



# ARCUS

**ECOLOGICAL IMPACT ASSESSMENT  
COMMON FARM, LAUGHTON COMMON**

**MAY 2022**

**BANKS**Renewables



Prepared By:

**Arcus Consultancy Services**

Suite 13, Evolve Business Centre  
Cygnet Way  
Rainton Bridge South Business Park  
Houghton-le-Spring  
DH4 5QY

**T** +44 (0)191 500 7890 | **E** [info@arcusconsulting.co.uk](mailto:info@arcusconsulting.co.uk)  
**W** [www.arcusconsulting.co.uk](http://www.arcusconsulting.co.uk)

Registered in England & Wales No. 5644976

## TABLE OF CONTENTS

<b>1</b>	<b>SUMMARY</b> .....	<b>1</b>
<b>2</b>	<b>INTRODUCTION AND BACKGROUND</b> .....	<b>2</b>
	<b>2.1 Preliminary Ecological Appraisal</b> .....	<b>2</b>
	<b>2.2 Report Structure</b> .....	<b>3</b>
	<b>2.3 Planning Policy and Legislation</b> .....	<b>3</b>
<b>3</b>	<b>METHODS</b> .....	<b>4</b>
	<b>3.1 Desk Study</b> .....	<b>4</b>
	<b>3.2 Surveys</b> .....	<b>4</b>
<b>4</b>	<b>RESULTS</b> .....	<b>7</b>
	<b>4.1 Great Crested Newt</b> .....	<b>7</b>
	<b>4.2 Birds</b> .....	<b>7</b>
	<b>4.3 Other Species</b> .....	<b>11</b>
<b>5</b>	<b>EVALUATION</b> .....	<b>12</b>
	<b>5.1 Bats</b> .....	<b>12</b>
	<b>5.2 Great Crested Newt</b> .....	<b>13</b>
	<b>5.3 Birds</b> .....	<b>13</b>
	<b>5.4 Other Species</b> .....	<b>17</b>
<b>6</b>	<b>DECOMMISSIONING</b> .....	<b>18</b>
<b>7</b>	<b>CONCLUSIONS</b> .....	<b>18</b>

### **APPENDIX A – PLANNING POLICY AND LEGISLATION**

### **APPENDIX B – FIGURES**

### **APPENDIX C – HABITAT SUITABILITY INDEX (HSI) ASSESSMENT RESULTS**

### **APPENDIX D – GCN PRESENCE/ABSENCE SURVEY RESULTS**

## **1 SUMMARY**

The results of the Preliminary Ecological Appraisal suggest that several protected species have the potential to be negatively affected by the Development in the absence of mitigation. To assess the impacts of the Development and determine the need for and scope of mitigation, further surveys have been conducted for great crested newt and breeding birds.

The surveys recorded no evidence of great crested newt, although common amphibian species were present. The breeding bird survey (BBS) identified a range of bird species typical of the habitats and geographic location of the Site, including 12 species of conservation concern that were breeding or holding territory within the Site.

To reduce the impacts of the Development, species-specific and general mitigation have been recommended. Furthermore, in order to increase the Development's biodiversity value, a range of enhancement measures will be implemented.

## 2 INTRODUCTION AND BACKGROUND

Arcus Consultancy Services Limited (Arcus) was commissioned by Banks Renewables to undertake a Preliminary Ecological Appraisal (PEA) of land to the west of Laughton Common, Dinnington, Sheffield (the 'Site'), centred on National Grid Reference SK 50283 86572, in relation to a Solar Farm with associated infrastructure (the 'Development').

The PEA recommended a range of surveys to provide the necessary information to assess the potential ecological impacts of the Development and to inform the need for, and scope of, mitigation. This Ecological Impact Assessment (EcIA) provides details of these additional surveys and corresponding impact assessment.

### 2.1 Preliminary Ecological Appraisal

The PEA<sup>1</sup> was undertaken in December 2020 and reporting was completed in January 2021, The PEA recorded the following:

#### *Bats*

The Site has habitats and features with the potential to support roosting, commuting and foraging bats. Several trees with potential for roosting bats were identified and should be avoided throughout the Development. On Site habitats were classed as 'low-moderate' suitability for foraging and commuting bats. As habitats of value are to be avoided throughout the Development, no mitigation, or surveys further to those stipulated in the PEA<sup>1</sup> are required.

#### *Great Crested Newt (GCN)*

No ponds are present within the proposed Development footprint. A single pond is present on the northern boundary of the Site and another is present in the centre of the Site. An additional 11 ponds are located within 500 m of the Site. During the desk-study, no records of GCN (*Triturus cristatus*) were returned from within 2 km of the Site since the year 2000. Due to the presence of potential foraging and sheltering opportunities for GCN within the Site and Habitat Suitability Index (HSI) assessment results, further surveys were recommended to determine the presence/likely absence of GCN.

#### *Breeding Birds*

A hedgerow with trees, tall ruderal, arable and grassland field margin habitats within the Site provide good foraging and nesting habitats for birds. Therefore, further surveys were recommended to determine the presence and distribution of breeding bird species to inform the assessment of potential effects. Three barn owl boxes were also located within the Site, offering suitable nesting locations for this species, and further survey or assessment was recommended.

#### *Badger*

No badger (*Meles meles*) setts were recorded on-site or within 30 m of the Site, where accessible. No other evidence of badger was recorded on-site such as footprints, snuffle holes or latrines. The habitats on-site such as: hedgerows, tall ruderal and grassland mosaics were considered suitable to support foraging and commuting badger. In the absence of mitigation, there is potential that the Development will cause harm or disturbance to commuting and foraging badgers (and other terrestrial mammals) during the construction phase of the Development. Controls to safeguard badgers are detailed within the PEA<sup>1</sup>. No further badger assessment is made in this EcIA.

---

<sup>1</sup> Arcus (2020) Preliminary Ecological Appraisal, Common Farm, Laughton Common

### *Reptiles*

Areas of semi-improved grassland, scrub, tall ruderal, hedgerows, and rubble piles on the Site have potential to support basking, foraging and sheltering reptiles. Such habitat will largely be avoided throughout the Development. However, where avoidance is not possible, any clearance works on the Site will be carried out using Reasonable Avoidance Measures (RAMs) as detailed within the PEA<sup>1</sup>. No further reptile assessment is made in this EcIA.

### *Riparian mammals*

Waterbodies within the Site are limited to shallow arable drainage ditches of poor water quality. Aquatic invertebrates and fish are likely absent in significant numbers from the ditches and marginal and aquatic vegetation is limited. Some ditches showed signs of eutrophication associated with fertiliser run off. No field signs were recorded, the ditches were assessed as unsuitable for otter and water vole and they are not considered further within this EcIA.

## **2.2 Report Structure**

This report describes the methods and results of the following surveys:

- GCN presence/absence survey; and
- Breeding bird survey.

The potential impacts of the Development are discussed and recommendations for mitigation and enhancements provided where necessary.

The report is supported by the following appendices:

- Appendix A – Planning Policy and Legislation
- Appendix B – Figures
  - Figure 1: Waterbody Location Map
  - Figure 2a: Breeding Bird Survey Results: Red-listed Species
  - Figure 2b: Breeding Bird Survey Results: Amber-listed Species
- Appendix C – Habitat Suitability Index (HSI) Assessment Results
- Appendix D – GCN Survey Results

## **2.3 Planning Policy and Legislation**

Relevant legislation and policy discussed in the report are summarised in Appendix A.

### 3 METHODS

#### 3.1 Desk Study

A desk study was undertaken as part of the PEA and has been reviewed to inform this report but is not detailed herein.

#### 3.2 Surveys

##### 3.2.1 *Great Crested Newt Surveys*

###### 3.2.1.1 *Environmental DNA (eDNA) Testing*

Based on the HSI assessment completed within the PEAR<sup>1</sup>, eDNA testing of two accessible, suitable ponds (P1 and P2) was undertaken. The method involved a single daytime visit to the waterbodies to determine the presence or absence of GCN.

Water samples were taken in accordance with Natural England's approved method<sup>2</sup> on 22<sup>nd</sup> April 2021 by a GCN licensed ecologist. Twenty water samples were taken from each waterbody; the location of each sample was spaced as evenly as possible using the sterile kits provided by Surescreen. Surveyors used separate sterile gloves and eDNA kits for each waterbody. The samples of the waterbody were subsequently mixed, with 15 ml dispensed into six separate sample tubes which contain 35 ml of ethanol to preserve the eDNA sample. This resulted in a total of six samples for the waterbody. The sample kits were stored at ambient temperature (in the refrigerator) and returned promptly to Surescreen for analysis.

###### 3.2.1.2 *Survey Limitations*

All surveys were undertaken under suitable weather conditions by suitably experienced ecologists, all of whom work in line with the Professional Code of Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Over the course of the GCN surveys, access was not granted to Ponds 4, 6, 7, 8 and 13. Ponds 6, 7, 8 and 13 are located over 250 m from the Site and lack significant connectivity, therefore, the lack of access is considered inconsequential.

Pond 4, located within 250 m of the Site, was not accessible at the time of the initial PEA or during the eDNA survey season. Arcus personnel have not accessed pond 4, however, an assessment of aerial imagery and information provided by the landowner confirms that this waterbody was infilled over a decade ago and is no longer present. Consequently, the lack of access to Pond 4 is no longer considered a limitation to this assessment.

##### 3.2.2 *Bird Surveys and Assessment*

###### 3.2.2.1 *Breeding Bird Surveys*

A Breeding Bird Survey (BBS) was carried out between April and June 2021 to quantify the breeding bird assemblage within the Site and buffer of up to 250 m, where accessible (the BBS Area) (Figure 2a/2b, Appendix B).

The BBS followed a reduced version of the British Trust for Ornithology's (BTO) method for the Common Birds Census (CBC)<sup>3</sup>. The surveyor walked slowly around the BBS Area recording and mapping all species encountered, including behavioural observations where applicable. Survey efforts focused on field margins and hedgerows, with open habitats

---

<sup>2</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. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

<sup>3</sup> Marchant, J. (1983) *Common Birds Census Instructions*. British Trust for Ornithology, Thetford.

searched using binoculars. This is considered the most appropriate method for the predominantly lowland farmland habitats present in the BBS Area.

Surveys were carried out in good weather and lasted for up to 6 hours. Further details of the survey times and weather observations during each visit are provided in Table 3.2.

**Table 3.2: Dates, times, and weather conditions during the BBS**

Date	Start	Finish	Wind*	Cloud**	Other
15.04.2021	05:45	11:45	NNW-NNE, 1-2	2-3	No rain, excellent visibility
19.05.2021	05:15	11:15	WNW, 1-3	3-7	No rain for most of survey, light shower in last hour, excellent visibility
09.06.2021	04:50	10:50	SW, 1-2	1-2	No rain, excellent visibility

\* Direction per 16-point compass, strength per Beaufort Scale. \*\* Recorded in Oktas

### 3.2.2.2 Data analysis

Data analysis focused on identifying breeding territory locations of species of conservation concern, which included any bird species matching one or more of the following criteria:

- Schedule 1-listed species on the Wildlife and Countryside Act 1981 (as amended)<sup>28</sup>;
- Annex I-listed species on the Birds Directive<sup>31</sup>;
- Species of Principal Importance listed on the Natural Environment and Rural Communities (NERC) Act, 2006<sup>30</sup>; and/or
- Red- and Amber-listed birds of conservation concern<sup>4</sup>.

To analyse the data, all registrations of these species were transferred from the field maps to produce 'species summary maps' from which the number and distribution of likely territories for each species could be determined. The method was based on that described by Bibby (2000)<sup>5</sup>, with an element of professional judgement.

For most species, a precautionary approach was taken, and a bird was deemed to be holding territory if it was recorded singing or exhibiting other behaviour indicative of breeding during just one of the three BBS visits or, in some instances, a pair was recorded in apparently suitable breeding habitat. For more mobile species (e.g., waders) a minimum of two registrations in an area, or definitive evidence (e.g., nest or young chicks), was recorded as a territory.

Between the analysis of the BBS data and the submission of the planning application, Birds of Conservation Concern (BoCC) 5 was published<sup>6</sup>. This revised the conservation status of several species recorded at the Site, which are discussed separately.

### 3.2.2.3 Survey Limitations

Outside of the Site boundary, access was restricted to public rights of way; however, observing from these and scanning adjacent areas from within the Site offered good coverage of much of the 250 m buffer area.

The weather conditions were generally good during the BBS visits.

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

<sup>5</sup> Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000). *Bird Census Techniques, 2<sup>nd</sup> edition*. Academic Press, London

<sup>6</sup> Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, 723–747.



The bird breeding season can be protracted and influenced by local and national weather events, species ecology, the annual variation in on-site farming practice, and many other factors. It is inevitable that not all birds will be recorded during every visit and as a result some species may be over- or under-recorded. All survey data was considered and combined with desk-based resources where appropriate. This precautionary approach to analysis aims to provide the most accurate baseline possible with the data available.

Despite the limitations identified, the survey results are considered to be an accurate reflection of the ornithology interest at the Site.

#### *3.2.2.4 Breeding Barn Owl*

The PEA<sup>1</sup> identified suitable barn owl nesting sites, notably three nest boxes targeted toward this species. The farmer was consulted to determine the use of the boxes by barn owl and confirmed that the boxes are already being monitored. The farmer provided the latest results of the monitoring and based on this information, no further surveys were considered necessary.

#### *3.2.2.5 Year-round Bird Assemblage*

Birds are ubiquitous, and some species are likely to be found at the Site throughout the year, while others may use the area during passage or winter periods. No surveys have been carried out during the non-breeding season (approximately September–March) and a habitat-based appraisal is considered sufficient to provide a basis to assess the potential effects of the Development on bird interests during this period.

## 4 RESULTS

### 4.1 Great Crested Newt

#### 4.1.1 Environmental DNA Results

Within the HSI assessment<sup>1</sup>, three ponds achieved a HSI score of 'below average' or above and were accessible for eDNA survey. Ponds 1 and 2 were subject to eDNA analysis, however pond 9 was found to be dry, therefore eDNA was not undertaken.

The results of the eDNA analysis indicated that no GCN eDNA was detected from pond 1 or 2. Results of the sample analysis can be seen in Table 4.1. Whilst GCN were found to be absent, two palmate newts (*Lissotriton helveticus*) were recorded within Pond 2 during survey completion.

**Table 4.1 Results of eDNA analysis**

Pond No.	SureScreen Lab Sample No,	Detection of GCN
1	3084	Negative
2	3086	Negative
9	N/A- Pond Dry	N/A

### 4.2 Birds

#### 4.2.1 Breeding season

A total of 52 species were recorded during the BBS. Of these, 23 were species of conservation concern (as defined in section 3.2.2.2<sup>7</sup>) including 12 that showed evidence of breeding or holding territory within the Site. Breeding and non-breeding species of conservation concern are summarised in Tables 4.2 and 4.3 respectively.

Approximate territory locations of species of conservation concern are shown in Figures 2a and 2b, Appendix B. Territory locations are shown as the approximate mid-point of observations that were used to identify the territory.

**Table 4.2: Summary of Species of Conservation Concern Breeding or Holding Territory during the BBS**

Species*	No. territories or pairs within BBS Area	Summary of observations	Conservation status**
Mallard <i>Anas platyrhynchos</i>	3	Three pairs were considered likely to be breeding in ditch habitats within the Site.	Amber
Grey partridge <i>Perdix perdix</i>	2	Two pairs were recorded in suitable arable habitat in the south of the Site.	Red, S41
Stock dove <i>Columba oenas</i>	7	Seven pairs were considered to be holding territory/breeding within the BBS Area, all within the Site. Territories were centred on mature trees and farm buildings.	Amber

<sup>7</sup> Including Red- and Amber-listed species based on Birds of Conservation Concern 4 (Eaton, *et al.*, 2015)

Species*	No. territories or pairs within BBS Area	Summary of observations	Conservation status**
Lapwing <i>Vanellus vanellus</i>	5	Up to five pairs were recorded within the Site, three pairs in the north, one in the centre, and one in the southeast, all in suitable arable/grassland fields. No chicks seen but behaviour of adult birds during the June survey indicated young birds were present.	Red, S41
Tawny owl <i>Strix aluco</i>	1 <sup>8</sup>	Although not recorded on the BBS, the farmer confirmed a pair nested in a box within the Site.	Amber
Kestrel <i>Falco tinnunculus</i>	1	One pair were recorded, potentially nesting in farm buildings within the centre of the BBS Area.	Amber
Skylark <i>Alauda arvensis</i>	53	A minimum of 53 territories identified, with 43 of these within the Site. The species is found across the majority of the Site in areas of suitable breeding habitat (e.g., grassland and farmland).	Red, S41
Willow warbler <i>Phylloscopus trochilus</i>	4	Restricted to areas of woodland outside the Site. Two territories to the east, and two territories to the southwest of the Site.	Amber
Starling <i>Sturnus vulgaris</i>	2	Two pairs were recorded in industrial buildings to the east of the Site.	Red, S41
Song thrush <i>Turdus philomelos</i>	9	One pair along the southern boundary of the Site in suitable scrub and woodland breeding habitat. Eight pairs considered to be holding territory within woodland and gardens the wider BBS Area.	Red, S41
House sparrow <i>Passer domesticus</i>	29	Estimated count of pairs from four colonies around buildings in the wider BBS Area.	Red, S41
Tree sparrow <i>Passer montanus</i>	6	Estimated count of pairs from one colony in buildings outside the Site, in the wider BBS Area.	Red, S41
Dunnock <i>Prunella modularis</i>	24	Five territories were identified from boundary features (hedgerows and ditches), and areas of woodland and scrub within the Site. The remaining territories were in the wider BBS Area.	Amber, S41
Yellow wagtail <i>Motacilla flava</i>	2	Two pairs were considered likely to be holding territory within the Site, one in the northwest and one in the southeast.	Red, S41
Meadow pipit <i>Anthus pratensis</i>	2	Two pairs in suitable grassland/arable habitat within the Site. Additional birds present in April were considered most likely to be migrants.	Amber

<sup>8</sup> Territory/nest not shown on the figures as there was insufficient information to estimate the location.

Species*	No. territories or pairs within BBS Area	Summary of observations	Conservation status**
Bullfinch <i>Pyrrhula pyrrhula</i>	2	Two likely pairs were identified in hedgerow/woodland habitats the wider BBS Area.	Amber, S41
Linnet <i>Linaria cannabina</i>	15	At least 15 pairs were identified, all but one of these within the Site where the species was found to be utilising ditches, hedgerows, and areas of scrub.	Red, S41
Yellowhammer <i>Emberiza citrinella</i>	34	A minimum of 34 territories were identified, including 30 within the Site. Recorded in hedgerows and ditches/field drains across the BBS Area.	Red, S41
Reed bunting <i>Emberiza schoeniclus</i>	17	A minimum of 17 territories were identified, including 11 within the Site. Recorded in hedgerows and ditches/field drains across the BBS Area.	Amber, S41
<p>*Species nomenclature and taxonomy follows the British List, maintained by the British Ornithologist Union (BOU)<sup>9</sup></p> <p>**Red / Amber = Red- or Amber-listed Birds of Conservation Concern</p> <p>**S41 = Listed on Section 41 of the NERC (2006) Act.</p>			

**Table 4.3: Non-breeding Species of Conservation Concern recorded during the BBS**

Species*	Summary of observations	Conservation status**
Greylag Goose <i>Anser anser</i>	Low numbers were recorded during the April and May surveys from within the Site associating with feral Canada geese. Not considered to be breeding within the BBS Area and likely part of the local feral population.	Amber
Swift <i>Apus apus</i>	Two birds recorded flying over the east of the Site during the June survey was the only record during the survey period.	Amber
Oystercatcher <i>Haematopus ostralegus</i>	One bird flushed from a ditch in the southeast of the Site during the April survey was considered to be a migrant bird.	Amber
Black-headed Gull <i>Chroicocephalus ridibundus</i>	A few records of birds overflying the Site and the wider BBS Area during all survey visits.	Amber
Lesser Black-backed Gull <i>Larus fuscus</i>	One bird flying over the west of the Site during the April survey was the only record.	Amber

<sup>9</sup> <https://www.bou.org.uk/british-list/>

Species*	Summary of observations	Conservation status**
<p>*Species nomenclature and taxonomy follows the British List, maintained by the British Ornithologist Union (BOU).  **Red / Amber = Red- or Amber-listed Birds of Conservation Concern.  **S41 = Species listed on Section 41 of the NERC (2006) Act.</p>		

An additional 29 common bird species (i.e., not species of conservation concern)<sup>10</sup> were recorded during the BBS visits, many of which were recorded breeding, or likely breeding, within the BBS Area.

#### 4.2.2 Birds of Conservation Concern 5

Since the completion of the analysis, BoCC 5 was published and presented an updated assessment of the status of British birds<sup>6</sup>. This elevated several species to red or amber listings and, therefore, consideration within the assessment; however, the following species have not been analysed in detail and are not shown on the BBS results figures.

Moorhen (*Gallinula chloropus*) was not recorded in detail but may breed in small numbers within the ditches and drains that border some fields within the Site. Whitethroat (*Curruca communis*) was abundant in the BBS Area, with a minimum of 18 males singing during the May visit, and likely more than 20 territories overall. The hedgerows and field boundaries offer good breeding habitat for this species; however, these are being retained which will avoid long-term effects.

Wood pigeon (*Columba palumbus*) and wren (*Troglodytes troglodytes*) were not recorded in detail but are now amber-listed species of conservation concern for the importance of the British population in the context of wider European populations. Both species are abundant in the UK with notable population increases recorded since the 1970s, and, given their population status and trend within the UK, including their ubiquity across many areas and regular presence in heavily disturbed habitats, these species are not considered important features.

Rook (*Corvus frugilegus*) was recorded overflying and foraging within the Site, but no nesting colonies were noted. The wheatear (*Oenanthe oenanthe*) that was recorded during the May BBS was a migrant and this species does not breed within the Site. Small numbers of migrant birds of numerous species may opportunistically use the Site on passage; however, there is nothing to suggest the Site offers an important resource for such species, especially in the context of the surrounding area and nearby comparable habitats.

#### 4.2.3 Barn Owl

Barn owl (*Tyto alba*) was not recorded during the surveys; however, due to the typically nocturnal or crepuscular ecology of the species, detecting them was outside the scope of the BBS. The PEA<sup>1</sup> identified three nest boxes targeted toward barn owl and limited areas of potentially suitable foraging habitat within the Site.

The farmer was consulted<sup>11</sup> to determine the use of the nest boxes by barn owl and confirmed the boxes are monitored annually by a local (licensed) bird ringer. The farmer

<sup>10</sup> Green-listed BoCC, not matching the criteria listed in section 3.2.2.2.

<sup>11</sup> By phone, 18<sup>th</sup> May 2021.

confirmed the boxes had been checked in the preceding week and no barn owl were present in any of the boxes.

The boxes have been in situ for 2-3 years, and barn owl have never nested in them. Anecdotally, the farmer does sometimes see barn owl in the wider area, but not during spring 2021. Based on the information provided, it was not considered necessary to check the boxes again or carry out any surveys for barn owl to inform the assessment.

#### **4.2.4 Non-breeding season**

No surveys have been carried out during the non-breeding season and a habitat-based appraisal is considered sufficient to provide a basis to assess the potential effects of the Development on bird interests during this period (approximately September–March).

The desk study returned several records of birds during the non-breeding season; however, the accuracy of many grid references provided make it difficult to know how relevant many of the records are. Nevertheless, it does provide a measure of the bird interests in the region. Many records are typical of the farmland habitats in the area and are consistent with some of the resident species recorded during the BBS. Winter species are included in the dataset, such as fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*) and brambling (*Fringilla montifringilla*).

It is likely that some of the species recorded during the BBS will be present in the area throughout the year, including species of conservation concern such as tree sparrow, linnet and yellowhammer. The hedgerow and woodland habitats are suitable to support migrant species such as fieldfare and redwing.

There are no wetlands in the area and the Site is unlikely to support wildfowl. Aggregations of gulls (*Larus sp.*), lapwing or golden plover (*Pluvialis apricaria*) are feasible, if crop types and timings suit; however, the arable habitats used by these species are widely available in the area and, if these species do occur within the Site, the resources available are unlikely to be important in the context of the wider landscape. No records of golden plover were returned by the desk study

Overall, due to the habitats present and in the context of the wider area, the Site is considered highly unlikely to be important or to hold significant numbers of birds during passage or winter periods. As such, impacts to non-breeding birds during all stages of the Development are expected to be low and not significant, and are not considered further. Proposed enhancement measures (Section 5.3.2.3) will provide improved resources for some bird species in the non-breeding season.

### **4.3 Other Species**

Brown hare (*Lepus europaeus*) were recorded utilising habitats on Site within the initial PEA and throughout the BBS.

## 5 EVALUATION

The Development has the potential to cause the following broad ecological impacts:

- Habitat loss/change during construction and operation;
- Direct harm to, or disturbance of, individuals of species during construction and operations; and
- Legal offences during construction.

The potential ecological effects of these impacts, and the associated mitigation and enhancements, are discussed for each important ecological feature in turn.

### 5.1 Bats

Whilst the Development will not directly harm bats as all linear features will be retained and/ or enhanced and no significant indirect effects are anticipated. Longer term, permanent habitat changes will take place during the operational phase, whereupon all habitats beneath the panels will be converted to grassland. The panels themselves will provide novel structures and change the microclimate; it is probable that these changes will benefit bats by providing a more heterogeneous landscape that supports more prey. Boundary features, such as hedgerows and wildflower meadows, will be created and enhanced, thus providing better foraging resources. Habitat changes during operation will have a significant positive effect on bats at the local level.

Since the initial PEA several trees have been removed by the landowner due to poor tree health posing a health and safety risk. This includes tree numbers: 12, 13 and 18, identified to be of low potential for roosting bat during the PEA<sup>1</sup>. No other trees identified to have potential for roosting bats are scheduled for removal.

The Development will not directly harm bats, but it has the potential to disturb them through changes to exterior night-time lighting. Lighting can affect bats directly, by altering their flight behaviour, or indirectly, by affecting their prey. Lighting during construction will be very limited in extent and duration and no prolonged night-time working is proposed. No fixed lighting is proposed during the operational phase and infrared technology will be used within the security system. Consequently, the limited amount of lighting will have no significant adverse effect on bats. Furthermore, and notwithstanding the limited amount of lighting, the Site will be subject to negligible, if any, night-time disturbance during its operation.

None of above effects are likely to constitute legal offences.

#### 5.1.1 Mitigation and Enhancements

The aims of mitigation are to reduce potential sources of lighting disturbance and to adhere to good practice guidance. Mitigation will include:

- An appropriate lighting strategy will be developed, in line with good practice<sup>12</sup>, for both construction and operation. This is required to minimise light spill and direct light away from high value and boundary habitats such as woodland.
- A minimum of five bat boxes (e.g., Schwegler or similar hardwearing woodcrete-type models) will be installed in the Site to provide enhanced roosting opportunities. Installation will be in accordance with good practice guidelines<sup>13</sup>.

Due to the time elapsed between the initial PEA and construction, any trees to be felled should be subject to an update Preliminary Roost Assessment (PRA). Upon completion of the PRA, further mitigation and/ or additional surveys may be required.

<sup>12</sup> Bat Conservation Trust (2018) *Bats and artificial lighting in the UK*.

<sup>13</sup> Bat Conservation Trust (2019) *Bat Boxes: Putting up your box* [Online] Available at: [http://www.bats.org.uk/pages/bat\\_boxes.html](http://www.bats.org.uk/pages/bat_boxes.html) [Accessed September 2020]

Since the initial PEA several tree numbers 12, 13 and 18 have been removed by the landowner due to poor tree health posing a health and safety risk. No other trees identified to have potential for roosting bats are scheduled for removal. However, due to time elapsed since the initial PEA, any trees scheduled for removal will require an update bat roost assessment prior to felling, dependant on the results of which, further surveys may be required.

## 5.2 Great Crested Newt

GCN were found to be absent from accessible waterbodies within 250 m of the Site, however, common amphibian species (protected under the Wildlife and Countryside Act<sup>28</sup>), including palmate newts were located within on-site waterbodies (outside the Development area). Suitable terrestrial habitat is also present within the Development area.

### 5.2.1 Mitigation and Enhancements

As GCN have been confirmed absent from all waterbodies on-Site and within 250 m, no additional mitigation or enhancement is required. The Site provides suitable habitat for common amphibian species, which should be relocated to a safe area of suitable terrestrial habitat away from the works, if located. Suitable terrestrial habitat includes hedgerows, scrub, tall ruderal vegetation, tussocky grassland, and off-Site ponds. The Development is likely to present a benefit to common amphibian species; through converting arable land to suitable terrestrial habitat.

In the unlikely event that GCN are encountered, all works will stop immediately and the project ecologist will be contacted for further advice. A Natural England licence may be required to facilitate works.

## 5.3 Birds

The results show an assemblage of species typical of the habitats present, and geographic area of the Site. Many species are widespread and/or of low conservation concern; however, priority farmland species, including, but not limited to, grey partridge, lapwing, skylark, linnet, yellowhammer, and tree sparrow, were recorded and are collectively considered an important feature and are the focus of the assessment.

Although direct mortality of birds through collisions with panels has been reported, many incidents occur overseas under very different scenarios to solar developments in the UK, both in terms of development scale and surrounding habitat/landscape. Although there is a recognised lack of research about the ecological impacts of solar farms, there is a general consensus that, within the UK, the risk of harm through collision with panels is very low and this potential effect is not considered further<sup>14,15</sup>.

It is understood that boundary features, such as hedgerow, scrub and woodland within the Site will be retained and enhanced. This will ensure nesting opportunities will continue to be available for some species of conservation concern, such as whitethroat, linnet and yellowhammer. Species such as these forage more widely, and the creation of species-rich grassland within the Site will offset and improve on the resources offered by arable habitats. Such habitats are expected to be suitable for other species recorded, such as grey partridge.

---

<sup>14</sup> Taylor, R., Conway, J., Gabb, O. & Gillespie, J. (2019) *Potential ecological impacts of ground-mounted photovoltaic solar panels*. Available online at: <https://www.bsg-ecology.com/wp-content/uploads/2019/04/Solar-Panels-and-Wildlife-Review-2019.pdf>. [Accessed August 2021]

<sup>15</sup> Natural England (2017) *Evidence review of the impact of solar farms on birds, bats and general ecology 2016 (NEER012)*. Available online at: <http://publications.naturalengland.org.uk/publication/6384664523046912>. [Accessed August 2021]



Habitats within the Site are primarily open, grassland or arable habitats; therefore, species associated with these habitats, such as skylark, will potentially be the most affected by the Development as they use the habitats that are subject to the greatest changes.

Breeding skylark are numerous within the BBS Area but the creation of suitable habitats beneath and between the panels will provide good habitat for foraging, and potentially nesting, even if current evidence of use is mixed<sup>16</sup>. The study by Montag et al. (2016)<sup>17</sup> is widely cited as evidence that skylark do not nest in solar sites; however, the conclusions regarding skylark are unsupported by the evidence presented, and potentially quite misleading. The survey results demonstrate that skylark do use habitats within solar, often in comparable numbers to arable habitats. Skylark nests are very difficult to locate and, as very few nests were found in arable habitats, it is considered likely that, within this study, methodological bias may have influenced the results across all habitats.

Recent research funded by the RSPB has suggested that skylark hold territory and likely nest within many solar developments<sup>18</sup>, highlighting the skylark as one of the most frequently observed species. Similarly, the use of solar Sites by skylark is further supported by recent monitoring by Clarkson & Woods<sup>19,20</sup>, with skylark again among the most commonly recorded species within solar sites. Nests were not searched for or recorded; however, skylark song-flights are most frequently recorded over the nesting territory and this, combined with the frequency of observation, would suggest that some birds do nest within the solar sites. As such, it is expected that with creation and sensitive management of suitable habitats beneath and between the panels, the Site will continue to accommodate skylark. It is unclear whether skylark do nest between panels; however, it is expected that even if nesting inter-row is low, there will be enough space at the ends of the arrays and within the larger gaps, e.g., those included to accommodate over-head cables or underground infrastructure, to support a good skylark population. Although frequently used, winter-sown arable habitats (as present within the Site) are suboptimal for nesting skylark with the advanced maturity of crops in spring limiting breeding success. The consistent habitat offered by the grassland will provide much better foraging opportunities and overall improved productivity for skylark that do nest within the Site post-construction (by facilitating more breeding attempts, per pair), even if the number of territories does decrease a little. Additionally, the habitats created within the Site could also be of wider benefit and offer foraging resource for pairs that nest in adjacent arable fields including Brampton Common LWS, where breeding skylark is a listed feature.

Lapwing are present and bred within the Site during the BBS, although some nesting attempts are likely to have failed. Lapwing breeding success is greater when more pairs are present, as they are better able to detect and/or deter predators. The field where most lapwing were present, and where breeding was most likely successful, has been excluded from development, therefore avoiding most effects as long as the field continues to be farmed in a comparable way to the baseline condition by prioritising spring-sown crops.

Mitigation will be required to minimise direct harm to nesting birds of all species during construction, as detailed in section 5.3.2. As an enhancement, a limited number of nest boxes are recommended and will be targeted toward species of conservation concern, such as tree sparrow. Small, generalist nest boxes are not recommended for this project as it is likely that boxes would primarily be used by blue and great tits. Willow tit and marsh tit

---

<sup>16</sup> Natural England (2016) *Evidence review of the impact of solar farms on birds, bats and general ecology*. Available online at: <http://publications.naturalengland.org.uk/publication/6384664523046912>. [Accessed August 2021]

<sup>17</sup> Montag, H., Parker, G., & Clarkson, T. (2016) *The Effects of Solar Farms on Local Biodiversity; A Comparative Study*. Clarkson and Woods and Wychwood Biodiversity.

<sup>18</sup> <https://community.rspb.org.uk/ourwork/b/biodiversity/posts/bird-use-of-solar-farms-interim-results>. [Accessed August 2021]

<sup>19</sup> Clarkson & Woods. Solarview: Ecological monitoring of solar sites, overview of 2019 surveys. Available online at: [http://www.clarksonwoods.co.uk/wp-content/uploads/2020/07/CW\\_2019-Solarview.pdf](http://www.clarksonwoods.co.uk/wp-content/uploads/2020/07/CW_2019-Solarview.pdf)

<sup>20</sup> Clarkson & Woods. Solarview: Ecological monitoring of solar sites, overview of 2020 surveys. Available online at: <https://www.clarksonwoods.co.uk/wp-content/uploads/PDF/Solarview2020.pdf>

are known from the wider area, both species of high conservation concern, and a factor contributing to their declines is likely to be competition from more dominant tit species<sup>21,22</sup>. As such, it is not considered desirable to artificially increase the populations of blue or great tit within the area.

During the non-breeding season, the change of use from arable farmland may cause a loss of winter foraging opportunities, particularly for granivorous (grain feeding) species. To compensate for this loss, managed bird cover crop should be created and maintained to provide enhanced foraging resources throughout the year, particularly winter.

Overall, with successful implementation of the compensation and enhancement measures recommended, and adherence to the safeguarding measures to protect nesting birds, adverse effects on farmland species of conservation concern at all stages of the Development are expected to be negligible and not significant. Studies suggest that solar sites can support a greater number and diversity of birds than arable habitats<sup>17</sup>, and the recommended enhancements are expected to deliver long-term benefits for birds at the local level.

### **5.3.1 Barn Owl**

No barn owl surveys were carried out, but recent nest box checks and a review of habitats are considered sufficient to identify the baseline condition. In 2021, barn owl did not nest in any of the boxes within the Site, and no potential natural nest locations were identified. Good foraging habitat is limited, and it is considered likely that barn owl is not present regularly within the Site and, as such, no adverse effects are predicted. Creation and maintenance of grassland habitats below and between the panels have the potential to provide improved foraging opportunities for barn owl and offer long-term benefits<sup>23</sup>.

As suitable nesting locations are present within the Site, and barn owl are known from the wider area, it is possible the baseline could change before construction starts. As a Schedule 1-listed species, barn owl is protected from disturbance when nesting. Potential disturbance, particularly during construction, could have an adverse effect on barn owl, and may constitute a legal offence. Therefore, pre-construction surveys are required to update the baseline condition and inform any reactive mitigation which are detailed in section 5.3.2.2.

### **5.3.2 Mitigation and Enhancements**

#### **5.3.2.1 Construction mitigation**

Without mitigation and depending on the time of year that works are carried out, it is possible that construction works will negatively impact breeding birds through direct harm and disturbance, including to nests. Such impacts may also constitute a legal offence.

Mitigation will include, but not be limited to, the following:

- To ensure compliance with the Wildlife and Countryside Act 1981 (as amended)<sup>28</sup>, any work involving vegetation clearance during the peak bird nesting season (March to September) must be avoided where possible or will be subject to pre-construction nest searches.
- If any clearance works to nesting habitats are required during the nesting season, then pre-construction checks for nesting birds would need to be carried out by a suitably experienced ecologist no more than 48 hours prior to the works commencing:

---

<sup>21</sup> Parry, W. & Broughton, R. (2018) Nesting behaviour and breeding success of Willow Tits *Poecile montanus* in north-west England. *Ringling & Migration*, 33:2, 75-85, DOI: 10.1080/03078698.2018.1631610

<sup>22</sup> Back from the Brink, Willow Tit Conservation Handbook. Available online at: <https://naturebftb.co.uk/projects/willow-tit/>

<sup>23</sup> <https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-ground-mounted-solar-panels/>

- If any nesting birds are found to be present, an appropriate buffer zone would be implemented, within which works are excluded, for the duration of the breeding attempt. Any active nests will need to be left in situ until a suitably experienced ecologist confirms that the nesting attempt has reached a natural conclusion.
  - In the unlikely event that any Schedule 1-listed species<sup>24</sup> is suspected of nesting within the Site or immediate surrounds during the construction programme, works will cease and an appropriately experienced ecologist contacted for advice.
  - Given the difficulties in finding nests of some species, such as skylark, it is recommended that the areas where they are known to breed (currently the arable habitats) are harvested as per current practice in the season prior to construction and, if required, the areas are maintained with vegetation a height of no greater than 15 cm to discourage birds from nesting where works are planned, which could result in delays to construction.
- Consideration will be given to mitigation measures for other ecological interests, such as those required to safeguard herptiles detailed within the PEAR<sup>1</sup>. If any potential conflict is identified, works/situation-specific advice can be provided on-site by an appropriately qualified and experienced ECoW.

#### 5.3.2.2 Barn owl

Prior to construction, a check of boxes will be carried out by a licenced ecologist. Depending on the date the construction will start, recent data may be available by the ringer that currently checks the boxes and this should be sought to minimise potential disturbance.

If barn owl are found to be nesting within the Site, mitigation will be based on guidance by Shawyer (2011)<sup>25</sup>. Measures will be location- and situation-specific, but may include an exclusion zone where works are seasonally restricted. The nest will be monitored and any mitigation will be reviewed as necessary to ensure it is effective and proportionate.

No other mitigation or enhancement are proposed for barn owl. The creation of grassland habitats will create an improved foraging resource and may encourage use of the existing boxes.

#### 5.3.2.3 Compensation & Enhancements

Creation of species-rich grassland or meadow habitat beneath and around the panels that will provide undisturbed nesting opportunities for some species, such as skylark, and increased foraging resources for many others, compensating for the loss of arable habitats. This will include use of an appropriate grazing regime or sensitive cut/removal program to promote biodiversity and minimise potential adverse effects. Either method will require a pragmatic and sufficiently detailed management plan to ensure the target habitats are achievable.

If cutting is used, measures may include:

- Management times as to avoid nesting bird season and allow plant species to flower and seed.
- Cuttings should be removed from the Site to help manage nutrient levels.

If grazing is used, measures may include:

- An appropriate stocking rate, which is likely to be substantially lower than on a commercial sheep farm;
- Use of a livestock breed that is well suited to creating and/or managing the target habitats;

<sup>24</sup> <https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wildlife-and-countryside-act/schedules/>

<sup>25</sup> Shawyer, C.R. (2011) *Barn owl Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting*. IIEEM. Winchester.

- The use of temporary infrastructure (e.g., electric fencing) within individual fields to facilitate livestock management and allow increased control of their movement across the Site to maximise habitat/soil condition; and/or
- Seasonal restrictions on grazing to promote biodiversity through limiting nesting bird disturbance and allowing wildflowers to seed.

Creation and management of an areas of managed bird cover crop which will benefit a range of farmland species throughout the year. The areas will offer nesting and foraging resources in the breeding season, and foraging resources in the non-breeding season, particularly for granivorous species such as linnet and yellowhammer and will help to improve.

The area in the north of the Site that has been excluded from the Development infrastructure will continue to be farmed as per during the surveys. Ideally this will include spring-sown crops; however, if this spring cropping is not a viable option, the creation of fallow plots within the field will benefit breeding lapwing.

Bird boxes will be installed on mature trees to provide additional nesting opportunities and will be targeted toward tree sparrow. A minimum of eight bird boxes will need to be installed within suitable locations, and all boxes must be installed in accordance with good practice guidelines<sup>26</sup>. To encourage use by sparrows, boxes will be installed in a single cluster, with several boxes on each, close together and at or above head height<sup>27</sup>.

Provision of two kestrel boxes in suitable locations, as directed by a suitably experienced ECoW or ecologist. These can be located on a tree, pole or building, in undisturbed locations close to grassland and with good visibility. Foraging habitat within the Site will be improved for kestrel, and inclusion of boxes is intended as an enhancement to increase the Site/local population of this amber-listed species. Retention and strengthening of existing hedgerow habitats, and creation of new hedgerows, woodland and scrub will provide bird nesting and foraging opportunities and should include a range of locally suitable native species. These should include berry-bearing species to increase autumn/winter foraging resource.

#### 5.4 Other Species

Several brown hares were recorded utilising on Site habitats, notably the arable crop and open fields. It is anticipated that the Development will change this aspect by creating a structured environment with boundaries. However, there is evidence that this change in habitat can become an advantage to the brown hare, and even be used as a valuable resource. Other solar farms have demonstrated how brown hare use the habitat as a refuge with secure boundaries, which provides the hares with additional feeding and forming opportunities throughout the year. There is anecdotal evidence that brown hare numbers on such sites have increased considerably.

Mitigation proposed for badgers within the PEA<sup>1</sup> will also safeguard brown hare throughout the construction process. Mammal gates should be installed to continue allowing small mammals free range across Site. As such, the Development is considered to be of potential conservation value to brown hare at the local level.

Reptiles and badgers are not included within this EcIA, however mitigation is required, as detailed within the PEA<sup>1</sup>, which should be read in conjunction within this EcIA.

---

<sup>26</sup> <https://www.rspb.org.uk/birds-and-wildlife/advice/how-you-can-help-birds/nestboxes/>

<sup>27</sup> <https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/helping-species/tree-sparrow/>

## **6 DECOMMISSIONING**

It is understood that the farmland habitats within the Site will be maintained until the start of construction and, as such, the baseline condition at the Site is not expected to change substantially between completion of the surveys and the start of construction.

Following the operational phase of the Development, anticipated to be 40 years, the Development will be decommissioned, including the removal of the Site infrastructure. Potential impacts of this work on ecology interests at the Site will likely be similar to those during construction and, prior to decommissioning, it is recommended that the Site is assessed by an ecologist to identify the need for any mitigation or best practice measures, in accordance with prevailing guidance and legislation.

## **7 CONCLUSIONS**

The surveys recommended in the PEA have been carried out confirmed the following:

- The Site supports a range of breeding birds typical of the habitats present.
- GCN were found to be likely absent from the Site and all accessible ponds within 250 m. Common amphibian species are present.

No significant adverse ecological impacts are predicted on the above in the absence of mitigation during construction and operation of the Development. However, to reduce ecological effects and the likelihood of legal offences, species-specific and general avoidance and mitigation measures have been recommended. The BMP sets out a range of habitat creation and enhancements that will provide significant benefits to the ecological features on-Site.

## APPENDIX A – PLANNING POLICY AND LEGISLATION

### The Wildlife & Countryside Act 1981

The Wildlife and Countryside Act 1981<sup>28</sup>, as amended by the Countryside and Rights of Way Act (CROW) 2000<sup>29</sup> and the Natural Environment and Rural Communities Act (NERC) 2006<sup>30</sup>, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive)<sup>31</sup>, making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection; and
- Pick or uproot any wild plant listed under Schedule 8 of the Act. Schedule 9, Part II of the Act also lists many species for which it is an offence to plant, or otherwise cause to grow, in the wild. Any material containing Japanese knotweed is also identified as controlled waste under the Environment Protection Act 1990 and must be disposed of properly at licenced landfill according to the Environmental Protection Act (Duty of Care) Regulations 1991.

### Habitat Regulations 2019 (as amended)

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019<sup>32</sup> (the 'Habitat Regulations') are the principal means by which Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') is transposed into law in England and Wales. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species and makes it an offence to deliberately capture, kill or disturb wild animals protected under the Habitat Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

### Natural Environment & Rural Communities (NERC) Act 2006

The NERC Act 2006<sup>30</sup> places a duty on local planning authorities to have due regard for biodiversity and nature conservation during the course of their operations, and thus ensures that biodiversity is a key consideration in the planning process.

---

<sup>28</sup> Legislation.gov.uk *Wildlife and Countryside Act 1981 (as amended)* [online] Available at: <http://www.legislation.gov.uk/ukpga/1981/69> [Accessed September 2020]

<sup>29</sup> Legislation.gov.uk *The Countryside and Rights of Way Act 2000* [online] Available at: <http://www.legislation.gov.uk/ukpga/2000/37/contents> [Accessed September 2020]

<sup>30</sup> Legislation.gov.uk *Natural Environment and Rural Communities Act 2006* [online] Available at: <https://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed September 2020]

<sup>31</sup> EUR Lex: Access to European Law *Birds Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds* [online] Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147> [Accessed September 2020]

<sup>32</sup> Legislation.gov.uk *The Conservation of Habitats and Species and Planning (Amendment) (EU Exit) Regulations 2019* [online] Available at: <http://www.legislation.gov.uk/ukdsi/2019/9780111176573> [Accessed October 2021]

### **Protection of Badgers Act 1992**

Badgers receive strict protection under the Protection of Badgers Act 1992<sup>33</sup>, which prohibits the taking, injuring, selling, possessing or killing of badgers and makes it an offence to ill-treat any badger, damage, destroy, disturb or cause a dog to enter a badger sett. The 1992 Act defines a badger sett as "*any structure or place, which displays signs indicating current use by a badger*".

### **The Hedgerow Regulations 1997**

The Hedgerow Regulations 1997<sup>34</sup> (as amended by the Hedgerow [Amendment] [England] Regulations 2002; hereafter collectively called the Hedgerow Regulations) were made under Section 97 of the Environment Act in 1995 providing the necessary legislation for the protection of certain hedgerows. The overall aim of the Hedgerow Regulations is to secure the retention of important countryside hedgerows, principally ancient and species-rich hedges. The Hedgerow Regulations also introduced new arrangements for planning authorities in England and Wales to protect important hedgerows in the countryside by controlling their removal through a system of notification.

### **National Planning Policy Framework 2021**

The National Planning Policy Framework (NPPF) 2021<sup>35</sup> sets out the Government's requirement for the planning system in England and in doing so establishes framework within which local planning authorities can develop their own planning policies. The NPPF explicitly addresses the conservation and enhancement of the natural environment, including biodiversity, through paragraphs 179–182.

### **Biodiversity Action Plans**

The UK Biodiversity Action Plan (UKBAP) was developed to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. The UK Post-2010 Biodiversity Framework' now (as of July 2012) succeeds the UKBAP, although the UKBAP priority species and habitats are retained through the NERC Act. Regional and local BAPs have also been organised to develop plans for species/habitats of nature conservation importance at regional and local levels.

---

<sup>33</sup> Legislation.gov.uk *Protection of Badgers Act 1992* [Online] Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents> [Accessed September 2020]

<sup>34</sup> Legislation.gov.uk *The Hedgerow Regulations 1997* [Online] Available at: <http://www.legislation.gov.uk/uksi/1997/1160/contents/made> [Accessed September 2020]

<sup>35</sup> Gov.UK *National Policy Planning Framework 2021* [Online] Available from: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Accessed October 2021]

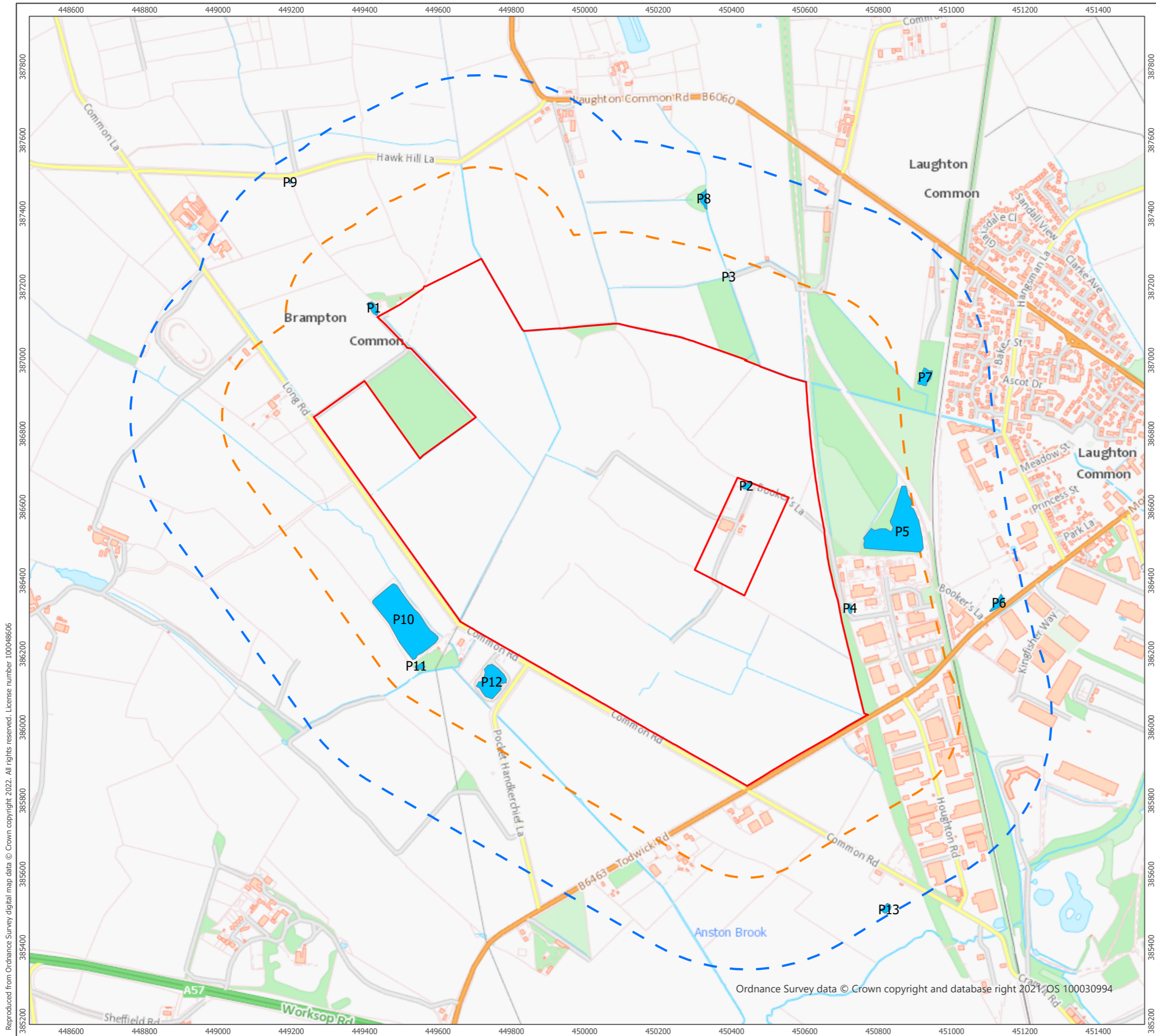
**APPENDIX B – FIGURES**

Figure 1: Waterbody Location Map

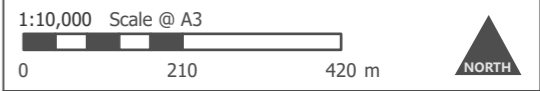
Figure 2a: Breeding Bird Survey Results: Red-listed Species

Figure 2b: Breeding Bird Survey Results: Amber-listed Species





- Site Boundary
- 250 m Site Buffer
- 500 m Site Buffer
- Standing water



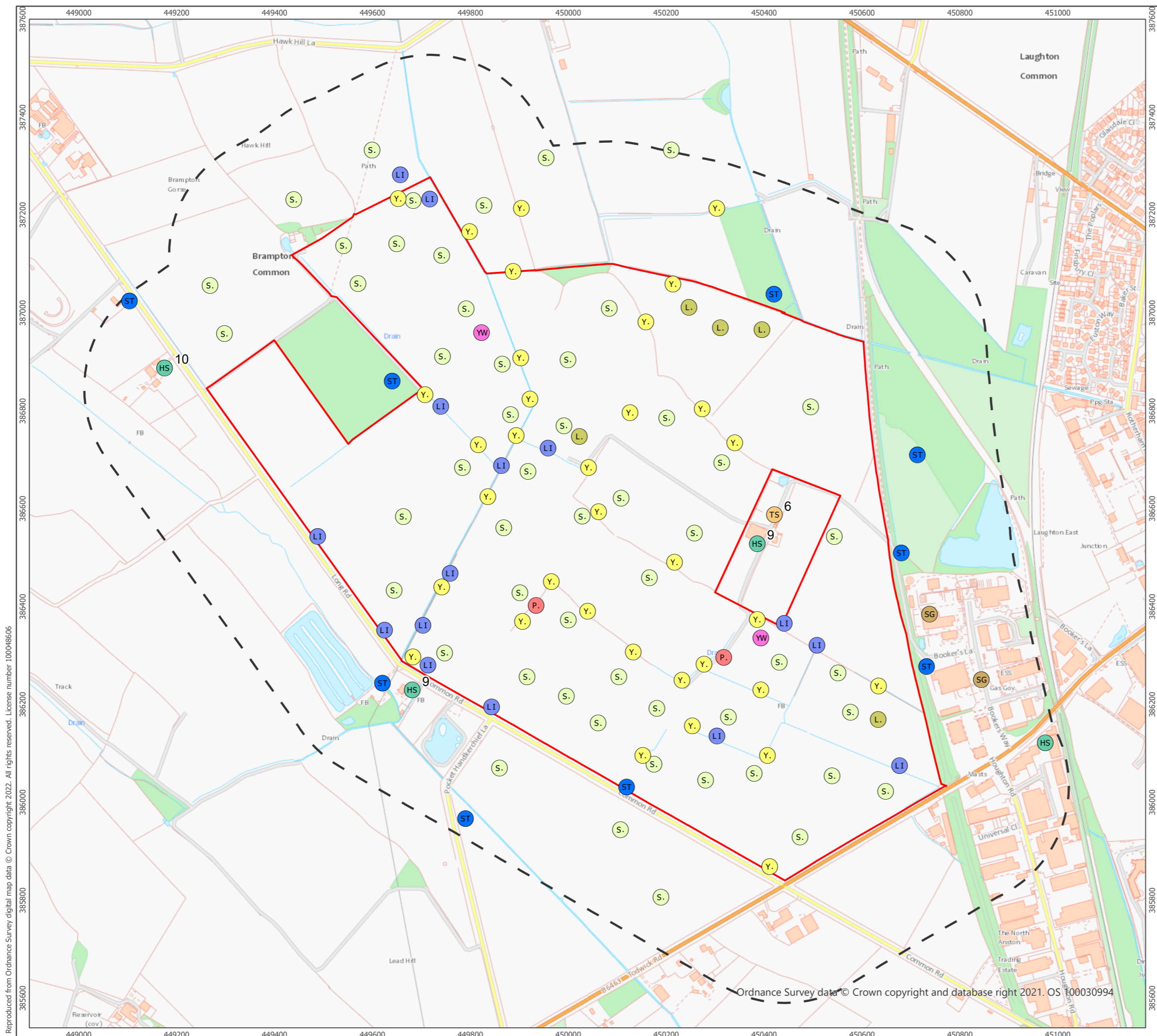
Produced By: HS	Ref: 4124-REP-003
Checked By:	Date: 10/11/2021

**Waterbody Locations Map**  
Figure 1

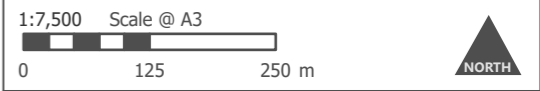
**Common Farm, Laughton Common  
Ecological Impact Assessment**

Reproduced from Ordnance Survey digital map data © Crown copyright 2022. All rights reserved. License number 100048606

Ordnance Survey data © Crown copyright and database right 2021, OS 100030994



- Site Boundary
- 250m Site Buffer
- P Grey Partridge
- HS House Sparrow
- L Lapwing
- LI Linnet
- S Skylark
- ST Song Thrush
- SG Starling
- TS Tree Sparrow
- YW Yellow Wagtail
- Y Yellowhammer



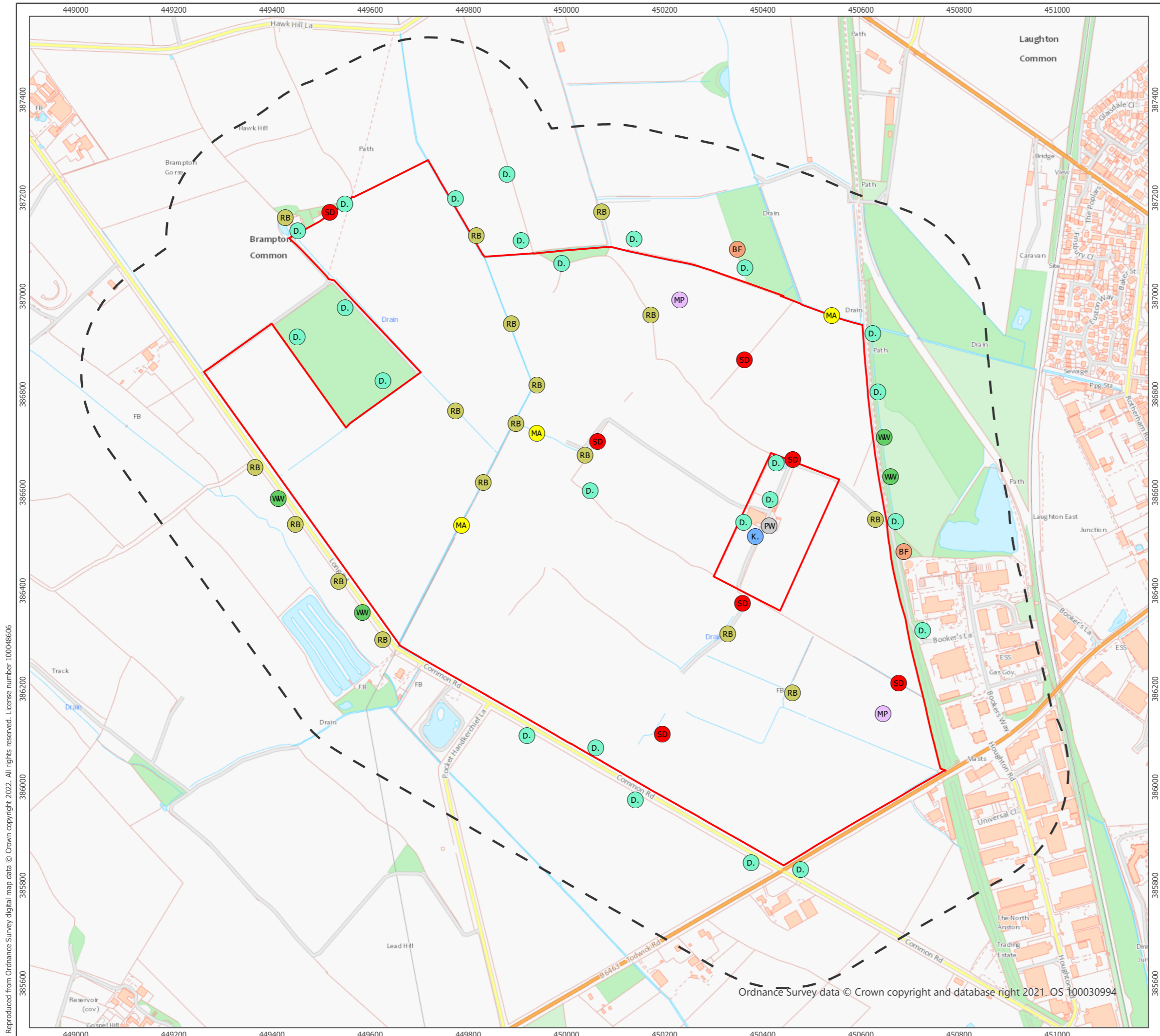
Produced By: KA	Ref: 4124-REP-004
Checked By: MS	Date: 10/11/2021

**Breeding Bird Survey Results:  
Red-listed Species  
Figure 2a**

**Common Farm, Laughton Common  
Ecological Impact Assessment**

Reproduced from Ordnance Survey digital map data © Crown copyright 2022. All rights reserved. License number 100048606

Ordnance Survey data © Crown copyright and database right 2021. OS 100030994



- Site Boundary
- 250m Site Buffer
- Bullfinch
- Dunnock
- Kestrel
- Mallard
- Meadow Pipit
- Pied Wagtail
- Reed Bunting
- Stock Dove
- Willow Warbler



Produced By: KA	Ref: 4124-REP-005
Checked By: MS	Date: 10/11/2021

**Breeding Bird Survey Results:  
Amber-listed Species  
Figure 2b**

**Common Farm, Laughton Common  
Ecological Impact Assessment**

Reproduced from Ordnance Survey digital map data © Crown copyright 2022. All rights reserved. License number 100048606

Ordnance Survey data © Crown copyright and database right 2021. OS 100030994

**APPENDIX C – HABITAT SUITABILITY INDEX (HSI) ASSESSMENT RESULTS**

HSI Parameter	HSI Number	HSI Scores													
		P1	P2	P3	P4	P5	P5	P6	P7	P8	P9	P10	P11	P12	P13
Location	S1	1	1	1	No access	Fishing Pond- Scoped Out	No Access	No access	No access	No access	1	Fishing Pond- Scoped Out	Fishing Pond- Scoped Out	Fishing Pond- Scoped Out	No Access
Pond Area	S2	0.8	0.3	0.1							0.1				
Pond Drying	S3	1	1	0.1							0.1				
Water Quality	S4	0.67	0.67	0.33							0.33				
Shade	S5	0.4	0.9	0.3							1				
Fowl	S6	1	0.67	1							1				
Fish	S7	1	0.67	0.67							1				
Ponds	S8	0.8	0.8	0.8							1				
Terrestrial	S9	0.67	0.67	0.67							1				
Macrophytes	S10	0.2	0.3	0.1							0.3				
<b>Total HSI Score</b>		<b>0.69</b>	<b>0.65</b>	<b>0.36</b>	<b>0.5</b>										
<b>Likelihood of GCN</b>		<b>Average</b>	<b>Average</b>	<b>Poor</b>	<b>Below Average</b>										

---

**APPENDIX D – GCN EDNA SURVEY RESULTS**

Folio No: E9561  
Report No: 1  
Purchase Order: 4124/HS  
Client: ARCHER ECOLOGY  
Contact: HELEN ARCHER

## TECHNICAL REPORT

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

#### SUMMARY

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

#### RESULTS

**Date sample received at Laboratory:** 22/04/2021  
**Date Reported:** 23/04/2021  
**Matters Affecting Results:** None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3084	POND 1 DINNINGTON	SK 49411 87109	Pass	Pass	Pass	Negative	0
3086	POND 2 DINNINGTON	SK 50407 86668	Pass	Pass	Pass	Negative	0

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

**Reported by:** Chris Troth

**Approved by:** Chris Troth



## **METHODOLOGY**

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

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

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

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

## **INTERPRETATION OF RESULTS**

**SIC:**            **Sample Integrity Check** [Pass/Fail]

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

**DC:**            **Degradation Check** [Pass/Fail]

Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

**IC:**            **Inhibition Check** [Pass/Fail]

The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

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

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

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

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

