLARKSON & WOODS ECOLOGICAL CONSULTANTS, NOVEMBER 2018)**



# Little Crow

*Solar Park*

National significant infrastructure project in the Energy Sector

*Little Crow Solar Park, Scunthorpe*

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## **WINTERING BIRD SURVEY**



# WINTERING BIRD SURVEY

LITTLE CROW SOLAR FARM, SCUNTHORPE

carried out by



commissioned by

INRG SOLAR (LITTLE CROW) LTD

V2 NOVEMBER 2018



# WINTERING BIRD SURVEY

## LITTLE CROW SOLAR FARM, SCUNTHORPE

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Client	INRG Solar (Little Crow) Ltd			
Authors	Michael Hockey			
	Peter Timms			
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## 1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by INRG Solar (Little Crow) Ltd to carry out wintering bird surveys of land proposed to accommodate Little Crow Solar Farm in Scunthorpe. The surveys were carried out between November 2017 and February 2018 by experienced bird surveyors.
- 1.1.2 This report aims to inform a planning application for construction of a solar farm within the site. It details the methods and results of the surveys.
- 1.1.3 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

## 2 SITE DESCRIPTION

- 2.1.1 The site consisted of seventeen (predominantly arable) agricultural fields; with occasional patches of dense scrub, broadleaved woodland and five ponds. Hedgerows, ditches and woodland made up the site boundaries. The wider landscape is characterised by the industrial steelworkings to the west of the site, and further arable farmland and plantation woodland to the north and east. Beyond the woodland to the south lies a recently constructed solar array.
- 2.1.2 The development site is approximately 226 hectares (ha) in size, and the approximate centre of the site is at OS Grid Ref. SE 941099.
- 2.1.3 Figure 1 shows the present layout of habitats across the site according to the Phase 1 Habitats Survey carried out in 2017.
- 2.1.4 The proposals for the site consist of the installation of solar panels on metal frames, which are driven into the ground, and connected by underground cables to a cabin containing a transformer. This is then connected locally to the National Grid network.



Figure 1: Phase 1 Habitat Map of the Survey Area





### 3 SURVEY AND ASSESSMENT METHODOLOGY

#### 3.1 Data Search

3.1.1 Statutory designated sites relating to birds within proximity of the site were identified using the Natural England/DEFRA web-based MAGIC database ([www.MAGIC.gov.uk](http://www.MAGIC.gov.uk)).

3.1.2 Lincolnshire Environmental Records Centre (LERC) was consulted for records of wintering birds within 2km of the site. The records centre was also asked to provide details of locally designated sites within 1km of the site.

3.1.3 Ordnance Survey maps (1:25,000) and aerial images of the site were examined online ([bing.com/maps](http://bing.com/maps) and [maps.google.co.uk](http://maps.google.co.uk)).

#### 3.2 Field Methodology

3.2.1 The site was surveyed for wintering birds on four occasions between 23<sup>rd</sup> October 2017 and 11<sup>th</sup> February 2018 to identify species, numbers and locations of wintering birds on site (see Table 1 for dates and weather conditions). Due to the large size of the site, each survey visit was split over two days.

Table 1: Dates and weather conditions of the wintering bird surveys

Survey Number	Date	Description of weather: Precipitation; Cloud (Oktas); Wind (Beaufort Scale)	Temperature (°C)	Timings
1	23/11/2017	Dry, Cloud 2, Wind 6	4	08:30 – 14:30
	24/11/2017	Dry, Cloud 2, Wind 2	6	08:30 – 10:00
2	09/12/2017	Dry, Cloud 0, Wind 3	1	08:30 – 15:00
	10/12/2017	Light snow, Cloud 5, Wind 2	0	08:30 – 11:00
3	26/01/2018	Dry, Cloud 6, Wind 2	5	08:00 – 15:30
	27/01/2018	Mostly dry, Cloud 7, Wind 4	5	08:00 – 10:30
4	11/02/2018	Dry, Cloud 5, Wind 3	5	08:00 – 15:00
	12/02/2018	Light rain, Cloud 8, Wind 1	3	08:00 – 11:00

3.2.2 The surveys followed British Trust for Ornithology (BTO) guidelines, where the observer systematically walked through the site, ensuring that all points on site were visited to within 50m. The location and behaviour of all birds and flocks of birds seen was noted on large-scale survey maps which were later collated for interpretation. Standard BTO Common Birds Census symbology and species codes were used to create a survey map for each individual visit.



3.2.3 Peak counts for all wintering species for the site and across the various survey zones and boundaries were calculated.

#### *Personnel*

3.2.4 Surveys were undertaken by Harry Fox BSc MCIEEM and Steve Miller affiliate member of CIEEM. Harry and Steve are highly experienced bird surveyors able to identify all British species by sight and sound.

#### *Mapping*

3.2.5 The site was divided up into **eight survey "zones"** (comprising fields) and **twelve "boundaries"** (comprising hedgerows, scrub and ditches) according to similar habitat characteristics to assist in the interpretation of data (see Table 2 & Figure 2). **This separation of the site's** features allowed the relative usage of the site's habitats by notable species or numbers of species to be assessed. It should be noted that these zones and boundaries combine multiple fields and hedgerows and therefore the numbering differs from that used in the Phase 1 survey map.

Table 2: Zones and Boundaries numbering scheme

Zone No.	Description
1	Arable fields to the north-east of the site, sown with winter barley
2	Primarily arable fields sown with a block of improved grassland present
3	Arable field to the south-east of the site sown with early wheat
4	Arable field to the south of the site sown with early wheat
5	Primarily semi-improved grassland fields to the south-west of the site
6	Primarily arable fields to the west of the site sown with harvested oil seed rape
7	Arable field towards the centre of the site with harvested oil seed rape
8	Arable fields towards the north of the site with beet
Boundary No.	Description
B1	Mixed plantation woodland to the east of the site and poultry farm
B2	Mixed plantation woodland to the south-east of the site
B3	Broad-leaved plantation woodland towards the centre of the site
B4	Broad-leaved plantation woodland to the south of the site dividing zones 3 and 4
B5	Hedgerow, scrub and woodland habitat to the south of the site
B6	Riparian woodland, hedgerows and scrub to the west of the site



B7	Broad-leaved plantation woodland, as well as an arable field containing a portion of bare ground surrounded by trees, situated to the north of the site
B8	Broad-leaved plantation woodland and hedgerows dividing zones 6 and 7
B9	Dense scrub and hedgerow between zones 7 and 8
B10	Hedgerows and ditch in the centre of the site
B11	Hedgerow with ditch to the north of zone 4
B12	Hedgerows and ditches to the south-west of the site



Figure 2: Map showing Habitat/Boundary Zones



## 4 SURVEY LIMITATIONS

- 4.1.1 This survey involved four survey events and thus provided a series of 'snapshots' of bird activity recorded on the site. It takes no account of any species which might occur at other times of the day and on other days. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.
- 4.1.2 Nocturnal bird surveys were not undertaken and as such the activity on site of birds such as owls cannot be determined. In lieu of survey data, a judgement has been made based on the results of the data search and the presumed value of the habitats on site to such species.
- 4.1.3 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.

### *Site Compound Area*

- 4.1.4 The survey area did not encompass the entire field surrounding the former oil well in the north east of the site, which is expected to be used to house the temporary site compound during construction of the array. This field was added to the application scheme subsequent to the completion of the breeding bird surveys. The red line boundary was amended to include this area after the surveys had been completed. The use of this area by wintering birds was not fully investigated and it is possible that bird species (including those of conservation concern) using this area were not recorded. However the survey route did follow the southern boundary of this field and this area was included within survey boundary zone B7 (figure 2 refers). As such any moderate or larger flocks of wintering birds present would likely have been conspicuous and recorded, and the surveyors also noted any movement of birds within, into and out of this area. The findings of the survey (particularly the results recorded within B7) are therefore considered to depict a reasonably accurate reflection of the bird use of this area during the survey period.



## 5 RESULTS

### 5.1 Data Search – Designated Sites of Relevance to Birds

#### *International Designations within 10km of the Site*

*Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar Site*

5.1.1 The Humber Estuary is designated a Special Protection Area (SPA) and Ramsar site. The area encompassing the SPA is situated approximately 11km north of the site at the closest point, whilst the SAC and Ramsar site is located 9km west at the closest point. It primarily receives its designation for its estuarine habitats, which support a range of associated species including internationally important assemblages of wintering and migratory birds.

5.1.2 The application site is situated a considerable distance from the Humber Estuary, and contains markedly different habitats to the estuarine habitats cited within the relevant designations. In addition, the application site is highly unlikely to represent functionally linked habitat for the wildlife supported by the designated sites.

#### *National Designations within 5km of the Site*

5.1.3 No nationally designated sites pertaining to birds are located within 5km of the site.

#### *Local Designations within 1km of the Site*

5.1.4 No locally designated sites pertaining to birds are located within 1km of the site.

### 5.2 Data Search – Protected and Notable Species

#### *Data obtained from Lincolnshire Environmental Records Centre (LERC)*

5.2.1 The data search identified 65 notable bird species within 2km of the site since 2000 which winter in the UK (or are vagrants) and are considered relevant to this report. These species and their conservation designations are detailed in Section 8 at the end of this report. Additional records beyond the most recent record for each species have been excluded.

5.2.2 A number of birds within Appendix B were recorded within the site. This includes Lapland bunting *Calcaeus lapponicus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, brambling *Fringilla montifringilla*, tree sparrow *Passer montanus*, fieldfare *Turdus pilaris* and hobby *Falco subbuteo*.

5.2.3 Details of the legislation affecting those protected species which have been identified as occurring on the site from the wintering bird surveys, or potentially occurring on the site given their ecological requirements, are detailed in Appendix A.

#### *Data Search – Local Conservation Priorities*

5.2.4 Farmland birds as a group are identified as targets for conservation within the Lincolnshire Biodiversity Action Plan (BAP) 2011-2020 (3<sup>rd</sup> Edition). The species of bird listed within this group are:



- Grey partridge *Perdix perdix*
- Lapwing *Vanellus vanellus*
- Yellow wagtail *Motacilla flava*
- Skylark *Alauda arvensis*
- Corn bunting *Miliaria calandra*
- Linnet *Carduelis cannabina*
- Yellowhammer *Emberiza citronella*
- Reed bunting *Emberiza schoeniclus*
- Turtle dove *Streptopelia turtur*
- Bullfinch *Pyrrhula pyrrhula*
- Starling *Sturnus vulgaris*
- Tree sparrow *Passer montanus*
- Snipe *Gallinago gallinago*
- Curlew *Numenius arquata*
- Redshank *Tringa totanus*
- Barn owl *Tyto alba*

5.2.5 These species have been identified as local conservation priorities and therefore will be given appropriate additional weight within the ES Chapter.

## 5.1 Field Survey Results

5.1.1 The main habitats within the site that were utilised by the birds recorded are listed below (in order of importance to key species and the overall assemblage of birds):

- Arable fields;
- Hedgerows and woodand;
- Semi-improved grassland; and
- Ditches

5.1.2 In total, 51 bird species were recorded within the site during the survey visits. 24 of the 51 were species of conservation concern, comprising 12 'red listed' birds and 12 'amber listed' birds according to the British Trust for Ornithology's studies into population declines among British birds within the last 30 years<sup>1</sup>. Twelve of these were also Species of Principal Importance (SPI) under Section 41 of the NERC Act 2006 or Schedule 1 species of the Wildlife and Countryside Act 1981 and as such are capable of being material considerations within the planning process. The species recorded are shown in Tables 3 and 4 overleaf. The level of protection each species receives is denoted by styling which is explained in the Key below.

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<sup>1</sup> Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. Mark Eaton, Nicholas Aebischer, Andy Brown, Richard Hearn, Leigh Lock, Andy Musgrove, David Noble, David Stroud and Richard Gregory





*Key to Colours and symbols used in Tables 3 and 4 below*

Style	Denotation
	BTO Amber List – Bird Population Status Amber
	BTO Red List – Bird Population Status Red
Bold text	Listed under Section 41 of the NERC Act 2006 (Species of Principal Importance - SPIs) or UK Biodiversity Action Plan species
Underlined text	Listed on the Wildlife and Countryside Act 1981 Schedule 1 (receives protection from disturbance while nesting)
	Peak Count of survey for each species

- 5.1.3 The patterns of abundance and distribution of birds are discussed later in this section, with greatest detail given to Birds of Conservation Concern and SPIs.
- 5.1.4 Table 3 shows the numbers of each species encountered across all the survey visits with the peak count(s) of sightings highlighted. This enables patterns in changing abundance of each species to be observed over the course of the wintering period.
- 5.1.5 Table 4 shows the peak counts of each species recorded in each survey zone/ boundary. This allows the relative usage of each survey zone and habitat type to be inferred. The information in this table will be discussed in the next section for each notable species in turn.



Table 3: Results of the Wintering Bird Survey – Total Individuals of Each Species by Survey Visit

Common name	Species name	Visit			
		1	2	3	4
Pink-footed goose	<i>Anser brachyrhynchus</i>		35		
Mallard	<i>Anas platyrhynchos</i>			1	1
Red legged partridge	<i>Alectoris rufa</i>		15	17	7
Grey heron	<i>Ardea cinerea</i>		2	1	1
Buzzard	<i>Buteo buteo</i>	3	2	5	3
Kestrel	<i>Falco tinnunculus</i>	2	2	1	1
Sparrowhawk	<i>Accipiter nisus</i>	1	1	1	1
Moorhen	<i>Gallinula chloropus</i>				1
Lapwing	<i>Vanellus vanellus</i>	77	109		
Snipe	<i>Gallinago gallinago</i>	1	1		
Woodcock	<i>Scolopax rusticola</i>	1	1	2	
Herring gull	<i>Larus argentatus</i>		4	7	3
Common gull	<i>Larus canus</i>	6	2		
Great black-backed gull	<i>Larus marinus</i>		2		
Black headed gull	<i>Chroicocephalus ridibundus</i>			10	4
Woodpigeon	<i>Columba palumbus</i>		250		
Stock dove	<i>Columba oenas</i>	52			
Great spotted woodpecker	<i>Dendrocopos major</i>				1
Skylark	<i>Alauda arvensis</i>	69	159	77	158
Meadow pipit	<i>Anthus pratensis</i>	18	1	6	21
Pied wagtail	<i>Motacilla alba</i>	80	84		7
Dunnock	<i>Prunella modularis</i>	1	9	9	6
Robin	<i>Erithacus rubecula</i>	7	20	23	15
Blackbird	<i>Turdus merula</i>	13	34	44	33
Song thrush	<i>Turdus philomelos</i>	2	4		
Mistle thrush	<i>Turdus viscivorus</i>		3		1
Redwing	<i>Turdus iliacus</i>		17	6	13
Fieldfare	<i>Turdus pilaris</i>	2			
Whitethroat	<i>Sylvia communis</i>			1	
Goldcrest	<i>Regulus regulus</i>			2	
Wren	<i>Troglodytes troglodytes</i>	5	14	22	11
Great tit	<i>Parus major</i>	5	6	14	9
Blue tit	<i>Cyanistes caeruleus</i>	7	32	49	24
Long-tailed tit	<i>Aegithalos caudatus</i>			7	4
Coal tit	<i>Periparus ater</i>	1	1	2	
Carrion crow	<i>Corvus corone</i>	126	43		
Rook	<i>Corvus frugilques</i>	8			
Jackdaw	<i>Corvus monedula</i>	1	7		
Jay	<i>Garrulus glandarius</i>	1	10	8	5
Magpie	<i>Pica pica</i>	2	2	4	6



Common name	Species name	Visit			
		1	2	3	4
Raven	<i>Corvus corax</i>				2
Starling	<i>Sturnus vulgaris</i>	77	60		
House sparrow	<i>Passer domesticus</i>			5	
Brambling	<i>Fringilla montifringilla</i>			2	
Goldfinch	<i>Carduelis carduelis</i>	21	46	16	21
Chaffinch	<i>Fringilla coelebs</i>	21	48	60	84
Greenfinch	<i>Carduelis chloris</i>	7	12	5	8
Bullfinch	<i>Pyrrhula pyrrhula</i>	2	4	7	1
Linnet	<i>Linaria cannabina</i>	16	21	22	2
Reed bunting	<i>Emberiza schoeniclus</i>	1	1	9	5
Yellowhammer	<i>Emberiza citrinella</i>	15	5	8	8
Sum of Individuals		651	1071	454	467
Count of Species		32	38	32	32



Table 4: Results of the Wintering Bird Survey by Survey Zone (See Figure 3 for Map of Zones)

Common name	Peak counts for each species per zone								Peak counts for each species per boundary											
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Pink-footed goose		35																		
Mallard														1		1				
Red legged partridge		2		2	1	5		6			2		7	2	2		1	8	1	
Grey heron	1							2						1						
Buzzard	1	1		3	2	2	1	2						1						
Kestrel		1			1			2			1				1					
Sparrowhawk					1					1									1	1
Moorhen																1				
Lapwing		71		9			69													
Snipe	1				1															
Woodcock					1	1			2											
Herring gull			6				8													
Common gull			4	1	3															
Great black-backed gull		2																		
Black headed gull	3		8				1	3												
Woodpigeon											250									
Stock dove	50				1					1										
Great spotted woodpecker															1					
Skylark	121	51	3	3	10	1	12													
Meadow pipit	28	2	5	1	1	3	3	3												
Pied wagtail		8			1	76											4			
Dunnock			1	1	1	2		1	1			1	1	2		1	2	5	3	3
Robin	3		1		2	4		9	6	2	3	1	4	7	8	6		4	2	3
Blackbird	3			3	10	6		13	9	5	6	9	10	8	9	9	2	9	5	8



Common name	Peak counts for each species per zone								Peak counts for each species per boundary											
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Song thrush				1				1		1								1	1	1
Mistle thrush												1	1			1			1	
Redwing			6	4			3		3	3	1						1	6	9	
Fieldfare								2												
Whitethroat											1									
Goldcrest	1																		1	
Wren	1			1	4	1		3	5	4	4	3	3	5	2	5		5	5	1
Great tit	1			1				3	4	1	3	1	2	3	4	3	2	1	4	1
Blue tit	3				7	5		9	14	5	4	6	4	11	16	5	4	1	10	8
Long-tailed tit									4						3	4				
Coal tit									1	3										
Carrion crow	33	1	10	10	1		100	3		1				6		4				
Jackdaw	7						1													
Rook	8																			
Jay	1		3			1		1		6	3	1	5		1				2	
Magpie		3	1		2	1			1	1		1		3					1	
Raven	2																			
Starling	110	3					24													
House sparrow																		5		
Brambling																		2		
Goldfinch	6	21		2		13		5						26	5			21		5
Chaffinch		8		3	11	24	1	46	4		2		2	23	6	8	3	46	12	14
Greenfinch	9	6			2	1		7	1								1	2	3	
Bullfinch				1				2								1			7	3
Linnet	20				5		8	12									1	13	1	1



Common name	Peak counts for each species per zone								Peak counts for each species per boundary											
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Reed bunting					4	1		1			2			2		2		2		2
Yellowhammer	1			9				6									3	11	3	3
Count of Species	24	15	11	17	22	17	12	23	13	13	13	9	10	15	12	14	11	17	19	14



## 5.2 Red-listed species

### *Lapwing*

- 5.2.1 A typical bird of farmland and upland grassland during the winter, but now in severe decline due to habitat loss. These birds were observed twice in fairly large numbers during (peak count during a single visit of 109) within the open habitats of Zone 2 and Zone 7, during the first two visits in November and December. This species was however absent during the latter two visits in January and February. This species is probably present all year round in the surrounding landscape and the site is likely a regular component of the winter foraging habitat for the local population.

### *Skylark*

- 5.2.2 Skylark are a ground nesting bird, requiring open habitats to maintain long sightlines for predator surveillance. Skylark have suffered dramatic declines in their breeding population in Britain in recent decades: with a halving of numbers in the 1990s, predominantly due to changes in farming practices governing the timing of sowing and harvesting. The arable fields on site provided optimal habitat for these birds. Skylarks were not particularly associated with any of the boundaries.
- 5.2.3 Skylark numbers site peaked at 159 during the 2<sup>nd</sup> visit in December, although moderate to large numbers were encountered on each visit. These birds were mainly found foraging in Zone 1 - an arable field on the north-eastern side of the site which is also part of the highest-lying land on site with the widest sightlines and visibility. This field would appear to constitute a valuable foraging resource for this species.
- 5.2.4 In summary, the site comprised optimal habitat for foraging and sheltering skylark, especially that of Zone 1, which is likely to form an important winter foraging resource for this species. There was an abundance of other, similar habitat in the form of open arable land within the local area.

### *Redwing and Fieldfare*

- 5.2.5 Redwing and fieldfare are both winter visitors to the UK which have suffered from a decline in abundance of species-rich, and structurally diverse hedgerows and woodland for both shelter and foraging. As a result both species are a red listed.
- 5.2.6 Flocks of these species were observed in low numbers foraging on the ground and within the adjacent woodland areas. Peak numbers for redwing were 17, and these were associated with both open areas and boundary habitats. Sightings of fieldfare was limited to two individuals recorded during the first visit in November only, foraging within Zone 8.
- 5.2.7 Given the low numbers of both species on site, the site is unlikely to represent important winter foraging ground for redwing and fieldfare.

### *Starling*

- 5.2.8 The starling is a familiar species often found in towns, gardens, farmland and woodland. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering



population decline (1981-2010) and reduction in breeding and wintering range (1981-2010)<sup>6</sup>. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).

- 5.2.9 Starling were observed in moderately-sized flocks predominantly in Zone 1 and 7. Several flocks were observed on multiple occasions flying overhead. The site offers suitable habitat for foraging starling and appears to support modest numbers.

#### *Woodcock*

- 5.2.10 Woodcock are wading birds commonly associated with woodland which is used for cover. Most woodcock are winter visitors from eastern and northern Europe and rely on woodland, scrub and rough grassland for shelter during the day and pasture and arable fields for foraging at night. Woodcock are in decline, possibly due to the reduction in available breeding areas, such as open areas within woodlands. Small numbers (maximum 2 individuals) were encountered on three of the four survey visits. These were observed on site within the more sheltered fields of Zones 5 and 6, and within Boundary 1.

- 5.2.11 A small population of this species are probably present all year round in the woodland habitats surrounding the site, and the site is likely a component of the winter foraging habitat for low numbers of this species.

#### *Linnet*

- 5.2.12 The linnet is a species mainly associated with farmland and open country. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline (1981-2010) and reduction in breeding and wintering range (1981-2010)<sup>6</sup>. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).

- 5.2.13 Linnets were present on site during all four survey visits, with a maximum of 21 individuals recorded on site. This species will utilise open fields and hedgerows. The site offers suitable habitat for foraging linnet and appears to support a moderate population.

#### *Yellowhammer*

- 5.2.14 Yellowhammers are mainly associated with open countryside and hedgerows. This species is red listed as a Species of Conservation Concern due to recent population declines. This is likely due to changes in agricultural practices, such as the removal of hedgerows and increased use of pesticides. Yellowhammers were mainly observed within the Boundary habitats around the site, although small numbers were seen in more open areas, such as Zone 4 and Zone 8. The site offers suitable habitat for foraging yellowhammers and appears to support moderate numbers, with a peak count of 15 recorded during Visit 1.

#### *Pink-footed goose*

- 5.2.15 Pink-footed geese are found on coasts, wetlands, grassland and arable habitats over winter in the UK. They are amber listed as a Species of Conservation Concern due to recent breeding and wintering population decline (1981-2007), reduction in breeding and wintering range (1981-2010)<sup>6</sup> and for having an important non-breeding population. A moderate-sized flock of 35 was





observed on Visit 2 only in Zone 2. This species is likely to use the open fields for foraging but it appears that the site forms only a component of the foraging area for a local wintering population.

#### *Stock dove*

- 5.2.16 Stock dove are most characteristic of arable farmland. They are an amber-listed species of conservation concern due to recent breeding and wintering population decline and reduction in both breeding and wintering range. A moderate flock of 50 stock doves were recorded in Zone 1 during Visit 1 only. The site offers suitable habitat but appears not to be a critical wintering area for stock dove given their absence in December, January and February.

#### *Meadow pipit*

- 5.2.17 Like skylarks, meadow pipits are associated with open arable, grassland and heathland habitats and are ground dwelling birds and have undergone declines in recent years, hence their amber status.
- 5.2.18 Meadow pipit were observed during all survey visits although only as individuals or small loose flocks. These were present across the open habitats at the site. The site offers suitable habitat for foraging meadow pipit and appears to support a modest population.

#### *Dunnock*

- 5.2.19 Dunnock inhabit any well vegetated areas with scrub, brambles and hedges, including field edges, earning their moniker "hedge sparrow". They spend large amounts of time on the ground in amongst grassland but also remain close to shrubby vegetation cover. Dunnock abundance fell substantially between the mid-1970s and mid-1980s, after a period of population stability. Some recovery has occurred throughout the UK since the late 1990s. Dunnock is an amber listed Species of Conservation Concern and a Species of Principal Importance. Dunnock were observed widely across the site on all visits in low to modest numbers, with a peak count of 9 recorded on both the 2<sup>nd</sup> and 3<sup>rd</sup> visits. This species is unlikely to utilise the open fields for foraging but will use the field margins.

#### *Reed bunting*

- 5.2.20 The reed bunting is a species mainly associated with reedbeds, riverine scrub and marsh. This species is amber listed as a Species of Conservation Concern due to recent breeding and wintering population decline (1981-2007) and reduction in breeding and wintering range (1981-2010)<sup>6</sup>. It is also a Species of Principal Importance under section 41 of the NERC Act (2006). Reed bunting were observed during all visits with a peak of 9 individuals recorded on visit 3. They were observed in both open fields and boundaries and were mostly associated with the ditches to the west of the site. This species will utilise open fields but is more likely to use the hedgerow and ditch system. The site does offer suitable habitat for foraging reed bunting, however appears to support modest numbers only.



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*Other Birds of Conservation Concern*

- 5.2.21 Small numbers of bullfinch (peak count of 7), an amber listed species, were consistently recorded throughout the survey visits, and were most strongly associated with the field boundary habitats in the south west of the site.
- 5.2.22 Individuals or small numbers (maximum 10) of each of mistle thrush, song thrush, herring gull, house sparrow (red-listed species) and kestrel, mallard, common gull, greater blacked gull and snipe (amber-listed species), were recorded on one or two occasions and did not show a persistent association with the site. It is therefore likely that they are not present within the site throughout the winter but may use the site opportunistically.

*Other Birds*

- 5.2.23 Other birds recorded were primarily generalist species encountered within a range of habitats including hedgerow and woodland. These included tits, finches, wren, blackbird and various corvids such as jackdaw, carrion crow and magpie. There were also several other species which are more selective of riparian habitat such as moorhen and grey heron; and farmland species such as red legged partridge.



## 6 SUMMARY

- 6.1.1 A total of 55 species were identified; of which 12 were red listed birds and 12 were amber listed birds. Of these 24 bird species, 10 are also Species of Principal Importance under the NERC Act (2006) and so are a material consideration for planning.
- 6.1.2 The notable birds utilising the site can be split into two distinct categories; those which were recorded predominantly within open habitats and those recorded foraging predominantly in boundary habitats such as woodland and hedgerows.
- 6.1.3 The birds utilising the open field habitats are more likely to be directly impacted installation of a solar array. The peak count of numbers recorded at the site for each of these species is summarised in Table 5 below.

Table 5: Summary of Wintering Birds of Open Farmland

Birds Recorded within Open Habitats	Peak Count
Pink-footed goose	35
Lapwing	109
Herring Gull	7
Common gull	6
Great black-backed gull	2
Black-headed gull	10
Skylark	159
Meadow pipit	21

- 6.1.4 Table 6 summaries the notable bird species that predominantly use the boundary habitats for sheltering and foraging:

Table 6: Summary of Wintering Birds of Field Boundary Habitats

Birds Associated with Boundary Habitats	Peak Count
Mallard	1
Kestrel	2
Snipe	1
Woodcock	2
Stock dove	52
Dunnock	9
Song thrush	4
Mistle thrush	3
Redwing	17
Fieldfare	2
Starling	77
House sparrow	5
Bullfinch	7
Linnet	22
Reed bunting	9
Yellowhammer	15



## 7 WILDLIFE LEGISLATION & SPECIES INFORMATION

### BIRDS

All British birds, their nests and eggs (with certain exceptions) are protected under the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to: intentionally kill, injure or take a wild bird; intentionally take, damage or destroy nests which are in use or being built; intentionally take or destroy birds' eggs; or possess live or dead wild birds or eggs. A number of species receive additional protection through inclusion on Schedule 1 of the Wildlife and Countryside Act; for these it is also an offence to intentionally or recklessly disturb birds while nest building, or at a nest containing eggs or young, or to disturb the dependant young of such a bird. Penalties for offences against bird species include fines of up to £5,000 and/or up to six months in prison.

General licences for control of some bird species are issued by Natural England and Natural Resources Wales in order to prevent damage or disease, or to preserve public health or public safety, but it is not possible to obtain a licence for control of birds or removal of eggs/nests for development purposes. Consequently if nesting birds are present on a development site when works are programmed to start it is usually necessary to delay works, at least in the areas supporting nests, until any chicks have fledged and left the nest. It is usually possible, once chicks have hatched, for an experienced ecologist to predict approximately when they are likely to fledge, in order to inform programming of works on site.

### PLANNING POLICY IN RELATION TO BIODIVERSITY - ENGLAND

The National Planning Policy Framework (NPPF), issued in March 2012, has superseded Planning Policy Statement 9: Biodiversity and Geological Conservation (August 2005). Additional guidance can be found online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. Further guidance is also available within the Government Circular ODPM 06/2005 on Biodiversity and Geological conservation although it should be noted that this document is currently being updated by DEFRA. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 109), including:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 115):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 118) by applying principles including:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) **should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;**
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;



- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and
- the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

## ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

In England, the National Planning Policy Framework (NPPF), issued in March 2012, states that the planning system should contribute to "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures". It also states that "opportunities to incorporate biodiversity in and around developments should be encouraged".



## 8 LERC RECORDS OF BIRDS FROM SURROUNDING 2KM

Species Name	Common Name	Date	Abundance	Designations
Acanthis cabaret	Lesser Redpoll	04/03/2015	3 Present (Count: Exact)	BoCC4-Red, Sect.41, Sect.42,
Accipiter gentilis	Goshawk	06/12/2003	1 Present (Count: Exact)	WCA1i,
Alauda arvensis	Skylark	27/06/2015	4 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41
Alcedo atthis	Kingfisher	01/11/2015		BoCC4-Amber, WCA1i,
Anas acuta	Pintail	23/11/2011	3 Present (Count: Exact)	BoCC4-Amber, WCA1ii,
Anas penelope	Wigeon	08/03/2015	1 Total (Count: Exact)	BoCC4-Amber,
Anas strepera	Gadwall	01/01/2013		BoCC4-Amber,
Anser anser	Greylag Goose	23/05/2015	2 Total (Count: Exact)	BoCC4-Amber, WCA1ii
Anser brachyrhynchus	Pink-footed Goose	01/11/2015		BoCC4-Amber,
Anser fabalis subsp. fabalis	Taiga Bean Goose	16/03/2011	8 Present (Count: Exact)	BoCC4-Amber,
Anser fabalis subsp. rossicus	Tundra Bean Goose	23/11/2011-07/12/2011	2 Juvenile (Count: Exact)	BoCC4-Amber,
Aythya ferina	Pochard	13/12/2015	2 Total (Count: Exact)	BoCC4-Red,
Aythya marila	Scaup	23/11/2011	1 1st calendar year male(s) (Count: Exact)	BoCC4-Red, Sect.41, , WCA1i,
Bucephala clangula	Goldeneye	20/12/2000	2 Present (Count: Exact)	BD2.2, BoCC4-Amber, WCA1ii,
Calcarius lapponicus	Lapland Bunting	27/10/2001	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
Charadrius morinellus	Dotterel	25/04/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i,
Circus aeruginosus	Marsh Harrier	11/01/2012-22/02/2012	4 Present (Count: Exact)	BoCC4-Amber, WCA1i,
Clangula hyemalis	Long-tailed Duck	06/12/2004	1 Present (Count: Exact)	BoCC4-Red, WCA1i
Coccothraustes coccothraustes	Hawfinch	February 2009	11 Present (Count: Exact)	BoCC4-Red, Sect.41, Sect.42,
Cygnus columbianus subsp. bewickii	Bewick's Swan	15/02/2002	2 Present (Count: Exact)	BoCC4-Amber, Sect.41, Sect.42, WCA1i,
Cygnus cygnus	Whooper Swan	19/03/2013	26 Present (Count: Exact)	BoCC4-Amber, WCA1i,
Cygnus olor	Mute Swan	01/04/2014		BoCC4-Amber,
Emberiza calandra	Corn Bunting	2005 - 2010		BoCC4-Red, LBAP:3,
Emberiza citrinella	Yellowhammer	25/11/2015	9 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,
Emberiza schoeniclus	Reed Bunting	25/11/2015	2 Total (Count: Exact)	BoCC4-Amber, LBAP:3, Sect.41, Sect.42,
Falco columbarius	Merlin	28/03/2012	1 Female (Count: Exact)	BD1, Bern2, BoCC4-Red, , WCA1i,i



Species Name	Common Name	Date	Abundance	Designations
Falco peregrinus	Peregrine	03/11/2015	1 Present (Count: Exact)	BD1, Bern2, CITESA, CMS_A2, LBCSchedule1, ScotBL, WCA1i,
Falco subbuteo	Hobby	02/08/2015	1 Total (Count: Exact)	WCA1i
Fringilla montifringilla	Brambling	25/01/2015	23 Present (Count: Exact)	WCA1i
Gallinago gallinago	Snipe	06/12/2014	1 Present (Count: Exact)	BoCC4-Amber, LBAP:3
Gavia immer	Great Northern Diver	12/01/2013	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
Gavia stellata	Red-throated Diver	14/11/2011	1 Juvenile (Count: Exact)	WCA1i,
Haliaeetus albicilla	White-tailed Eagle	19/05/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i,
Linaria cannabina	Linnet	02/08/2015		BoCC4-Red, LBAP:3,
Loxia curvirostra	Common Crossbill	19/03/2014	22 Present (Count: Exact)	WCA1i,
Loxia leucoptera	Two-barred Crossbill	23/03/2014	1 Male (Count: Exact)	WCA1i
Lullula arborea	Woodlark	28/02/2014	1 Present (Count: Exact)	Sect.41, Sect.42, WCA1i
Melanitta nigra	Common Scoter	31/03/2005	1 Male (Count: Exact)	BoCC4-Red, Sect.41, Sect.42, , WCA1i,
Milvus milvus	Red Kite	19/10/2014	1 Present (Count: Exact)	WCA1i,
Numenius arquata	Curlew	2005 - 2010		BoCC4-Red, LBAP:3, , Sect.41, Sect.42,
Numenius phaeopus	Whimbrel	08/08/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i, WO1i
Passer domesticus	House Sparrow	25/11/2015		BoCC4-Red, LBAP:3, , Sect.41, Sect.42,
Passer montanus	Tree Sparrow	02/08/2015		BoCC4-Red, LBAP:3, Sect.41, Sect.42,
Perdix perdix	Grey Partridge	03/10/2015	5 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,
Pernis apivorus	Honey-buzzard	02/10/2015	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
Pyrrhula pyrrhula	Bullfinch	25/11/2015	1 Total (Count: Exact)	BoCC4-Amber, , LBAP:3,
Serinus serinus	Serín	17/11/2007	1 Present (Count: Exact)	WCA1i
Stercorarius parasiticus	Arctic Skua	07/05/2002	1 Present (Count: Exact)	BoCC4-Red, , UKBAP
Sturnus vulgaris	Starling	25/11/2015	100 Total (Count: Estimate)	BoCC4-Red, LBAP:3
Tringa glareola	Wood Sandpiper	28/08/2002	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
Tringa ochropus	Green Sandpiper	20/06/2014	1 Present (Count: Exact)	BoCC4-Amber, WCA1i





Species Name	Common Name	Date	Abundance	Designations
Tringa totanus	Redshank	19/04/2011	4 Present (Count: Exact)	BoCC4-Amber, LBAP:3
Turdus iliacus	Redwing	06/12/2015	6 Present (Count: Exact)	BoCC4-Red, , WCA1i
Turdus philomelos	Song Thrush	15/06/2015	1 Total (Count: Exact)	BoCC4-Red, LBAP:3,
Turdus pilaris	Fieldfare	26/03/2014	400 Present (Count: Exact)	BoCC4-Red, WCA1i,
Tyto alba	Barn Owl	24/12/2015	1 Present (Count: Exact)	LBAP:3, WCA1i,
Vanellus vanellus	Lapwing	04/10/2015	8 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,

Meaning of designations listed above

Designation	Meaning
BoCC4-Amber	BTO Amber List – Bird Population Status Amber
BoCC4-Red	BTO Red List – Bird Population Status Red
Sect.41/42	Section 41/42 of the NERC Act 2006/ UK Biodiversity Action Plan Species
WCA1i	Wildlife and Countryside Act 1981 Schedule 1
LBAP:3	Lincolnshire Biodiversity Action Plan (3 <sup>rd</sup> Edition)

Clarkson and Woods Ltd.  
Overbrook Business Centre,  
Poolbridge Road, Blackford,  
Somerset BS28 4PA

t: 01934 712500  
e: [info@clarksonwoods.co.uk](mailto:info@clarksonwoods.co.uk)

[www.clarksonwoods.co.uk](http://www.clarksonwoods.co.uk)



CLARKSON & WOODS

## **APPENDIX 7.6**

### **BREEDING BIRDS SURVEY (CLARKSON & WOODS ECOLOGICAL CONSULTANTS, NOVEMBER 2018)**



# Little Crow

*Solar Park*

National significant infrastructure project in the Energy Sector

*Little Crow Solar Park, Scunthorpe*

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## **BREEDING BIRDS SURVEYS**



BREEDING BIRD SURVEYS

LITTLE CROW SOLAR FARM, SCUNTHORPE

carried out by



commissioned by

INRG SOLAR (LITTLE CROW) LTD.

V3 NOVEMBER 2018



# BREEDING BIRD SURVEYS

## LITTLE CROW SOLAR FARM, SCUNTHORPE

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Project title	Little Crow Solar Farm, Scunthorpe			
Project number	5642			
Document title	Breeding Bird Surveys			
Client	INRG Solar (Little Crow) Ltd			
Author	Peter Timms			
Status	Checked by	Date	Approved for C&W by	Date
V1.0	Tom Clarkson	12/07/18	Peter Timms	12/07/18
V2.0 <i>Updated to include Results of 4<sup>th</sup> visit added</i>			Peter Timms	07/08/18
V3.0 <i>Updated to reflect red line boundary change</i>	Peter Timms	19/11/18	Harry Fox	20/11/18

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



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## 1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by INRG Solar to carry out breeding birds surveys of land proposed to accommodate Little Crow Solar Farm in Scunthorpe. The surveys were carried out between April and July 2018 by experienced bird surveyors.
- 1.1.2 This report aims to inform a planning application for construction of a solar farm within the site. It details the methods and results of the surveys and informs the Environmental Statement (ES) Chapter on Ecology prepared for the site.
- 1.1.3 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

## 2 SITE DESCRIPTION

- 2.1.1 The site consisted of seventeen (predominantly arable) agricultural fields; with occasional patches of dense scrub, broadleaved woodland and five ponds. Hedgerows, ditches and woodland made up the site boundaries. The wider landscape is characterised by the industrial steelworkings to the west of the site, and further arable farmland and plantation woodland to the north and east. Beyond the woodland to the south lies a recently constructed solar array.
- 2.1.2 The development site is approximately 226 hectares (ha) in size, and the approximate centre of the site is at OS Grid Ref. SE 941099.
- 2.1.3 Figure 1 shows the present layout of habitats across the site according to the Phase 1 Habitats Survey.
- 2.1.4 The proposals for the site consist of the installation of solar panels on metal frames, which are driven into the ground, and connected by underground cables to a cabin containing a transformer. This is then connected locally to the National Grid network





Figure 1: Phase 1 Habitat Map of the Survey Area



### 3 SURVEY AND ASSESSMENT METHODOLOGY

#### 3.1 Data Search

- 3.1.1 Lincolnshire Environmental Records Centre (LERC) was consulted for records of birds within 2km of the site.

#### 3.2 Survey Area

- 3.2.1 The site consisted of seventeen (predominantly arable) agricultural fields; with occasional patches of dense scrub, broadleaved woodland and five ponds. Hedgerows, ditches and woodland made up the site boundaries. The wider landscape is characterised by the industrial steelworkings to the west of the site, and further arable farmland and plantation woodland to the north and east. Beyond the woodland to the south lies a recently constructed solar array.

#### 3.3 Survey Timings and Protocol

- 3.3.1 The site was surveyed for breeding birds four times between April 2018 and July 2018, to identify which bird species were using the site for breeding or exhibited territorial behaviour and which habitats appeared to be of greatest value.
- 3.3.2 The surveys were carried out on the following days, under the weather conditions described in Table 1 below. Due to the large size of the site, some of the visits (namely visits 1 and 2) were split over two days.

Table 1: Dates and Weather Conditions during Breeding Bird Surveys

Survey Number	Date	Description of weather: Precipitation; Cloud (Oktas); Wind (Beaufort Scale)	Temperature (°C)	Timings
1	16/04/2018	Dry, Cloud 2, Wind 4	11-15	08:00 – 13:00
	17/04/2018	Dry, Cloud 2, Wind 4	8-10	08:00 – 11:30
2	03/05/2018	Dry, Cloud 3, Wind 2	10-16	08:30 – 13:00
3	11/06/2018	Dry, Cloud 1, Wind 2	10-22.5	05:15 – 11:00
	12/06/2018	Intermittent light drizzle, Cloud 8, Wind 2	13-16	08:00 – 10:30
4	24/07/2018	Dry, Cloud 4, Wind 2	18-25	08:30 – 13:00

- 3.3.3 The survey followed BTO guidelines, where the observer systematically walked through the site, ensuring that all points on site were visited to within 50m. The location and behaviour of all birds and flocks of birds seen was noted on large-scale survey maps which were later collated onto master maps for interpretation. Particular attention was paid to bird exhibiting breeding behaviour, for instance birds in full song, exhibiting antagonistic behaviour/calling, carrying nest material, carrying food, and returning to nesting sites. Standard BTO Common Birds Census symbology and species codes were used to create a survey map of each individual visit.



### 3.4 Personnel

3.4.1 All surveyors have been assessed under the Clarkson and Woods QA processes as competent to complete the surveys.

3.4.2 Surveys were undertaken by Harry Fox BSc MCIEEM, Mark Baker BSc MCIEEM, James Latham BSc MCIEEM, Mike Hockey Grad CIEEM, and Steve Miller affiliate member of CIEEM. Harry, Mark, James, Mike and Steve are highly experienced bird surveyors able to identify all British species by sight and sound.

#### Mapping

3.4.3 The site was divided up into eight survey "zones" (largely comprising agricultural fields) and twelve "boundaries" (comprising hedgerows, scrub, woodland and ditches) according to similar habitat characteristics to assist in the interpretation of data (see Table 2 & Figure 2). This separation of the site's features allowed the relative usage of the site's habitats by notable species or numbers of species to be assessed. It should be noted that these zones and boundaries combine multiple fields and hedgerows and therefore the numbering differs from that used in the Phase 1 survey map (Figure 1).

Table 2: Zones and Boundaries numbering scheme

Zone No.	Description
1	Arable fields to the north-east of the site, sown with winter barley
2	Primarily arable fields sown with winter barley and early wheat, with a block of improved grassland present
3	Arable field to the south-east of the site sown with early wheat
4	Arable field to the south of the site sown with early wheat
5	Primarily semi-improved grassland fields to the south-west of the site
6	Primarily arable fields to the west of the site sown with oil seed rape
7	Arable field towards the centre of the site sown with oil seed rape
8	Arable fields towards the north of the site sown with vining peas
Boundary No.	Description
B1	Mixed plantation woodland to the east of the site and poultry farm
B2	Mixed plantation woodland to the south-east of the site
B3	Broad-leaved plantation woodland towards the centre of the site
B4	Broad-leaved plantation woodland to the south of the site dividing zones 3 and 4
B5	Hedgerow, scrub and woodland habitat to the south of the site
B6	Riparian woodland, hedgerows and scrub to the west of the site
B7	Broad-leaved plantation woodland, as well as an arable field containing a portion of bare ground surrounded by trees, situated to the north of the site
B8	Broad-leaved plantation woodland and hedgerows dividing zones 6 and 7
B9	Dense scrub and hedgerow between zones 7 and 8
B10	Hedgerows and ditch in the centre of the site
B11	Hedgerow with ditch to the north of zone 4
B12	Hedgerows and ditches to the south-west of the site



Figure 2: Map showing Habitat/Boundary Zones





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## 4 SURVEY LIMITATIONS

### *Survey*

- 4.1.1 Nocturnal bird surveys were not undertaken and as such the activity on site of birds such as owls cannot be determined. In lieu of survey data, a judgement has been made based on the results of the data search and the presumed value of the habitats on site to such species.
- 4.1.2 The surveys offer only 'snapshots' of the Site and whilst trying to account for seasonal differences, may miss certain species which attend the site infrequently or which might choose to take up residence subsequent to completion of the surveys. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.
- 4.1.3 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.

### *Site Compound Area*

- 4.1.4 The survey area did not encompass the entire field surrounding the former oil well in the north east of the site, which is expected to be used to house the temporary site compound during construction of the array. This field was added to the application scheme subsequent to the completion of the breeding bird surveys. The red line boundary was amended to include this area after the surveys had been completed. The use of this area by breeding birds was not fully investigated and it is possible that bird species (including those of conservation concern) using this area were not recorded. However the survey route did follow the southern boundary of this field and this area was included within survey boundary zone B7 (figure 2 refers). As such any conspicuous activity by birds exhibiting territorial behaviour within the southern portion of this field (such as display flights or calls) would likely have been recorded, and the surveyors also noted any movement of birds into and out of this area. However it is likely that small numbers of birds and territories/nest sites within the area would have gone unrecorded as, unlike the rest of the fields within the survey area, the surveyor would not have flushed birds sat on nests. It is noted that the arable land present in this field is relatively small in size (circa 2.1 ha) and predominately surrounded by tall woodland and trees, and therefore suboptimal for certain open farmland bird species due to a lack of clear sightlines for predator detection.
- 4.1.5 Overall, the findings of the survey (particularly the results recorded within B7) are therefore considered to depict a reasonable but not a precise reflection of the bird use of this area during the survey period.



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## 5 RESULTS

### 5.1 Data Search – Protected and Notable Species

#### **Data obtained from Lincolnshire Environmental Records Centre (LERC)**

- 5.1.1 The data search identified 65 notable bird species within 2km of the site since 2000 which winter in the UK (or are vagrants) and are considered relevant to this report. These species and their conservation designations are detailed in Section 8 at the end of this report. Additional records beyond the most recent record for each species have been excluded.
- 5.1.2 A number of birds within Section 8 were recorded within the site. This includes Lapland bunting *Calcarius lapponicus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, brambling *Fringilla montifringilla*, tree sparrow *Passer montanus*, fieldfare *Turdus pilaris* and hobby *Falco subbuteo*.
- 5.1.3 Details of the legislation affecting those protected species which have been identified as occurring on the site from the wintering bird surveys, or potentially occurring on the site given their ecological requirements, are detailed in Section 6.

#### **Data Search – Local Conservation Priorities**

- 5.1.4 Farmland birds as a group are identified as targets for conservation within the Lincolnshire Biodiversity Action Plan (BAP) 2011-2020 (3<sup>rd</sup> Edition). The species of bird listed within this group are:
- Grey partridge *Perdix perdix*
  - Lapwing *Vanellus vanellus*
  - Yellow wagtail *Motacilla flava*
  - Skylark *Alauda arvensis*
  - Corn bunting *Miliaria calandra*
  - Linnet *Carduelis cannabina*
  - Yellowhammer *Emberiza citronella*
  - Reed bunting *Emberiza schoeniclus*
  - Turtle dove *Streptopelia turtur*
  - Bullfinch *Pyrrhula pyrrhula*
  - Starling *Sturnus vulgaris*
  - Tree sparrow *Passer montanus*
  - Snipe *Gallinago gallinago*
  - Curlew *Numenius arquata*
  - Redshank *Tringa totanus*
  - Barn owl *Tyto alba*
- 5.1.5 These species have been identified as local conservation priorities and therefore will be given appropriate additional weight within the ES Chapter.
- 5.2 Field Survey
- 5.2.1 In total, 55 bird species (including woodpigeon *Columba palumbus* and pheasant *Phasianus colchicus* which were not enumerated) were recorded during the survey visits. 21 of these were BTO Birds of



Conservation Concern red/amber lists<sup>1</sup> or Species of Principal Importance (SPI)<sup>2</sup>, comprising 10 'red listed' birds and 11 'amber listed' birds. 10 species were listed as being SPI for nature conservation and as such are capable of being material considerations within the planning process. The patterns of abundance and distribution of each of these species is discussed later in this section, with greatest detail given to birds of conservation concern and SPIs.

- 5.2.2 Table 4 shows the numbers of each species encountered across all the survey visits with the peak count(s) of sightings highlighted. This enables patterns in changing abundance of each species to be observed over the course of the breeding season.
- 5.2.3 Table 5 shows the peak counts of each species recorded in each survey zone/ boundary. This allows the relative usage of each survey zone and habitat type to be inferred. The information in this table will be discussed in the next section for each notable species in turn.
- 5.2.4 In Tables 4 and 5, the bird species are colour coded to indicate their conservation status and their likely breeding status on-site is indicated by abbreviations as outlined in Table 3 below:

Table 3: Colours and symbols used in Tables 4 and 5 below

Bold text	Listed under Section 41 of the NERC Act 2006 (Species of Principal Importance - SPIs) or UK Biodiversity Action Plan species
Red fill	'Red listed' species according to BTO/RSPB Bird of Conservation Concern
Orange fill	'Amber listed' species according to BTO/RSPB Bird of Conservation Concern
Yellow fill	Peak Count of Survey for each species
Y	Breeding confirmed (nests located or adults with food/nest material, or fledglings seen)
Pr	Breeding probable
Po	Breeding possible
N	Not likely to breed on site

<sup>1</sup> Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. >50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (>25% but <50% in 25 years) declined historically but recovered recently, rare breeders (fewer than 300 pairs), internationally important populations in the UK, localised populations and those with an unfavourable conservation status in Europe.

<sup>2</sup> Species of Principal Importance (SPI) are listed in section 41 of the Natural Environment and Rural Communities (NERC) Act 2006





Table 4: Numbers of Each Species Recorded During Each Survey Visit

Common Name	Latin Name	Visit				Breeding?
		1	2	3	4	
Greylag goose	<i>Anser anser</i>	2				N
Moorhen	<i>Gallinula chloropus</i>		1		2	Y
Lapwing	<i>Vanellus vanellus</i>	2	4	1	7	Pr
Woodcock	<i>Scolopax rusticola</i>		1			N
Herring gull	<i>Larus argentatus</i>		1	3	2	N
Lesser black-backed gull	<i>Larus fuscus</i>		2			N
Tawny owl	<i>Strix aluco</i>			1		Po
Buzzard	<i>Buteo buteo</i>	1	2	3	4	Po
Kestrel	<i>Falco tinnunculus</i>	2	2	2	2	Pr
Red legged partridge	<i>Alectoris rufa</i>	10	7	3	9	Pr
Stock dove	<i>Columba oenas</i>	1	1			N
Great spotted woodpecker	<i>Dendrocopos major</i>	1		1		Po
Cuckoo	<i>Cuculus canorus</i>			1		N
Skylark	<i>Alauda arvensis</i>	68	47	35	12	Y
Meadow pipit	<i>Anthus pratensis</i>	2	2	6		Pr
Yellow wagtail	<i>Motacilla flava</i>		4	8		Pr
Pied wagtail	<i>Motacilla alba</i>	1		2	1	Po
Dunnock	<i>Prunella modularis</i>	4	4	9	3	Pr
Robin	<i>Erithacus rubecula</i>	19	9	13	2	Y
Blackbird	<i>Turdus merula</i>	28	9	21	4	Y
Song thrush	<i>Turdus philomelos</i>	3		3	1	Po
Mistle thrush	<i>Turdus viscivorus</i>		3	2		Po
Treecreeper	<i>Certhia familiaris</i>	1				Po
Nuthatch	<i>Sitta europaea</i>		1		2	N
Swallow	<i>Hirundo rustica</i>	3	8	16	12	N
Swift	<i>Apus apus</i>			1		N
Lesser whitethroat	<i>Sylvia curruca</i>			1		N
Whitethroat	<i>Sylvia communis</i>	1	16	19	5	Pr
Goldcrest	<i>Regulus regulus</i>	1	3			Po
Wren	<i>Troglodytes troglodytes</i>	26	17	31	7	Y
Great tit	<i>Parus major</i>	9	10	10	1	Pr
Blue tit	<i>Cyanistes caeruleus</i>	20	15	23	15	Pr
Long-tailed tit	<i>Aegithalos caudatus</i>		4	1		Pr



Common Name	Latin Name	Visit				Breeding?
		1	2	3	4	
Blackcap	<i>Sylvia atricapilla</i>	13	20	24		
Coal tit	<i>Parus ater</i>	4	1	2		Po
Carrion crow	<i>Corvus corone</i>	8	1	6	37	Po
Jay	<i>Garrulus glandarius</i>	1				N
Magpie	<i>Pica pica</i>	1	1		3	Po
Brambling	<i>Fringilla montifringilla</i>		4	2		Po
Goldfinch	<i>Carduelis carduelis</i>	3	11	42	18	Y
Chaffinch	<i>Fringilla coelebs</i>	47	34	38	18	Y
Chiffchaff	<i>Phylloscopus collybita</i>	11	7	6	2	Pr
Greenfinch	<i>Carduelis chloris</i>			4	4	Po
Willow Warbler	<i>Phylloscopus trochilus</i>	8	16	5	1	Pr
Garden warbler	<i>Sylvia borin</i>		3	1		Po
Wheatear	<i>Oenanthe oenanthe</i>			3		N
Bullfinch	<i>Pyrrhula pyrrhula</i>		2	5		Pr
Linnet	<i>Linaria cannabina</i>	17	20	39	23	Y
Reed bunting	<i>Emberiza schoeniclus</i>	2	8	14	17	Y
Yellowhammer	<i>Emberiza citrinella</i>	15	8	16	11	Y
Total Individuals		338	309	430	225	
Number of Species		34	38	41	28	

Note that wood pigeon and pheasant were excluded from the survey. They were recorded as present on all visits but counts were not made.



Table 5: Results of the Breeding Bird Survey (Peak Counts of Birds within Each Habitat Type)

Common name	Peak counts for each species per zone								Peak counts for each species per boundary											
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Greylag goose					2															
Moorhen																		1		
Lapwing						4		1												
Woodcock																			1	
Herring gull			1	2	1															
Lesser black-backed gull						2														
Tawny owl															1					
Buzzard		1		1	1	1				1					1					
Kestrel	1	1			2										1					
Red legged partridge	2	2		2		3									2	3		2		
Stock dove				1		1														
Great spotted woodpecker									1		1									
Cuckoo															1					
Skylark	12	29	8	5	4	8	7	2												1
Meadow pipit	1	4			2															
Yellow wagtail	4	1	3				2												1	
Pied wagtail		2						1												
Dunnock					1	3							1	1	1			1	2	1
Robin	4					2		1	4	2		1	2	4	1	3	2	1	1	1
Blackbird	3	3			1	1		4	3	3	3	1	4	2	4	1	3	1	5	
Song thrush						1				2				1				1	1	
Mistle thrush	1	1		1		1						2			1	1				
Treecreeper										1										
Nuthatch										1										
Swallow	3			1	11	1	2	1								2				
Swift		1																		
Lesser whitethroat														1						



Common name	Peak counts for each species per zone								Peak counts for each species per boundary											
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Whitethroat					2	3	1				1			2	1	1	1	5	2	3
Goldcrest										1		1		1			1			
Wren	4				1	4		1	3	3	3	4	1	2	4	2	2		2	3
Great tit		1				1			1	1	3	1	1	1	1	3	3		1	1
Blue tit	4	3			1	2		2	4	2	2	3	1	1	2	4	3	1	2	3
Long-tailed tit															1				4	
Blackcap	4	1			1	2		1	2	5	3	1	3	3	3	4	2		2	1
Coal tit										1	1	1	1		1		1			
Carrion crow			1		3		30	3							2		1	1	1	
Jay										1										
Magpie														1						
Brambling									1		1	1			2					
Goldfinch	25	2	1			1		2							2	4	6	6	1	
Chaffinch	7	2			3	5		9	1	4	3	2	4	6	4	6	3	8	2	2
Chiffchaff						2		2	2	1			2	2	3					1
Greenfinch		1														1		1		1
Willow Warbler	1												2	9	4				1	1
Garden warbler										1								1	1	1
Wheatear																			3	
Bullfinch						1								1		2			2	
Linnet	26	4			2	3	5	2		2				2	1		2	5	1	4
Reed bunting	4	3			2	2	1							3		2	3	1	2	
Yellowhammer	3	2			2	2								4		6	1	3	1	3
Count of Species	18	19	5	7	21	25	7	14	10	16	10	11	11	21	23	16	14	16	21	14



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### *Overall Assemblage*

- 5.2.5 The breeding bird assemblage was diverse: comprising typical species of farmland, woodland and hedgerows. Numerous summer visitors were recorded, including cuckoo, swift, swallow, willow warbler, chiffchaff, blackcap, and yellow wagtail. Other species were residents, though numbers may be swelled by an influx of migrant birds.

### *Temporal Changes (within season)*

- 5.2.6 Over the course of the four surveys, the level of usage of the site by certain species varied a little. The peak number of individuals and species was recorded during Visit 3 at the beginning of June. The lowest number of species and individuals were recorded during the 4<sup>th</sup> visit in late July. It was noted that the majority of fields had been harvested by the 4<sup>th</sup> survey which may account for the drop in numbers of species which inhabit the centre of arable fields, such as skylarks, meadow pipits and yellow wagtail. The 4<sup>th</sup> visit was also conducted during an extended period of dry, hot weather which is likely to result in lower bird activity generally.

### *Red-listed Species*

#### Skylark

- 5.2.7 The skylark is a species mainly associated with arable habitats, grassland and moorland in the UK. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).
- 5.2.8 Skylark were recorded on each visit with peak numbers in the arable land in Zone 1 during Visit 1. Sightings were spread between across all Zones, although there was a stronger association Zones 1 and 2 in the north east of the site. The majority of fields at the site are suitable for breeding skylark as they provide a good supply of suitable open space, nesting and food resources as well as long sightlines for predator monitoring.
- 5.2.9 The site supports an excellent population of skylark and surveys indicate this is around 25 territories. Figure 3 provides a distribution map of skylark found during the survey

#### Yellow Wagtail

- 5.2.10 Yellow Wagtails are farmland bird which are usually found in damp habitats such as marshes, lowland meadows and river valleys, but there has been much greater use of arable habitats over recent years, with oil-seed rape, legume and root crops increasingly used for breeding.
- 5.2.11 The population has fallen by an estimated 75 per cent between 1970 and 2009. It is thought that land drainage, the conversion of pasture to arable and a decline in invertebrate numbers (notably those associated with livestock) may be behind the decline, although the species is a long-distance migrant so changes in conditions at wintering or passage grounds cannot be ruled out
- 5.2.12 Yellow wagtail were recorded in reasonably low numbers (peak of 8) during visits 2 and 3. This species was absent during visit 1 and visit 4, although survey visit 1 was conducted when yellow wagtail are still arriving in the UK from overseas. Most observations were made within Zones 1 and 2 in the north east of the site as well as in Zone 7 in the central western area. Individuals were also recorded in Zone 3 in the south east of the site during the third visit.



- 5.2.13 The site supports a modest population of yellow wagtail and surveys indicate this is around 3 territories. Figure 4 provides a distribution map of yellow wagtail skylark found during the survey

#### Lapwing

- 5.2.14 Lapwing are a typical bird of farmland, wetland and upland grassland, but now in major decline due to habitat loss.
- 5.2.15 The site constitutes suitable lapwing breeding habitat as they are known to nest on spring tilled arable fields comprising solely bare ground which also provides a good foraging resource. Lapwing were observed in small numbers (peak of 7) on site in Zone 7 during visits 1, 2 and 4. Display, calling and courtship behaviour was noted between those seen on site on these two visits. No nesting behaviour was observed at the site during the third visit, although an individual was seen flying overhead in Zone 8 during Visit 3.
- 5.2.16 The site supports a low population of breeding lapwing and surveys indicate this is probably 1 or 2 territories. Figure 5 provides a distribution map of lapwing found during the survey

#### Yellowhammer

- 5.2.17 Yellowhammers are mainly associated with open countryside and hedgerows. This species is red listed as a Species of Conservation Concern due to recent population declines. This is likely due to changes in agricultural practices, such as the removal of hedgerows and increased use of pesticides. Yellowhammers were most regularly observed within the Boundary habitats particularly in the hedgerows and B8 and B6. These features offer suitable nesting habitat e site offers suitable habitat for foraging yellowhammers and appears to support modest numbers, with a peak count of 16 recorded during Visit 3.

#### Linnet

- 5.2.18 Linnets are found on farmland wherever there is a plentiful supply of seeds throughout the year. Mixed farmland is particularly valuable. They nest in dense hedgerows, bramble or other types of scrub.
- 5.2.19 Linnet numbers have dropped substantially over the past few decades, with the UK population estimated to have declined by 57 per cent between 1970 and 2008. This is largely the result of a lack of food sources in modern farming. Linnet is a red listed bird of conservation concern and a Species of Principal Importance.
- 5.2.20 Linnet were recorded on each survey visit in low to moderate numbers and the site appears to support a medium population. No particular association with either the boundary or open field habitats was noted, although a moderate flock of 25 birds were seen flying over Zone 1 during visit 3.

#### *Amber-listed Species*

#### Meadow pipit

- 5.2.21 Like skylarks, meadow pipits are associated with open arable, grassland and heathland habitats, are ground dwelling birds and have undergone declines in recent years, hence their amber status.
- 5.2.22 Relatively low numbers of these birds were encountered in each visit, aside from the 4<sup>th</sup> visits when none were seen or heard. They were primarily found within open habitats to the east of the site, as for skylarks. The site appears to support a small population of meadow pipit which are likely to nest within the fields.



The surveys indicate this is probably 1 or 2 territories. Figure 6 provides a distribution map of meadow pipit found during the survey.

#### Dunnock

- 5.2.23 Dunnock inhabit any well vegetated areas with scrub, brambles and hedges, including field edges. They spend large amounts of time on the ground in amongst grassland but also remain close to shrubby vegetation cover. Dunnock abundance fell substantially between the mid-1970s and mid-1980s, after a period of population stability. Some recovery has occurred throughout the UK since the late 1990s. Dunnock is an amber listed Species of Conservation Concern and a Species of Principal Importance.
- 5.2.24 Dunnock were recorded in low numbers during each survey visit, and were primarily observed with the boundary habitats. This species is present all year round and the site appears to support a small breeding population.

#### Willow warbler

- 5.2.25 Willow warbler are associated with scrub and open woodland and are amber listed due to recent breeding and wintering population decline and reduction in breeding and wintering range.
- 5.2.26 This species were recorded in small numbers within the boundary habitats across the site during each, and were most regularly recorded at the woodland edge at the western site boundary (B6). The site probably supports small breeding population.

#### Reed bunting

- 5.2.27 Reed bunting is a resident species that is typically found in wet vegetation, but has more recently spread into farmland. It nests close to the ground amongst dense vegetation including ditch banks. They feed on the ground and in ditches and banks and favour damp or marshy grassland and swamps.
- 5.2.28 Reed bunting numbers in the UK have been declining since the mid-1970s, due to habitat loss. Reed bunting is an amber listed Species of Conservation Concern and a Species of Principal Importance.
- 5.2.29 Observations of this species occurred on site primarily in the arable field in Zones 1 and 2, as well as the hedgerow, tall ruderal and ditch habitat at Boundaries 8, 9 and 11. The surveys identified approximately four territories of this species. Figure 7 provides a distribution map of reed bunting found during the survey.

#### Kestrel

- 5.2.30 Kestrel are a relatively common and widespread bird of prey species, although are amber listed due to recent declines in population and range. Two observation of these species were observed during each survey visit, primarily flying over the open fields. The grassland present at the field margins and fields in Zone 5 provide optimal habitat for small mammals, which is the chief food source for kestrels. This species could nest in the trees or pylons present within the site, but would be more likely to nest within the woodland edges around the site.

#### *Other Birds of Conservation Concern*

- 5.2.31 Individuals or small numbers of each of woodcock, herring gull, cuckoo, song thrush and mistle thrush (red-listed species) as well as greylag goose, lesser black-backed gull, tawny owl, stock dove, swift, and bullfinch (amber-listed species) were recorded on one or two occasions and did not show a persistent



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association with the site. It is therefore likely that they are not present within the site throughout the breeding season but may use the site opportunistically.



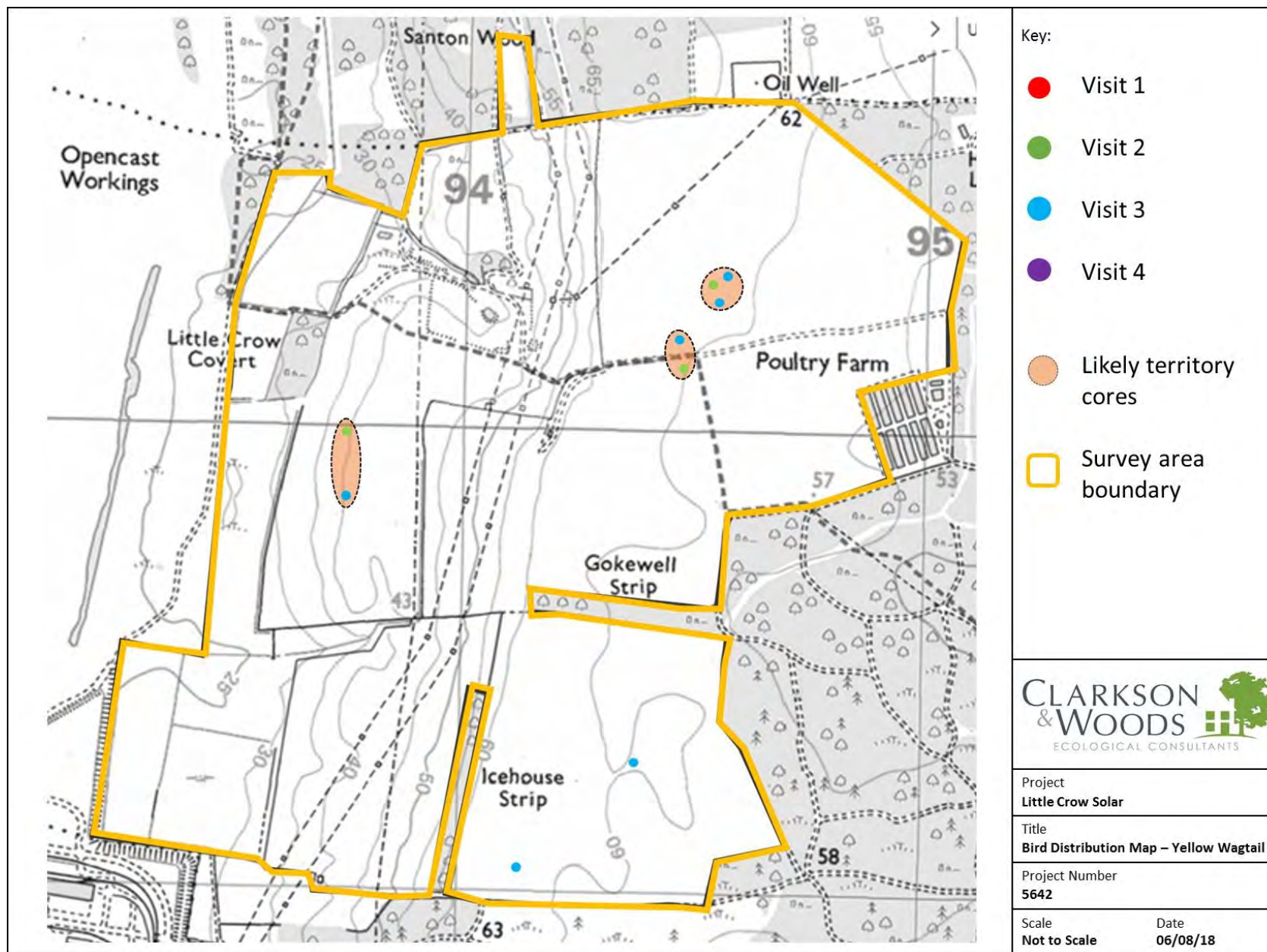


Figure 3: Skylark Distribution Map

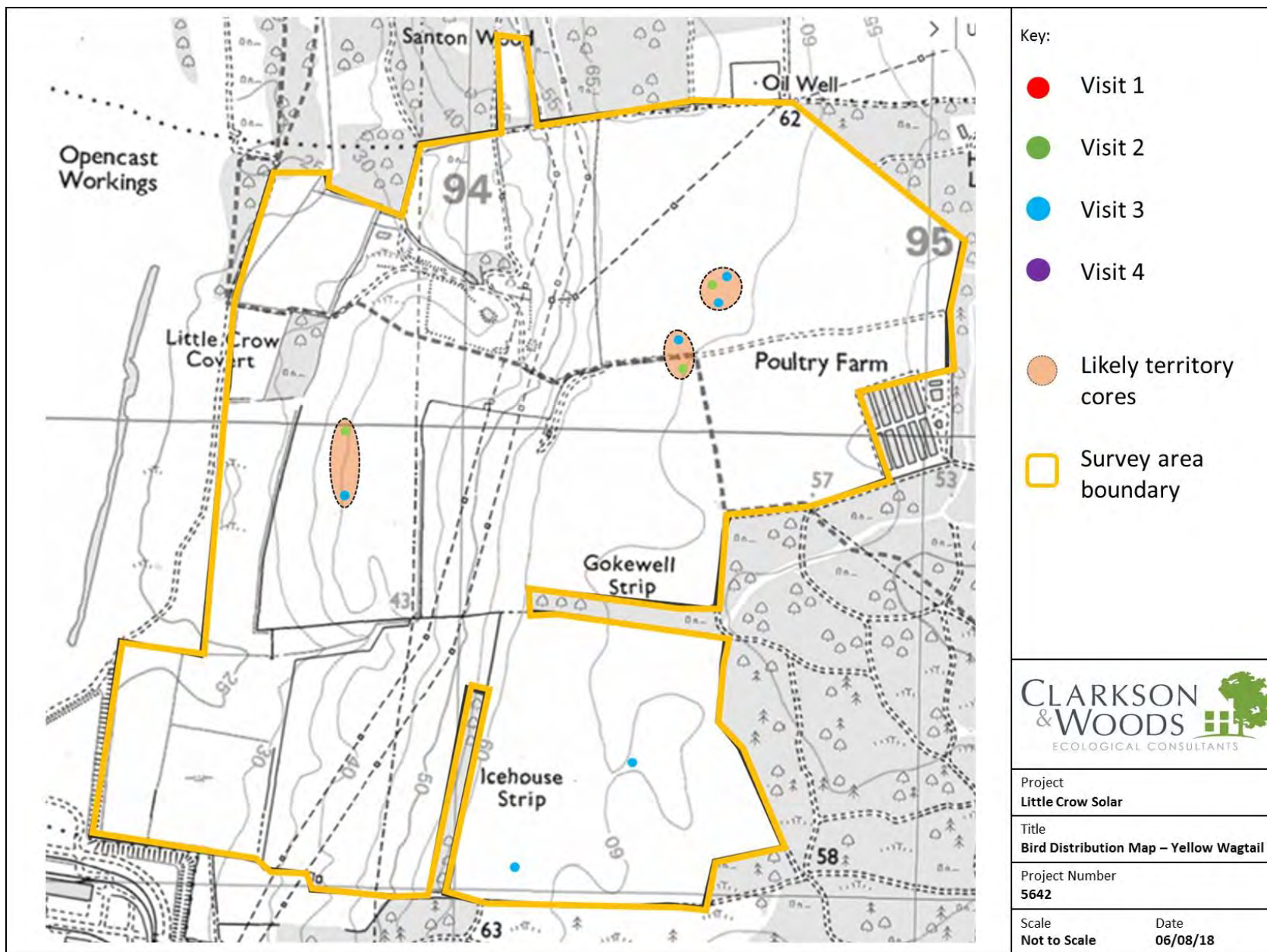


Figure 4: Yellow Wagtail Distribution Map



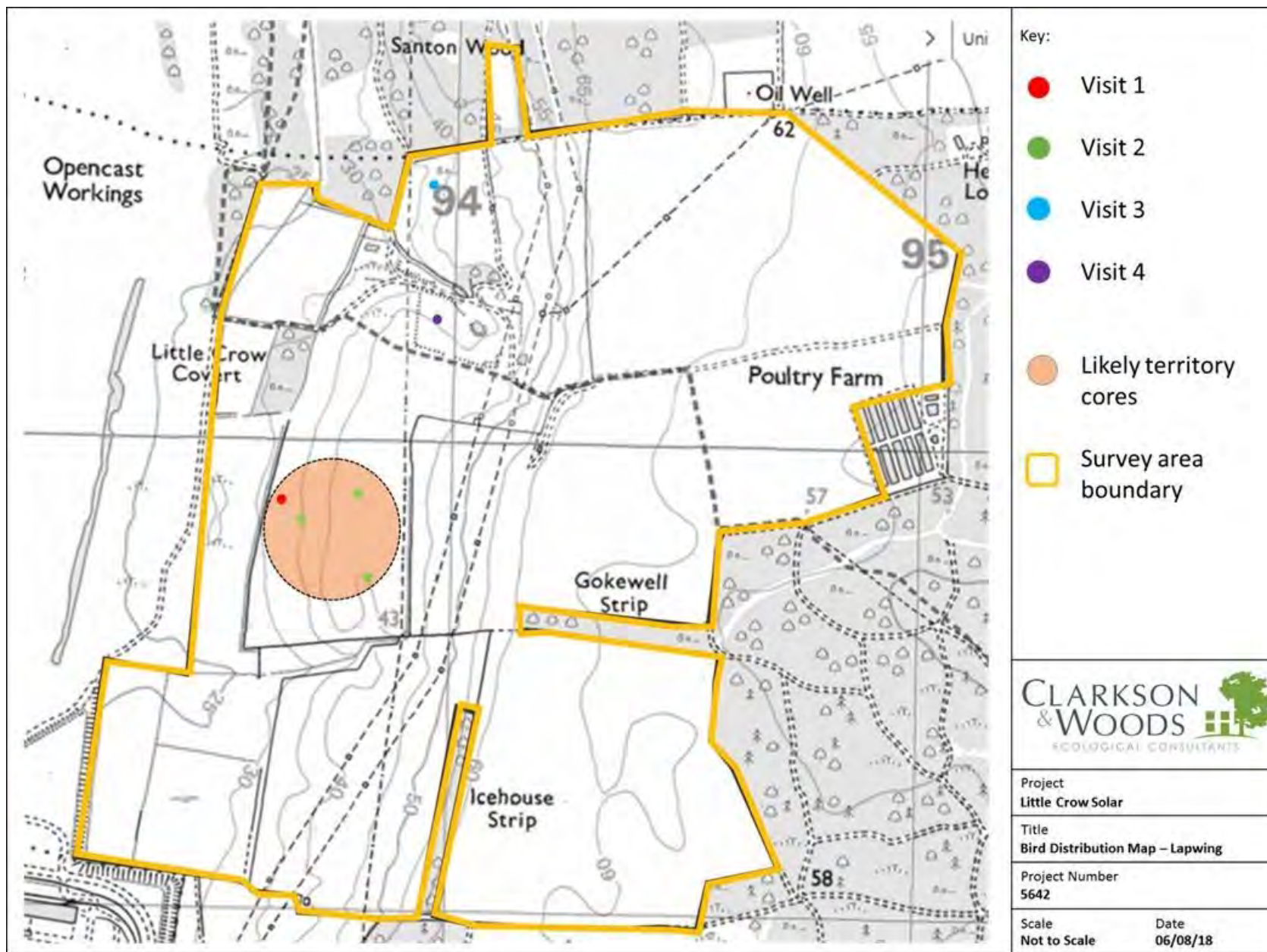


Figure 5: Lapwing Distribution Map

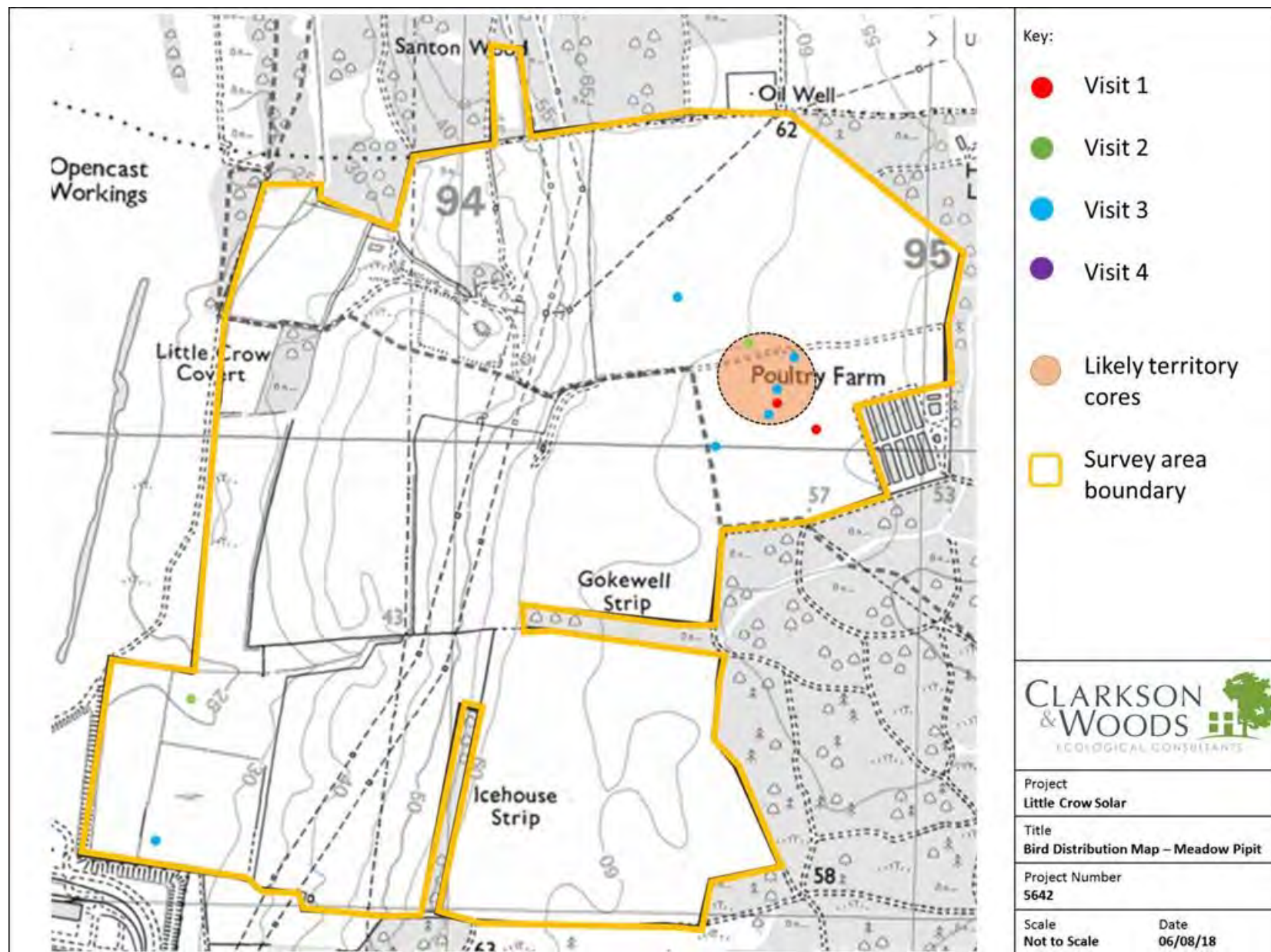


Figure 6: Meadow Pipit Distribution Map



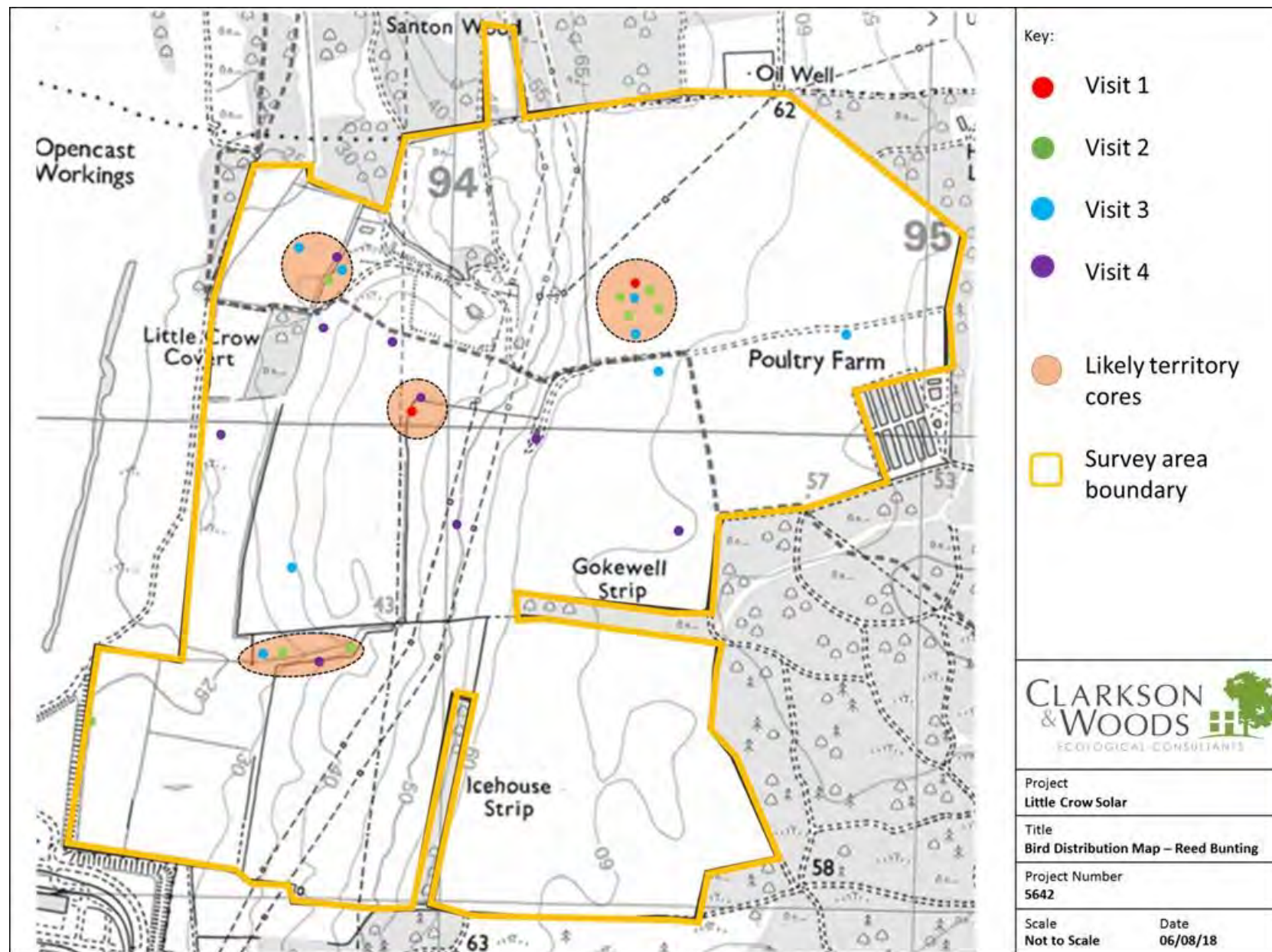


Figure 7: Reed Bunting Distribution Map



## 6 SUMMARY

- 6.1.1 A total of 55 species were identified; of which 10 were red listed birds and 11 were amber listed birds. Of these 21 bird species, 10 are also Species of Principal Importance under the NERC Act (2006) and so are a material consideration for planning.
- 6.1.2 The notable birds utilising the site can be split into two distinct categories; those which were recorded predominantly within open habitats and those recorded foraging predominantly in boundary habitats such as woodland and hedgerows.
- 6.1.3 The birds within open habitat are more likely to be directly impacted installation of a solar array. The approximate number of territories the site supports for each of these species is summarised in the Table 6 below. Although included in this summary, reed bunting may also utilise boundary habitat for nesting.

Table 6: Summary of Breeding Birds of Open Farmland

Birds Recorded within Open Habitats	Approximate Number of Territories
Skylark	25
Yellow wagtail	3
Lapwing	1 or 2
Meadow pipit	1 or 2
Reed bunting	3

- 6.1.4 Table 7 summaries the notable bird species that were either confirmed to be breeding or considered probably breeding within the boundary habitats at the site:

Table 7: Summary of Breeding Bird Associated with Boundary Habitats

Birds Recorded within Open Habitats
Kestrel
Dunnoch
Song Thrush
Mistle Thrush
Willow Warbler
Bullfinch
Linnet
Yellowhammer



## 7 WILDLIFE LEGISLATION & SPECIES INFORMATION

### BIRDS

All British birds, their nests and eggs (with certain exceptions) are protected under the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to: intentionally kill, injure or take a wild bird; intentionally take, damage or destroy nests which are in use or being built; intentionally take or destroy birds' eggs; or possess live or dead wild birds or eggs. A number of species receive additional protection through inclusion on Schedule 1 of the Wildlife and Countryside Act; for these it is also an offence to intentionally or recklessly disturb birds while nest building, or at a nest containing eggs or young, or to disturb the dependant young of such a bird. Penalties for offences against bird species include fines of up to £5,000 and/or up to six months in prison.

General licences for control of some bird species are issued by Natural England and Natural Resources Wales in order to prevent damage or disease, or to preserve public health or public safety, but it is not possible to obtain a licence for control of birds or removal of eggs/nests for development purposes. Consequently if nesting birds are present on a development site when works are programmed to start it is usually necessary to delay works, at least in the areas supporting nests, until any chicks have fledged and left the nest. It is usually possible, once chicks have hatched, for an experienced ecologist to predict approximately when they are likely to fledge, in order to inform programming of works on site.

### PLANNING POLICY IN RELATION TO BIODIVERSITY - ENGLAND

The National Planning Policy Framework (NPPF), issued in March 2012, has superseded Planning Policy Statement 9: Biodiversity and Geological Conservation (August 2005). Additional guidance can be found online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. Further guidance is also available within the Government Circular ODPM 06/2005 on Biodiversity and Geological conservation although it should be noted that this document is currently being updated by DEFRA. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 109), including:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 115):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 118) by applying principles including:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and
- the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.



The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

## ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

In England, the National Planning Policy Framework (NPPF), issued in March 2012, states that the planning system should contribute to "*minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*". It also states that "*opportunities to incorporate biodiversity in and around developments should be encouraged*".





## 8 LERC RECORDS OF BIRDS FROM SURROUNDING 2KM

Species Name	Common Name	Date	Abundance	Designations
<i>Acanthis cabaret</i>	Lesser Redpoll	04/03/2015	3 Present (Count: Exact)	BoCC4-Red, Sect.41, Sect.42,
<i>Accipiter gentilis</i>	Goshawk	06/12/2003	1 Present (Count: Exact)	WCA1i,
<i>Alauda arvensis</i>	Skylark	27/06/2015	4 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41
<i>Alcedo atthis</i>	Kingfisher	01/11/2015		BoCC4-Amber, WCA1i,
<i>Anas acuta</i>	Pintail	23/11/2011	3 Present (Count: Exact)	BoCC4-Amber, WCA1ii,
<i>Anas penelope</i>	Wigeon	08/03/2015	1 Total (Count: Exact)	BoCC4-Amber,
<i>Anas strepera</i>	Gadwall	01/01/2013		BoCC4-Amber,
<i>Anser anser</i>	Greylag Goose	23/05/2015	2 Total (Count: Exact)	BoCC4-Amber, WCA1ii
<i>Anser brachyrhynchus</i>	Pink-footed Goose	01/11/2015		BoCC4-Amber,
<i>Anser fabalis subsp. fabalis</i>	Taiga Bean Goose	16/03/2011	8 Present (Count: Exact)	BoCC4-Amber,
<i>Anser fabalis subsp. rossicus</i>	Tundra Bean Goose	23/11/2011-07/12/2011	2 Juvenile (Count: Exact)	BoCC4-Amber,
<i>Aythya ferina</i>	Pochard	13/12/2015	2 Total (Count: Exact)	BoCC4-Red,
<i>Aythya marila</i>	Scaup	23/11/2011	1 1st calendar year male(s) (Count: Exact)	BoCC4-Red, Sect.41, , WCA1i,
<i>Bucephala clangula</i>	Goldeneye	20/12/2000	2 Present (Count: Exact)	BD2.2, BoCC4-Amber, WCA1ii,
<i>Calcarius lapponicus</i>	Lapland Bunting	27/10/2001	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
<i>Charadrius morinellus</i>	Dotterel	25/04/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i,
<i>Circus aeruginosus</i>	Marsh Harrier	11/01/2012-22/02/2012	4 Present (Count: Exact)	BoCC4-Amber, WCA1i,
<i>Clangula hyemalis</i>	Long-tailed Duck	06/12/2004	1 Present (Count: Exact)	BoCC4-Red, WCA1i
<i>Coccothraustes coccothraustes</i>	Hawfinch	February 2009	11 Present (Count: Exact)	BoCC4-Red, Sect.41, Sect.42,
<i>Cygnus columbianus subsp. bewickii</i>	Bewick's Swan	15/02/2002	2 Present (Count: Exact)	BoCC4-Amber, Sect.41, Sect.42, WCA1i,
<i>Cygnus cygnus</i>	Whooper Swan	19/03/2013	26 Present (Count: Exact)	BoCC4-Amber, WCA1i,
<i>Cygnus olor</i>	Mute Swan	01/04/2014		BoCC4-Amber,
<i>Emberiza calandra</i>	Corn Bunting	2005 - 2010		BoCC4-Red, LBAP:3,
<i>Emberiza citrinella</i>	Yellowhammer	25/11/2015	9 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,
<i>Emberiza schoeniclus</i>	Reed Bunting	25/11/2015	2 Total (Count: Exact)	BoCC4-Amber, LBAP:3, Sect.41, Sect.42,
<i>Falco columbarius</i>	Merlin	28/03/2012	1 Female (Count: Exact)	BD1, Bern2, BoCC4-Red, , WCA1i,i
<i>Falco peregrinus</i>	Peregrine	03/11/2015	1 Present (Count: Exact)	BD1, Bern2, CITESA, CMS_A2, LBCSchedule1, ScotBL, WCA1i,
<i>Falco subbuteo</i>	Hobby	02/08/2015	1 Total (Count: Exact)	WCA1i
<i>Fringilla montifringilla</i>	Brambling	25/01/2015	23 Present (Count: Exact)	WCA1i
<i>Gallinago gallinago</i>	Snipe	06/12/2014	1 Present (Count: Exact)	BoCC4-Amber, LBAP:3
<i>Gavia immer</i>	Great Northern Diver	12/01/2013	1 Present (Count: Exact)	BoCC4-Amber, WCA1i



Species Name	Common Name	Date	Abundance	Designations
<i>Gavia stellata</i>	Red-throated Diver	14/11/2011	1 Juvenile (Count: Exact)	WCA1i,
<i>Haliaeetus albicilla</i>	White-tailed Eagle	19/05/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i,
<i>Linaria cannabina</i>	Linnet	02/08/2015		BoCC4-Red, LBAP:3,
<i>Loxia curvirostra</i>	Common Crossbill	19/03/2014	22 Present (Count: Exact)	WCA1i,
<i>Loxia leucoptera</i>	Two-barred Crossbill	23/03/2014	1 Male (Count: Exact)	WCA1i
<i>Lullula arborea</i>	Woodlark	28/02/2014	1 Present (Count: Exact)	Sect.41, Sect.42, WCA1i
<i>Melanitta nigra</i>	Common Scoter	31/03/2005	1 Male (Count: Exact)	BoCC4-Red, Sect.41, Sect.42, WCA1i,
<i>Milvus milvus</i>	Red Kite	19/10/2014	1 Present (Count: Exact)	WCA1i,
<i>Numenius arquata</i>	Curlew	2005 - 2010		BoCC4-Red, LBAP:3, , Sect.41, Sect.42,
<i>Numenius phaeopus</i>	Whimbrel	08/08/2011	1 Present (Count: Exact)	BoCC4-Red, WCA1i, WO1i
<i>Passer domesticus</i>	House Sparrow	25/11/2015		BoCC4-Red, LBAP:3, , Sect.41, Sect.42,
<i>Passer montanus</i>	Tree Sparrow	02/08/2015		BoCC4-Red, LBAP:3, Sect.41, Sect.42,
<i>Perdix perdix</i>	Grey Partridge	03/10/2015	5 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,
<i>Pernis apivorus</i>	Honey-buzzard	02/10/2015	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
<i>Pyrrhula pyrrhula</i>	Bullfinch	25/11/2015	1 Total (Count: Exact)	BoCC4-Amber, , LBAP:3,
<i>Serinus serinus</i>	Serin	17/11/2007	1 Present (Count: Exact)	WCA1i
<i>Stercorarius parasiticus</i>	Arctic Skua	07/05/2002	1 Present (Count: Exact)	BoCC4-Red, , UKBAP
<i>Sturnus vulgaris</i>	Starling	25/11/2015	100 Total (Count: Estimate)	BoCC4-Red, LBAP:3
<i>Tringa glareola</i>	Wood Sandpiper	28/08/2002	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
<i>Tringa ochropus</i>	Green Sandpiper	20/06/2014	1 Present (Count: Exact)	BoCC4-Amber, WCA1i
<i>Tringa totanus</i>	Redshank	19/04/2011	4 Present (Count: Exact)	BoCC4-Amber, LBAP:3
<i>Turdus iliacus</i>	Redwing	06/12/2015	6 Present (Count: Exact)	BoCC4-Red, , WCA1i
<i>Turdus philomelos</i>	Song Thrush	15/06/2015	1 Total (Count: Exact)	BoCC4-Red, LBAP:3,
<i>Turdus pilaris</i>	Fieldfare	26/03/2014	400 Present (Count: Exact)	BoCC4-Red, WCA1i,
<i>Tyto alba</i>	Barn Owl	24/12/2015	1 Present (Count: Exact)	LBAP:3, WCA1i,
<i>Vanellus vanellus</i>	Lapwing	04/10/2015	8 Total (Count: Exact)	BoCC4-Red, LBAP:3, Sect.41, Sect.42,

Meaning of designations listed above

Designation	Meaning
BoCC4-Amber	BTO Amber List – Bird Population Status Amber
BoCC4-Red	BTO Red List – Bird Population Status Red
Sect.41/42	Section 41/42 of the NERC Act 2006/ UK Biodiversity Action Plan Species
WCA1i	Wildlife and Countryside Act 1981 Schedule 1
LBAP:3	Lincolnshire Biodiversity Action Plan (3 <sup>rd</sup> Edition)

## **APPENDIX 7.7**

### **BAT ACTIVITY SURVEY (CLARKSON & WOODS ECOLOGICAL CONSULTANTS, NOVEMBER 2018)**



# Little Crow

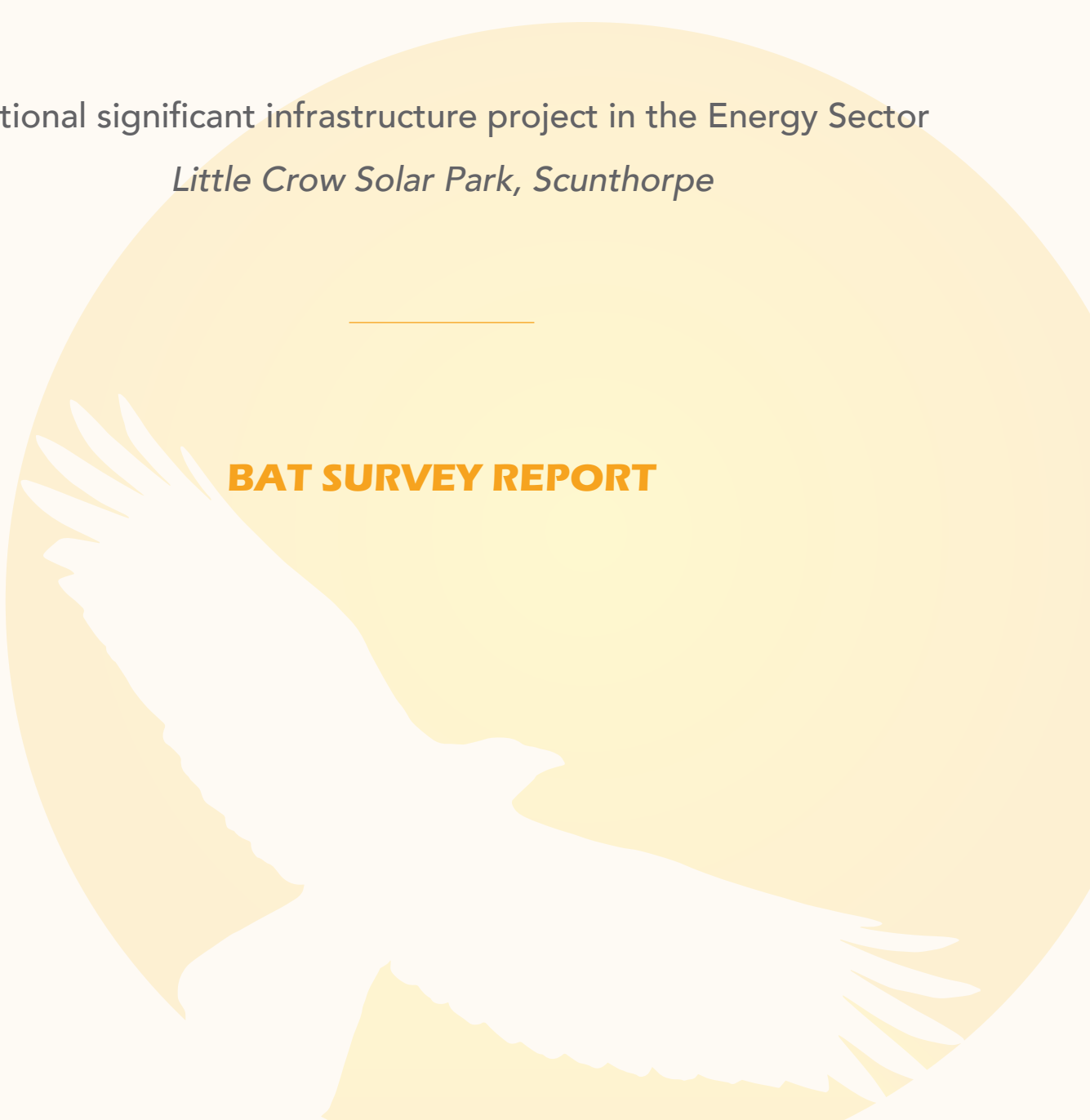
*Solar Park*

National significant infrastructure project in the Energy Sector

*Little Crow Solar Park, Scunthorpe*

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## **BAT SURVEY REPORT**



# BAT SURVEY REPORT

LITTLE CROW SOLAR, SCUNTHORPE, LINCOLNSHIRE

carried out by



commissioned by

INRG SOLAR (LITTLE CROW) LTD

OCTOBER 2018



# BAT SURVEYS

## LITTLE CROW SOLAR, SANTON, LINCOLNSHIRE

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Project title	Santon Solar Farm, Scunthorpe, Lincolnshire			
Project number	5642			
Document title	Bat Surveys – Interim Report			
Client	INRG Solar (Little Crow) Ltd			
Author	Charlie Durigan			
Status	Checked by	Date	Approved for C&W by	Date
V1	Peter Timms	19/07/18	Tom Clarkson	03/08/18
V2 –September survey results incorporated	Peter Timms	26/09/18	Hannah Montag	05/10/18

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



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## 1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by Pegasus Group on behalf of INRG to carry out bat surveys of land at Santon Solar Farm near Scunthorpe, Lincolnshire.
- 1.1.2 This report aims to inform a planning application for construction of a solar farm within the site. It details the methods and results of the surveys and informs the Environmental Statement (ES) Chapter on Ecology prepared for the site.
- 1.1.3 This report sets out the results of bat activity surveys carried out between April and September 2018.
- 1.1.4 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.
- 1.2 Development Proposals
  - 1.2.1 The proposed development comprises the construction of a photovoltaic solar farm. The installation of solar panels on metal frames are driven into the ground and connected by underground cables to a transformer, which is then connected locally to the National Grid network.
  - 1.2.2 The array will be situated within the fields with fencing utilised to secure the site.
- 1.3 Survey Aims
  - 1.3.1 Given the size of the development and significance of the proposed changes to land use, bat activity surveys were recommended to ascertain the level of use by foraging and commuting bats along with species composition and abundance. The objective of these surveys was to establish the value of the habitats and features and site as a whole to individual species of bats and bats in general in the context of the wider landscape.

## 2 SURVEY AND ASSESSMENT METHODOLOGY

- 2.1.1 The survey methods were based on current guidance set out by the Bat Conservation Trust (BCT)<sup>1</sup>.
- 2.1.2 Existing habitats on site principally comprise of arable fields, bounded by a network of hedgerow, ditches and plantation woodland. These habitat types are generally ubiquitous within the local landscape, and the most suitable habitat for foraging/commuting bats (woodland and hedgerows) are expected to remain unaffected by the development. The arable fields which comprise the main development zone were considered to offer few opportunities for foraging/commuting bats. Given the habitats on site and the likely impacts of the development, a level of survey effort consistent with that recommended for habitats of 'low' suitability was therefore considered appropriate. In line with the aforementioned BCT guidelines, one survey per season (Spring -April/May, Summer -June/July/August, Autumn - September/October) have been conducted at the site. The transect surveys have been augmented by automated bat detector surveys.

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<sup>1</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



## 2.2 Data Search

2.2.1 The Extended Phase 1 Report<sup>2</sup> should be referred to for details of the desk study and data search with the Local Records Centre undertaken to inform baseline conditions for the site.

## 2.3 Personnel

2.3.1 The following ecologists assisted with the walked transects and static detector surveys (as described below):

- *Peter Timms ACIEEM (Level 1 bat licence 2016-22469-CLS-CLS) (6 years' experience)*
- *Phil Bowater AIEMA GradCIEEM (Level 1 bat licence 2017-28070-CLS-CLS) (5 years' experience)*
- *Paul Kennedy ACIEEM (Level 2 bat licence- 2015-14471-CLS-CLS) (5 years' experience)*
- *Patrick Ellison GradCIEEM (5 years' experience)*
- *Chris Poole Grad CIEEM (1 years' experience)*

2.3.2 All of the above ecologists have been assessed under the Clarkson and Woods QA processes as competent to complete the survey.

## 2.4 Walked Transect Surveys

2.4.1 The transect surveys involved walking a predetermined transect at a constant speed using bat detectors and recording devices. Due to the relatively large size of the site, three separate transect routes were walked in order to ensure sufficient coverage of all areas of the site.

2.4.2 The three transect routes were designed to provide a balanced overview of bat activity across the entire site. The starting point was changed for each transect survey to avoid bias during the surveys. Figure 1 below shows the routes followed by the three transects.

2.4.3 Surveys were undertaken on three evenings in April, June and September during suitable weather conditions (low wind, little to no rain and temperatures at sunset of at least 10°C).

2.4.4 Surveyors were equipped with handheld bat detectors (Echo Meter Touch with an iPad Mini 4). The surveys commenced at approximately sunset and finished 2 hours after sunset.

2.4.5 The survey recordings were later analysed on a computer using Kaleidoscope (Wildlife Acoustics) software to confirm or identify species.

2.4.6 Table 1 provides the dates, weather conditions, sunset/sunrise times, survey start and end times and ecologist details for each of the walked transects.

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<sup>2</sup> Phase 1/Baseline Conditions Report – Little Crow Solar (July 2018) Clarkson & Woods



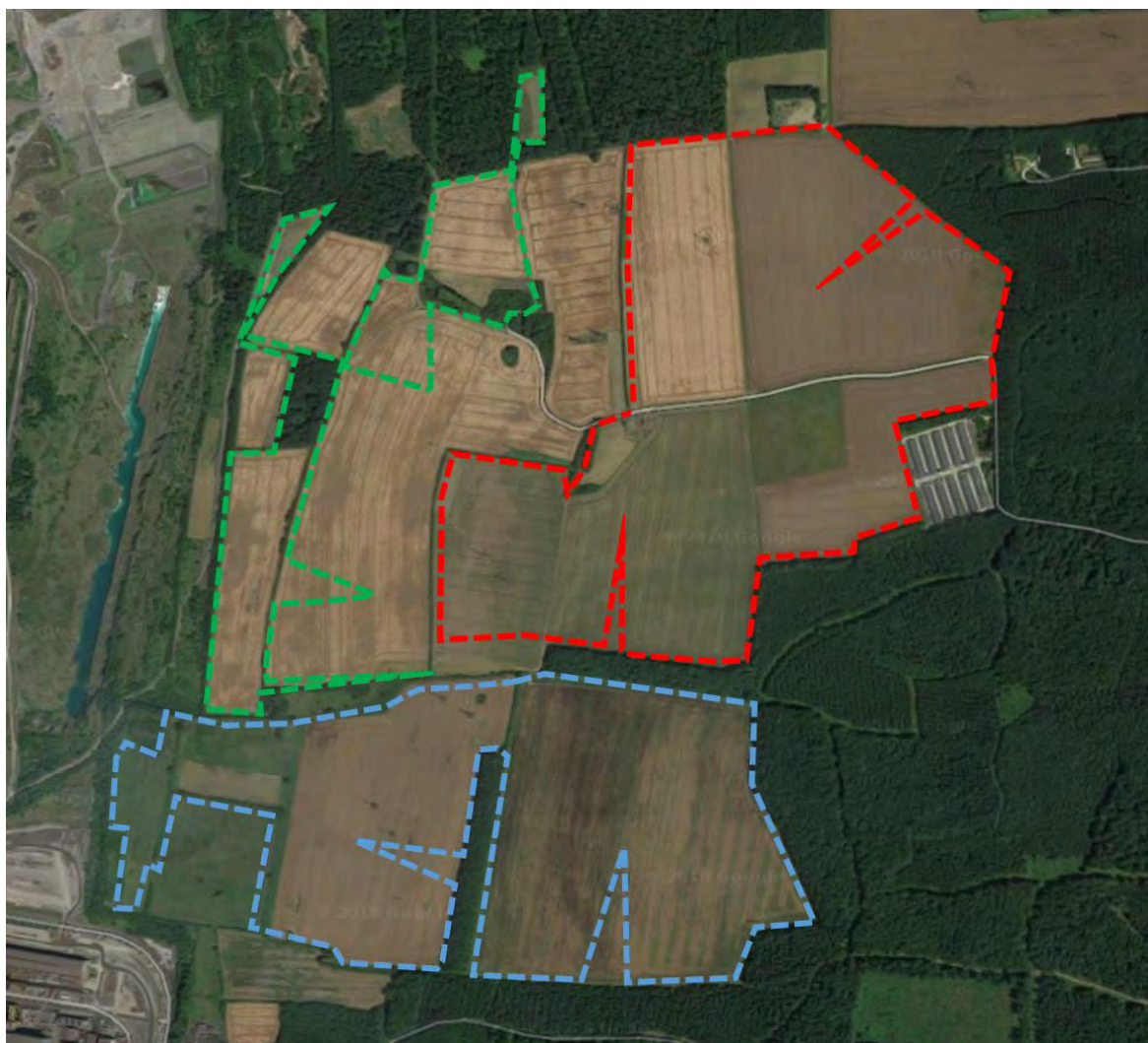


Figure 1: Walked transect routes covering the entire site

Table 1: Transect survey details

Date	Transect/ Ecologist	Sunset/ Sunrise	Survey Start Time	Survey End Time	Weather Conditions at Start	Weather Conditions at End
23/04/18	Blue / PB	20:16	20:16	22:16	13°C, 8/8 cloud cover, 4/12 wind speed, dry	12°C, 6/8 cloud cover, 4/12 wind speed, dry
	Green / PT					
	Red/ PE					
19/06/18	Blue / PT	21:34	21:34	23:34	22°C, 7/8 cloud cover, 1/12 wind speed, dry	20°C, 3/8 cloud cover, 0/12 wind speed, dry
	Green / CP					
	Red / PE					
04/09/18	Blue / PT	19:46	19:46	21:46	17°C, 4/8 cloud cover, 1/12 wind speed,	15°C, 6/8 cloud cover, 0/12 wind speed,
	Green / CP					
	Red / PK					

## 2.5 Static Automated Detector Surveys

2.5.1 Six automated static detectors (Anabat Express, Anabat Swift and Song ) were deployed across the site in April/May (Spring), June (Summer) and September (Autumn), for a minimum of six consecutive nights per deployment (refer to Table 2 below for deployment and collection dates). This is a higher survey effort than recommended by the BCT for sites of low suitability habitat. For the April and June Surveys, Anabat Express (Titley Scientific) detectors were deployed. For the September survey, one Anabat Express was deployed at Location F, two Anabat Swift detectors (also Titley Scientific) were deployed at Locations D and B, and three Wildlife Acoustics' SongMeter II+ detectors were deployed at Locations A, C and E. Detectors were placed in the same locations for all surveys, which were selected to focus on key habitat features identified during previous surveys and to ensure an even spread across the site. (Figure 2 refers). The detectors were programmed to begin recording at least 30 minutes before sunset and end recording 30 minutes after sunrise each night and logged bat passes in each static detector location.



Figure 2: Static Detector Locations

2.5.2 The deployment dates and weather conditions are detailed in Table 2 below.



### Automated Species Identification Protocol

- 2.5.3 Data downloaded from the static detectors was processed using Wildlife Acoustics' Kaleidoscope Pro automatic species recognition software and bat species and the number of bat passes was identified.

Table 2: Static detector deployment dates and weather conditions

Date	Nightly Temperature Range	Weather
24/04/2018	13-7°C	Passing shower and cloud, wind 3/12 (Beaufort scale)
25/04/2018	11-6°C	Passing clouds, dry, wind 4/12
26/04/2018	8-5°C	Scattered clouds, dry, wind 2/12
27/04/2018	9-6°C	Mostly cloudy, dry, wind 3/12
28/04/2018	8-7°C	Partly cloudy, dry, wind 4/12
29/04/2018	9-6°C	Passing cloud, dry, wind 4/12
30/04/2018	7-3°C	Passing cloud, dry, wind 3/12
01/05/2018	12-9°C	Light rain, overcast, wind 5/12
12/06/2018	13-11°C	Overcast, dry, wind 2/12
13/06/2018	17-14°C	Passing clouds, dry, wind 5/12
14/06/2018	15-11°C	Cool, dry, wind 2/12
15/06/2018	14-12°C	Scattered clouds, dry, wind 1/12
16/06/2018	14-12°C	Cool, dry, wind 3/12
17/06/2018	16-15°C	Passing clouds, dry, 3/12
18/06/2018	19-14°C	Partly cloudy, dry, 3/12
04/09/18	17-13°C	Mostly cloudy, dry, wind 2/12
05/09/18	15-9°C	Passing clouds, dry, wind 1/12
06/09/18	12-7°C	Mostly clear, light rain, wind 2/12
07/09/18	15-10°C	Scattered clouds, dry, wind 3/12
08/09/18	15-14°C	Mostly cloudy dry, wind 3/12
09/09/18	15-13°C	Mostly cloudy, dry, 3/12

\*Weather data obtained from darksky.net ©2018



### 3 SURVEY LIMITATIONS

#### 3.1 Bat Activity and Automated static detector surveys

3.1.1 Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying bat call loudness and directionality of certain calls. This can result in certain bat species (notably horseshoe bats and long-eared bats) being under-recorded due to the limitations of current available bat detectors. The difference in recording efficiency may therefore bias any results, which has been taken into account where possible during any assessment of the results.

3.1.2 Kaleidoscope Pro automatically identifies bat calls using algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect that there will be certain classification errors related to each classified bat call. With experience of using the software it is, on the whole, reliable when identifying certain bat calls, especially horseshoe bat calls due to their simple and unmistakeable parameters. Other straightforward species are common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula* and serotine *Eptesicus serotinus*. However, the software has been found to be less reliable when identifying other species (long-eared *Plecotus sp.*, **Leisler's** *Nyctalus leisleri* and barbastelle *Barbastella barbastellus* bat species).

3.1.3 Kaleidoscope Pro does not distinguish between the various *Myotis* species and simply classifies them to genus level (i.e. *Myotis sp.*). This is in line with classification that would be achieved by manual identification due to the similar nature of *Myotis* calls making species classification subject to a high degree of error. The on-board software used by the EchoMeter Touch does, however, distinguish between *Myotis* species, but this has been found to be inconsistent.

3.1.4 Due to the software limitations, all calls are manually verified to confirm the identification is accurate. Furthermore, **where the software is unsure of a bat call, it will classify the call as 'NoID'**. For completeness, all NoID files were classified, where appropriate. Noise files were not checked as the vast majority of these cannot be analysed or attributed to bats or their calls.

3.1.5 Additionally, automated detectors are triggered to record when suitable ultrasound is detected and will not cease recording until either a window of 1 second of silence is recorded or 30 seconds elapses, whichever is sooner. If more than one species is present within a recording, the software can only classify one species, so is forced to select **which is 'dominant'**. This **potentially results in an under-recording** of quieter species, long-eared bats, or species with a longer pulse repetition rate.

3.1.6 Overall, the classification data produced by Kaleidoscope Pro, along with manual verification of records, is considered to provide an acceptably accurate record of bat species recorded by static bat detectors and, as such, have been used within this report.

#### 3.2 General

3.2.1 Overnight temperatures during the first static detector deployment consistently dropped below 10°C, which may have resulted in reduced bat activity during these periods. Weather conditions were otherwise favourable for bat activity during the survey.



## 4 RESULTS

### 4.1 Data Search

- 4.1.1 The Phase 1/Baseline Report<sup>3</sup> should be referred to for details of the desk study and data search with the Lincolnshire Environmental Records Centre undertaken to inform baseline conditions for the site. However, the results of the desk study pertaining to bats are repeated in this section.
- 4.1.2 A number of existing records of at least six species of bats were obtained from the records centre, the closest of which were field recordings of unidentified bat species within woodland adjacent to the south east of the site.
- 4.1.3 A number of field records of common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* exist from areas of woodland approximately 1km east of the site. Field records of this species, as well as Daubenton's bat *Myotis daubentonii* exist from Ashbyville Lake, approximately 1.3km south west of the site. Single records of Nathusius' pipistrelle *Pipistrellus nathusii* and Whiskered bat *Myotis mystacinus* occur within Scunthorpe and approximately 1.5km west of the site.
- 4.1.4 Unspecified common pipistrelle and brown long-eared *Plecotus auritus* roosts are also known to be present within the town of Broughton, approximately 1km east of the site.

#### MAGIC search for EPS (bat) Licences

- 4.1.5 Records of previously issued European Protected Species Licences for bats from within 5km of the site were obtained using the MAGIC website. Details of these licences are provided in Table 3 below.

Table 3: MAGIC records of EPS mitigation licences issued within a 2km radius of the site

Licence Ref No.	Species Covered	Dates of Licence	Distance and bearing from Site of Licence Record
2015-7054-EPS-MIT	Bats – Common pipistrelle	2015-2025	1.37km Southeast
EPSM2009-1229	Bats – Soprano pipistrelle	2009-2010	2.35km Northeast
EPSM2010-2663	Bats – Common pipistrelle	2011	4km Northwest
2015-16065-EPS-MIT	Bats – Common pipistrelle	2015-2020	5km Northwest
2015-16065-EPS-MIT-1	Bats – Common pipistrelle	2016-2020	5km Northwest
2015-16065-EPS-MIT-2	Bats – Common pipistrelle	2016-2020	5km Northwest

<sup>3</sup> Baseline Conditions Report – Little Crow Solar, Santon, Lincolnshire (July 2018) Clarkson and Woods.





## 4.2 Survey Results

### *Walked transects*

- 4.2.1 Table 4 below provides a summary of bat species and the total number of bat passes (foraging and commuting combined) recorded during the April, June and September transect surveys. These results are taken from the Echo Meter Touch and iPad Mini 4 recordings.

Table 4: Summary of May and June 2018 transect survey results (no. passes)

Species	23/04/2018 (Spring)	19/06/2018 Summer	04/09/2018 Autumn	Total
Common pipistrelle	89	68	89	246
Soprano pipistrelle	23	8	13	44
Noctule	0	10	8	18
Myotis sp.	0	7	2	9
Total no. passes	112	93	112	317

- 4.2.2 Figure 3 below provides a summary in heatmap form of all bat activity recorded during the transect surveys within the site across each survey season. Heatmaps show the number of bat passes in colour codes on a dark blue to red gradient – the darker blue the colour the fewer bat passes recorded compared to red, which depicts a the highest number of bat passes recorded in that area. Note that these maps do not differentiate between foraging and commuting behaviour.



Figure 3: Heatmap showing total bat activity across all three transects



4.2.3 The highest concentration of bat activity was recorded in the north west of the site, where the habitat comprises woodland edge, a hedgerow and a pond. Another notable concentration of activity can be seen along the northern edge of a wooded shelter belt (known as 'Gokewell Strip') in the centre/east of the site. Very little activity was noted in the centre of the fields away from boundary habitats

4.2.4 The transect surveys indicated that low numbers of generally widespread species are using the site, with common pipistrelle recorded most often. Common pipistrelle call accounted for 77.6% of total bat calls. Soprano pipistrelle was the second-most recorded species, making 13.8% of calls. These were the only two species recorded during the April survey. Noctule and Myotis bat species accounted for 5.7% and 2.8% of calls respectively.

4.2.5 The number of total passes recorded was slightly higher in the April and September surveys than the June survey.

#### Static detector surveys - Field survey results

4.2.6 A total of 2994 bat passes were recorded across all static detectors during both surveys, 210 of which were recorded during the April-May survey, 2072 during the June survey, and 712 passes recorded in September. The following (minimum) five bat species were recorded during the surveys:

- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Noctule *Nyctalus noctula*
- Myotis species *Myotis* sp. (an aggregation of common *Myotis* species is likely to include one or more of *Natterer's bat*, *Daubenton's bat*, *Brandt's bat* *Myotis brandtii* and whiskered bat *Myotis mystacinus*)
- Brown long-eared *Plecotus auritus* (grey long-eared was ruled out as it has only been recorded in southern England and Wales)

4.2.7 Table 5 below provides the results of the static bat detector surveys for each location between April and September 2018. Figure 4 also displays the total number of passes for each species recorded over the duration of the surveys.

Table 5: Results of the static bat detector surveys for each location between April and September 2018

Static location (Figure 2 refers)	Total no. bat species / passes recorded	Species	No. passes	Average No. of Passes per night	% of activity
A	5 species 301 passes 21 Nights (average passes per night = 14.33)	Common pipistrelle	194	9.24	64.45
		Soprano pipistrelle	55	2.62	18.27
		Noctule	28	1.33	9.30
		Myotis	19	0.9	6.31
		Brown long-eared	5	0.24	1.66
B	5 species 452 passes 21 Nights (average passes per night = 21.52)	Common pipistrelle	339	16.14	75
		Soprano pipistrelle	29	1.38	6.42
		Noctule	62	2.95	13.72
		Myotis	18	0.86	3.98
		Brown long-eared	4	0.19	0.88





Static location (Figure 2 refers)	Total no. bat species / passes recorded	Species	No. passes	Average No. of Passes per night	% of activity
C	5 species 517 passes 21 Nights (average passes per night = 24.62)	Common pipistrelle	468	22.29	90.52
		Soprano pipistrelle	33	1.57	6.38
		Noctule	8	0.38	1.55
		Myotis	7	0.33	1.35
		Brown long-eared	1	0.05	0.19
D	5 species 1462 passes 21 Nights (average passes per night = 69.61)	Common pipistrelle	1358	64.67	92.89
		Soprano pipistrelle	53	2.52	3.63
		Noctule	23	1.10	1.57
		Myotis	23	1.10	1.57
		Brown long-eared	5	0.24	0.34
E	5 species 96 passes 21 Nights (average passes per night = 4.57)	Common pipistrelle	69	3.29	71.88
		Soprano pipistrelle	5	0.24	5.21
		Nathusius' pipistrelle	11	0.52	11.46
		Noctule	7	0.33	7.29
		Myotis	4	0.19	4.17
		Brown long-eared	69	3.29	71.88
F	5 species 166 passes 21 Nights (average passes per night = 7.90)	Common pipistrelle	71	3.38	42.77
		Soprano pipistrelle	53	2.52	31.93
		Noctule	13	0.62	7.83
		Myotis	18	0.86	10.84
		Brown long-eared	11	0.52	6.63

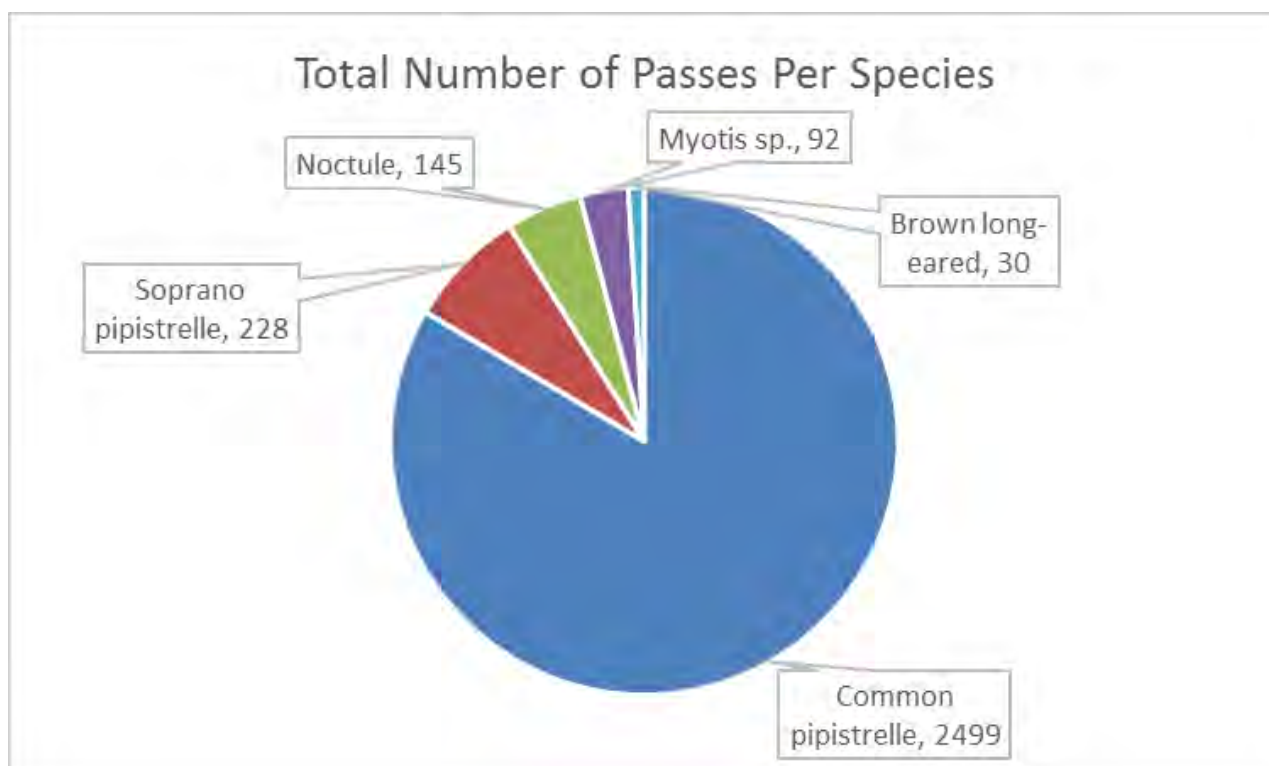


Figure 4: Summary of the species assemblage and total number of passes recorded over the survey period



- 4.2.8 The static detectors recorded a low number of UK native bat species utilising the site (5+ species out of the 11 known resident species in Lincolnshire). It is possible that up to 6 or 7 species use the site, given that *Myotis* species of bat are only classified to a genus level (the *Myotis* assemblage could comprise one of the more frequently encountered species such as whiskered, Daubenton's Natterer's and possibly Brandt's). A total of 2,994 bat passes were recorded throughout the survey period, at an average of 23.76 passes per night per detector. This is considered to represent a relatively low level of bat activity in comparison to numerous sites Clarkson and Woods have undertaken bat surveys at throughout England.
- 4.2.9 As with the manned transect surveys common pipistrelle was found to be the most abundant species, accounting for 83.47% of all passes with an average of 19.83 passes per night. Soprano pipistrelle and noctule were the next most frequently recorded, accounting for 7.62% and 4.84% of passes respectively, with an average of 1.81 and 1.15 passes per night respectively.
- 4.2.10 A total of 92 passes from *Myotis* sp. were recorded during the surveys which equates to an average of 0.73 passes per night and 3.07% of passes overall. A total of 30 brown long-eared calls were recorded at an average of 0.24% per night and accounting for 1% of total bat activity.
- 4.2.11 In terms of bat usage of different areas of the site, the highest levels of bat activity by far were recorded at the western boundary of the site, where a wooded stream corridor is present (Location D). Moderate activity was also recorded at woodland edges in the north of the site (Locations A & B) and at an area of scrub and hedgerow in the middle of the site (Location C). Lower levels of activity were recorded at south east of the site (Location F), with the south western site boundary (Location E) representing the least-used area with less than 5 passes (on average) per recording night.
- 4.2.12 Figure 5 below shows a visual summary of relative bat activity at each detector location

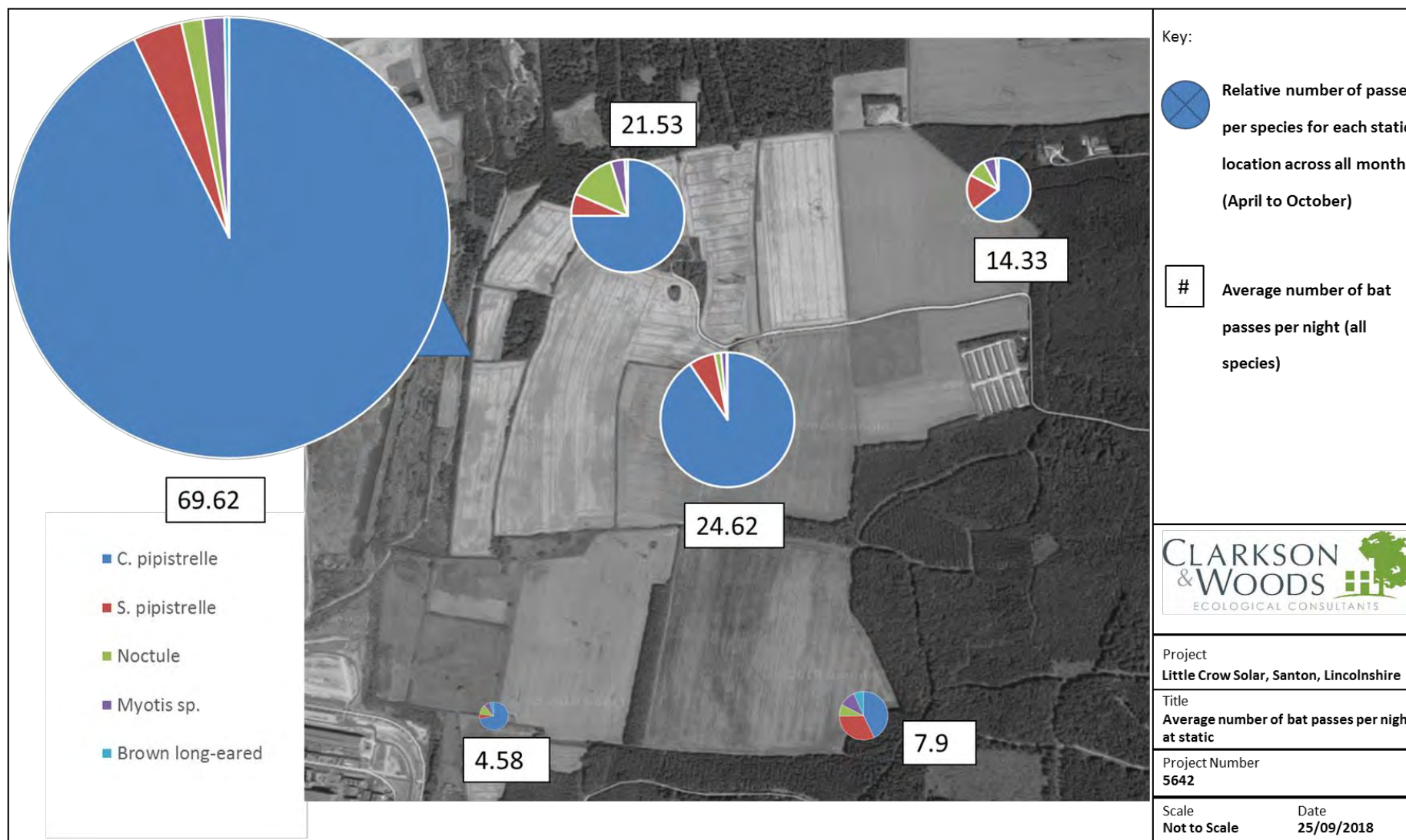


Figure 5: Bat activity at each deployment location



## 5 ECOLOGICAL EVALUATION

- 5.1.1 This section provides an analysis of the value of ecological receptors (bats) identified as occurring within or in proximity of the site. The valuation of the receptor employs the scoring method described by Wray et al<sup>4</sup>, and reflects the rarity and conservation status of each species as well as its relative abundance and activity levels on site.
- 5.1.2 At least 5 species of bat were recorded within the application site during combined surveys. Table 6 below provides the status of each bat species recorded and also the importance of the site to each species based on the combined survey results.

Table 6: Ecological Evaluation

Bat species	UK status (current estimated UK population size) <sup>5</sup>	County status <sup>6</sup>	Level of activity on site	Ecological Importance (Calculated Score {Wray et al. 2010})
Common pipistrelle	Common and widespread (2,430,000)	Common and widespread	Low to moderate activity, likely by a small number of individuals	Local (2+10+3+4 = 17)
Soprano pipistrelle	Common and widespread (1,300,000). UK BAP Priority Species	Common, (but less so than common pipistrelles) and widespread	Low activity, likely by one or two individuals	Site 2+5+3+4 = 14)
Noctule	Fairly common and widespread (50,000). UK BAP Priority Species	Thought to be declining in some areas, although relatively common in the northern half of the county.	Low activity, likely by one or two individuals	Local (5+5+3+4 = 17)
Myotis sp. (exact species recorded unknown)	Daubenton's - relatively common and widespread throughout Britain with a UK estimated population of 560,000 (95,000 in England)	Common and widespread wherever wetland habitat is present	Low activity, likely by one or two individuals	Local 5+5+3+4 = 17
	Natterer's - locally common and widespread throughout Britain with a UK estimated population of 148,000 (70,000 in England)	Local, more common along the western edge of the county		

<sup>4</sup> Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment. In Practice, December 2010. Chartered Institute of Ecology and Environmental Management.

<sup>5</sup> Based on information provided by the Bat Conservation Trust <http://www.bats.org.uk/>

<sup>6</sup> Based on information provided by the Lincolnshire Biodiversity Action Plan (2011) <https://www.nelincs.gov.uk/wp-content/uploads/2016/02/201110-LincolnshireBAP-3rd-edition.pdf>



Bat species	UK status (current estimated UK population size) <sup>5</sup>	County status <sup>6</sup>	Level of activity on site	Ecological Importance (Calculated Score {Wray et al. 2010})
	Whiskered - uncommon but widespread in England, UK population of 64,000	Fairly common and widespread		
	Brant's - uncommon but widespread in England. UK population of 30,000	Not known possibly quite widespread		
Brown long-eared	Common and widespread (245,000). UK BAP Priority Species	Common, with nationally important colonies in the centre and north	Very low activity, likely by one individual	Site (2+5+3+4 = 14)

## 6 SUMMARY

- 6.1.1 In combination, taking all 5+ species together and levels of foraging and commuting activity into account the site is considered to be of Local importance to bats. This is due to the species assemblage present (5+ species out of the 18 resident species in the UK) and the relatively low levels of activity recorded at the site.
- 6.1.2 The woodland edge and hedgerow network across the site have been shown to be of most importance to bats. No bats were recorded within the arable fields during the activity surveys, and it is likely that this habitat offers low quality foraging opportunities.



## 7 RELEVANT LEGISLATION AND POLICY

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2010 (as amended), known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

## PLANNING POLICY IN RELATION TO BIODIVERSITY

The National Planning Policy Framework (NPPF), issued in March 2012, has superseded Planning Policy Statement 9: Biodiversity and Geological Conservation (August 2005). Additional guidance can be found online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. Further guidance is also available within the Government Circular ODPM 06/2005 on Biodiversity and Geological conservation although it should be noted that this document is currently being updated by DEFRA. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 109), including:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 115):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 118) by applying principles including:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and



- the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document: Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

## ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document: Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

In England, the National Planning Policy Framework (NPPF), issued in March 2012, states that the planning system should contribute to "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures". It also states that "opportunities to incorporate biodiversity in and around developments should be encouraged".

## UK BIODIVERSITY ACTION PLANS

The UK Biodiversity Action Plan (UK BAP) 2011 is a policy first published in 1994 to protect biodiversity and stems from the 1992 Rio Biodiversity Earth Summit. The policy is continuously revised to combine new and existing conservation initiatives to conserve and enhance species and habitats, promote public awareness and contribute to international conservation efforts. Each plan details the status, threats and unique conservation strategies for the species or habitat concerned, to encourage spread and promote population numbers.

Species or habitats identified as priorities under the UK Biodiversity Action Plan receive some status in the planning process through their identification as Species/Habitats of Principal Importance in England and Wales, under the Natural Environment and Rural Communities (NERC) Act 2006 (as amended).

Current planning guidance in England, the National Planning Policy Framework, does not specifically refer to Species or Habitats of Principal Importance, though it includes guidance for conservation of biodiversity in general. Supplementary guidance is available online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>, and this guidance indicates that it is 'useful to consider' the potential effects of a development on the habitats or species on the Natural Environment and Rural Communities Act 2006 section 41 list.



Clarkson and Woods Ltd.  
Overbrook Business Centre,  
Poolbridge Road, Blackford,  
Somerset BS28 4PA

t: 01934 712500  
e: [info@clarksonwoods.co.uk](mailto:info@clarksonwoods.co.uk)

[www.clarksonwoods.co.uk](http://www.clarksonwoods.co.uk)



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