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COMMERCIAL PROPERTY ADVICE



Preliminary Ecological Appraisal Report

Land East of J11, M40, Banbury

On Behalf Of:

Greystoke CB

Prepared By:

Abigail Lloyd BSc MSc

Harris Lamb | Grosvenor House | 75-76 Francis Road | Edgbaston | Birmingham B16 8SP

Telephone: 0121 455 9455

E-mail: abigail.lloyd@harrislamb.com

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Preliminary Ecological Appraisal Report

Land at East of J11, M40, Banbury

Main Contributors

Issued By

Signature.....  **.....**

Print Name: Abigail Lloyd BSc MSc

Date: 23/02/2022

Approved By

Signature.....  **.....**

Print Name: Rob Harrison BSc MSC MCIEEM

Date: 25/02/2022

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1.0 INTRODUCTION

1.1 Terms of reference

1.1.1 Harris Lamb Property Consultancy (HLPC) was commissioned by Greystoke CB to undertake a Preliminary Ecological Appraisal (PEA) of land located off the A361, Banbury, Oxford, OX16 3AD (national grid reference SP 47787 42194), hereafter termed the 'site'. At the time of undertaking this PEA the site boundary was as shown on Figure 1.

1.1.2 When some surveys were being completed the site boundary included land within the control of the applicant and as such study areas for some surveys were extended beyond the current application area.

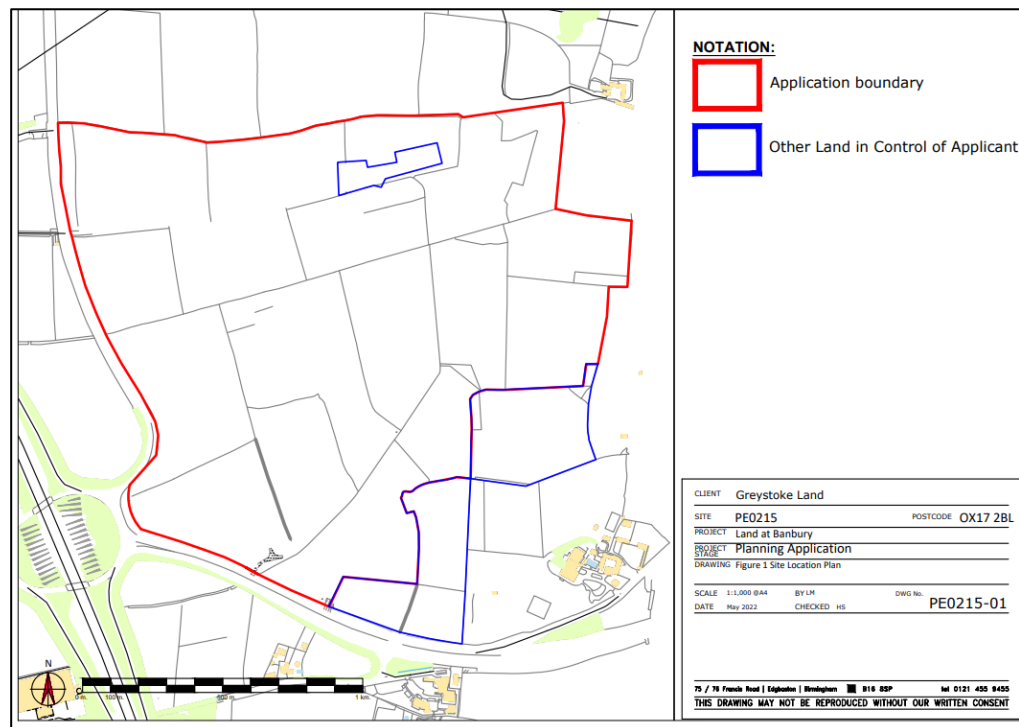


Figure 1: Site location. Not to scale.

1.2 Site location

1.2.1 The site was c. 66 ha in size and is located on the eastern side of the A361, situated c. 2 km northeast of Banbury. The western boundary of the site lies adjacent to the A361 with the southern boundary running adjacent to the A442. The remaining aspects surrounding the site are predominantly agricultural lands dominated by pasture land and arable farmland with a hedgerow network.

1.3 Proposed development

1.3.1 The Applicant is submitting an Outline planning application for the construction of up to 140,000 sqm of Employment floorspace (use class B8 with ancillary offices and facilities) and servicing and infrastructure including new site accesses, internal roads and footpaths, landscaping including earthworks to create development platforms and bunds, drainage features and other associated works including demolition of the existing farmhouse. All matters of detail reserved.

1.4 Purpose of this report

1.4.1 The purpose of this report is to:

- Identify key ecological constraints associated with the proposed development and input into the scheme design to minimise ecological impacts where possible.
- Set out mitigation measures required to ensure compliance with nature conservation legislation and address potentially significant ecological effects.
- Identify how mitigation measures could be secured.
- Provide an assessment of significance of residual effects.
- Identify appropriate enhancement measures.
- Identify appropriate post-construction monitoring if relevant.

2.0 PLANNING CONTEXT

2.1 National Planning Policy Framework (NPPF)

2.1.1 National Planning Policy Framework (NPPF)¹ is the top tier of planning policy. The Framework provides guidance to local authorities and other agencies on planning policy and the operation of the planning system. Section 15 relates to ‘Conserving and enhancing the natural environment’.

2.1.2 Relevant policies in relation to planning application include Paragraph 174:

2.1.3 “Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

2.1.4 179. To protect and enhance biodiversity and geodiversity, plans should:

¹ National Planning Policy Framework (2021) Ministry of Housing Communities and Local Government

a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity⁵⁶; wildlife corridors and steppingstones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

2.1.5 180. When determining planning applications, local planning authorities should apply the following principles:

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

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

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁵⁸ and a suitable compensation strategy exists; and

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

2.2 Relevant local planning policy

2.2.1 Identified relevant local planning policy is summarised in Table 1, overleaf.

Table 1: Summary of biodiversity local planning policy

The Cherwell Local Plan 2011 - 2031 ²	
<p>Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment</p>	<p>Protection and enhancement of biodiversity and the natural environment will be achieved by the following: In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources The protection of trees will be encouraged, with an aim to increase the number of trees in the District The reuse of soils will be sought 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 development will not be permitted. Development which would result in damage to or loss of a site of international value will be subject to the Habitats Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value</p> <p>Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution Planning conditions/obligations will be used to secure net gains in biodiversity by helping to deliver Biodiversity Action Plan targets and/or meeting the aims of Conservation Target Areas. Developments for which these are the principal aims will be viewed favourably A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management.</p>

² <https://www.cherwell.gov.uk/download/downloads/id/8144/final-adopted-local-plan-2011-2031-incorporating-re-adopted-policy-bicester-13.pdf>

Policy ESD 11: Conservation Target Areas	Where development is proposed within or adjacent to a Conservation Target Area biodiversity surveys and a report will be required to identify constraints and opportunities for biodiversity enhancement. Development which would prevent the aims of a Conservation Target Area being achieved will not be permitted. Where there is potential for development, the design and layout of the development, planning conditions or obligations will be used to secure biodiversity enhancement to help achieve the aims of the Conservation Target Area.
Policy ESD 17: Green Infrastructure	The District's green infrastructure network will be maintained and enhanced through the following measures: Pursuing opportunities for joint working to maintain and improve the green infrastructure network, whilst protecting sites of importance for nature conservation Protecting and enhancing existing sites and features forming part of the green infrastructure network and improving sustainable connectivity between sites in accordance with policies on supporting a modal shift in transport (Policy SLE 4: Improved Transport and Connections), open space, sport and recreation (Policy BSC 10: Open Space, Outdoor Sport. and Recreation Provision), adapting to climate change (Policy ESD 1: Mitigating and Adapting to Climate Change), SuDS (Policy ESD 7: Sustainable Drainage Systems (SuDS)), biodiversity and the natural environment (Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment), Conservation Target Areas (Policy ESD 11: Conservation Target Areas), heritage assets (Policy ESD 15) and the Oxford Canal (Policy ESD 16) Ensuring that green infrastructure network considerations are integral to the planning of new development. Proposals should maximise the opportunity to maintain and extend green infrastructure links to form a multi-functional network of open space, providing opportunities for walking and cycling, and connecting the towns to the urban fringe and the wider countryside beyond All strategic development sites (Section C: 'Policies for Cherwell's Places') will be required to incorporate green infrastructure provision and proposals should include details for future management and maintenance.

2.3 Natural Environment and Rural Communities Act

2.3.1 In Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act, which came into force on 1st Oct 2006 requires the Secretary of State to publish “*a list of habitats and species which are of principal importance for the conservation of biodiversity in England*”. This list guides decision-makers such as councils and statutory undertakers, as to their duty under Section 40 of the NERC Act, to “*have regard to the conservation of biodiversity in England*” in day-to-day decisions.

2.3.2 There are currently 56 habitats of principal importance and 943 species of principal importance included on the S41 list. The habitats recorded were

considered against the list of species likely in the site's geographical area and supporting habitats.

3.0 METHODOLOGY

3.1 Study area

3.1.1 The study area is the site boundary shown on Figure 1. The study area was extended beyond the site where appropriate to undertake species-specific appraisals as detailed below. The study area and assessments comply with industry guidance from the CIEEM Guidelines for Preliminary Ecological Appraisal³.

3.2 Desk study

3.2.1 The desktop study was undertaken in June 2021 and included:

- Thames Valley Environmental Records Centre (TVERC),
- Northamptonshire Biodiversity Records Centre (NBRC),
- Multi Agency Geographic Information for the Countryside (MAGIC) website⁴,
- Ordnance Survey (OS)⁵, and
- Aerial imagery⁶.

3.2.2 The geographical extent of the search area for biodiversity information was related to the significance of sites and species and potential zones of influence which might arise from development within the site. For this site the following search areas were considered to be appropriate:

- 10 km around the site boundary for sites of International Importance (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site);
- 2 km around the site boundary for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSI)), protected or otherwise notable species and non-statutory designated sites of County Importance (e.g. Local Wildlife Sites (LWS));
- 1 km for ancient woodland, and

³ CIEEM (2018) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

⁴ www.magic.gov.uk accessed June 2021

⁵ www.bing.co.uk accessed June 2021

- 2 km for biological records.

3.3 Field survey

Flora

3.3.1 In June 2021, HLPC carried out an UK Habitats classification Survey of the site. The survey was carried out by Principal Ecologist Rob Harrison MCIEEM. The survey was undertaken in accordance with guidance from 'UK Habitats Classification methodology⁶ and included identification of flora of importance e.g., rare or vulnerable species as well as invasive non-native species. Survey methodology was completed under licence agreement: © UKHAB LTD, under licence. No onward licence implied or provided. All rights reserved <https://ukhab.org/commercial-eula/>.

3.3.2 The Minimum Mappable Units (MMU) for the survey was set at the standard 25m² and 5m lengths for high value sites.

3.3.3 Specific habitat features were mapped using Target Notes (TN) to record ecological features of particular note where necessary. Site photographs are provided in Appendix 1.

Fauna

3.3.4 The fauna included within this assessment is based on the habitats present, data from the desk-based searches, and the following legislation⁷:

- Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Conservation of Habitats and Species (as amended) 2017;
- The Countryside and Rights of Way Act 2000;
- The NERC Act 2006 – S41 Species of Principal Importance (SPI) for the conservation of biodiversity, and
- Environment Act 2021.

⁶ UK Habitats Classification (<https://ukhab.org/>) [accessed February 2022]

⁷ See www.legislation.gov.uk

Amphibians

- 3.3.5 Waterbodies on site or within 250m of the site boundary, not separated by major barriers to amphibian dispersal, were identified using online Ordnance Survey maps and aerial imagery⁸. These were assessed for their suitability to support great-crested newts *Triturus cristatus* (GCN) using a Habitat Suitability Index (HSI). The HSI is a numerical index, between 0 and 1. Values close to 0 indicate unsuitable habitat, 1 represents optimal habitat (Oldham *et al.*, 2000)⁹.
- 3.3.6 A total of 12 ponds were identified within 250m of the proposed development, with 10 not separated by a potential barrier to amphibian dispersal.
- 3.3.7 A Habitat Suitability Index (HSI) assessment of these 10 ponds were undertaken in line with guidance produced by Oldham *et al* in June 2021. The assessment involved determining the overall quality of the ponds for GCN inhabitancy based on the scoring of ten suitability indices.
- 3.3.8 Subsequent eDNA samples were taken from ponds that met the habitat suitability threshold and where access was permitted. Water environmental DNA (eDNA) samples were taken and were sent for analysis at Sure Screen Scientific, in accordance with methodology approved by Natural England (Biggs *et al.*, 2014¹⁰). Twenty samples were taken from the pond, spaced as evenly where possible around the pond margin, and targeted to areas where there is vegetation which may be being used as egg laying material and open water areas which newts may be using for displaying. Subsequent samples were returned to Sure Screen Scientific for DNA processing. The results of the eDNA analysis are detailed in Appendix 2.

Reptiles

- 3.3.9 An assessment of the suitability of the habitats present to support common reptile species was undertaken. In accordance with current guidance, this assessment involved a review of habitats and habitat structure for suitable

⁸ www.bing.com/maps accessed June 2021

⁹ Oldham *et al.*, 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10, 143-155

¹⁰ Biggs J *et al.*, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

shelter for reptiles such as areas of scrub and woodpiles, grassland with well-developed and varied structure, areas suitable for basking, large tussocks etc.

- 3.3.10 A presence/absence reptile survey using 67 Artificial Cover Objects (ACO's) or refugia according to Froglife guidelines (1999) was undertaken in autumn 2021 by HLPC. ACOs were distributed along areas of vegetation and dense scrub habitat within the site boundaries where reptiles may bask and avoided areas of high cattle activity. The whole site was not covered as the areas of suitable habitat were considered to be limited to areas of lowest impact by grazing cattle which was primarily the eastern site boundary where the land rises with a SW facing aspect and there are areas of shelter habitat for reptiles. The approximate location and distribution of the refugia is shown under Appendix 3.
- 3.3.11 ACOs were constructed of c. 0.5m² sheets using bitumen roofing felt as recommended by Froglife. In addition, natural refugia features already present, i.e., rubble/brick piles and wooden planks, were searched. For areas that were inaccessible the refugia were placed on immediately adjacent where safe to do so.
- 3.3.12 The ACOs were left to 'bed in' for approximately two weeks, after which time seven non-consecutive survey visits were carried out during ideal weather conditions between early September and early October 2021. During each visit, the ACOs were checked visually from a distance to determine whether reptiles were basking on their surface. The artificial refugia were then carefully approached and lifted to check for reptiles sheltering beneath them.
- 3.3.13 Weather during the survey visits was conducive for surveying for reptiles, being dry and warm or mild. Froglife guidelines (1999) recommend ideal temperatures for reptile survey between 9°C and 18°C. Details on the survey timings and weather conditions are given in Table 2.

Table 2: Reptile survey timings and weather conditions.

Date	Time (h)	Weather conditions	Air Temperature °C
06.09.2021	08:26	Dry and clear.	16
09.09.2021	08:14	Dry with 70% cloud.	16
15.09.2021	16:09	Dry with 5% cloud.	18
21.09.2021	08:28	Dry with 50% cloud.	12
24.09.2021	08:35	Dry and clear.	12
28.09.2021	08:41	Dry with 10% cloud.	12
07.10.2021	08:42	Dry with 20% cloud.	14

Birds

- 3.3.14 Bird species identified at the time of survey were noted and nesting birds recorded as seen. An assessment of habitats was undertaken to determine the likely value to breeding and foraging birds.
- 3.3.15 A three-visit breeding bird survey was undertaken by Steve Haynes, a professional ornithologist on behalf of Falco Ecology Ltd. The territory mapping methodology was based on a reduced survey effort of the Common Bird Census (CBC) as described in both Gilbert *et al.*, 1998¹¹ and Bibby *et al.*, 2000¹². The surveys were carried out during the mid-June to early July 2021 period. Details on the survey timings and conditions are given in Table 3 & 4.

Table 3: Breeding bird survey timings.

Visit	Date	Time (h)
1	19.06.2021	05:35 - 08:35
2	30.06.2021	05:15 - 08:00
3	07.07.2021	05:30 - 08:20

Table 4: Breeding bird survey weather conditions.

Visit	Visibility	Wind direction	Wind speed	Rain	Cloud	Air Temperature °C
1	Good	SE	1	Slight rain until 07:00 h	8/8	Not recorded
2	Good	NE	0-1	Nil	8/8	13-15
3	Good	SSW	1-2	Nil	8/8	13-15

- 3.3.16 Birds heard and seen outside the site were recorded to an approximate distance of 100m. Accurate territory counts outside the site were not obtained; however, the data collected provides an indication of what key species are in the vicinity of the site. The direction of travel of the BBS route was reversed on each visit to prevent temporal bias. The survey route followed the site boundary and along hedgerows within the site.
- 3.3.17 At the time of writing this report additional early spring survey visits were being undertaken by Falco Ecology in spring 2022 and data will be submitted as an addendum to the report when completed.

¹¹ Gilbert, G., Gibbons, D.W. & Evans, J. 1998. Bird Monitoring Methods. Royal Society for the Protection of Birds. Pelagic Publishing Limited: Exeter.

¹² Bibby, C.J., Burgess, N.D. & Hill, D.A. 2000. Bird Census Techniques. Second edition. London: Academic Press.

3.3.18 Further survey detail and any limitations can be found in the breeding bird survey report in Appendix 4¹³.

Hazel Dormouse

3.3.19 An assessment of the habitat on and adjacent to the site for suitability to support hazel dormice *Muscardinus avellanarius* was undertaken.

3.3.20 Dormouse surveys were carried out according to best practice guidelines set out in the Dormouse Conservation Handbook (Bright *et al.*, 2006)¹⁴. Nest tube surveys and nut search surveys were undertaken by James Pattenden, MCIEEM of Cotswold Ecology, Natural England dormouse licence holder (licence reference 2016-21635-CLS-CLS). James is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has 16 years of experience in ecological consultancy.

3.3.21 The site was surveyed for the presence of dormouse by installing 115 nest tubes within suitable hedgerow and woodland habitat around the site. Tubes were located approximately 20 m apart and were fixed underneath horizontal branches with entrances facing the centre of the tree. The tubes were located in the most suitable habitat for dormouse and in areas less likely to be interfered with by cattle present in all the fields. A plan of the hedgerows surveyed can be found in the dormouse report provided by Cotswold Ecology in Appendix 5¹⁵.

3.3.22 A nut search for gnawed hazelnuts, characteristic of dormouse presence, was carried out during the survey at the end of September and October 2021. Hazelnuts were collected from the woodland areas on the site. All collected nuts were inspected for the characteristic marks left by dormice, which leave a smooth round opening with teeth marks at an angle to the hole on the nut surface. Details on the survey timings for both survey techniques are given in Table 5.

¹³ Falco Ecology Ltd (2021). Breeding Bird Survey Report FE-019-200-023-400-R-01-V1

¹⁴ Bright, P., Morris, P and Mitchell-Jones, T. (2006). The Dormouse Conservation Handbook (2nd edn). English Nature, Peterborough. ISBN-1-85716-219-6

¹⁵ Cotswold Ecology Ltd (2022). C533 - Huscote Farm, Banbury - Dormouse Survey Report - Rev 0

Table 5: Dormouse survey details and timings.

Survey	Date
Tubes Deployed	09.06.2021
Tube Check 1	29.06.2021
Tube Check 2	21.07.2021
Tube Check 3	24.08.2021
Tube Check 4, nut search	22.09.2021
Tube Check 5, nut search and collection of tubes	28.10.2021

Bats

Tree Assessments

3.3.23 The tree assessments were undertaken from ground level, with the aid of a torch and binoculars, where required. As it is not known which trees will be affected by the Proposed Development at the outline stage further surveys in respect of trees had not been undertaken at the time of writing this report.

Building Assessments

3.3.24 The initial survey identified seven buildings with potential to support roosting bats (see Appendix 1 for site images and Figure 2 for building location map).



Figure 2: Building locations.

3.3.25 Brief architectural descriptions of the buildings are given in Table 6.

Table 6: Brief building descriptions.

Building number	Description
B1	Abandoned farmhouse building with a double pitched roof.
B2	An open fronted single storey brick-built barn with a corrugated roof over timber roof beams.
B3	A double height brick-built barn with a pitched roof clad in corrugated metal to the front and corrugated cement board to the rear over timber trusses.
B4	Building 4 is a single storey open fronted barn constructed from brick in a similar shape and style to Building 2 and forms the eastern wing to the barn complex. The barn contains a metal clad roof over timber trusses.
B5	An open fronted and sided timber framed shed with partial timber walls and a pitched metal clad roof with some missing sections. Internally the shed is open to the roof with no loft area.
B6	A single storey, single pitched lean to canopy with open front and sides with a metal tin roof. The building is located behind the northern gable of building 2.
B7	A large, prefabricated concrete framed open barn with concrete sheet cladding to two walls. The barn contains a corrugated concrete sheet roof with concrete ridge tiles.

3.3.26 An inspection of these buildings, to determine current or previous evidence of bat inhabitancy, was undertaken on 12/05/2021 by HLPC Associate Ecologist Stuart Silver MCIEEM (licence reference 2015-14674-CLS-CLS) and Dr Holly Smith MCIEEM. With reference to guidance contained within the Bat Conservation Trust's (BCT) Good Practice Guidelines, 2nd edition (Collins, 2016), the survey comprised an internal (where accessible) and external inspection of the building using a Clulite torch, ladders, and binoculars where necessary.

3.3.27 The building was searched for signs of roosting bats (i.e., live, or dead bats, guano, feeding remains, staining etc.) and all potential bat roosting locations within the structure were recorded. During the survey Potential Roosting Features (PRF) for bats were recorded following current best practice. On the basis of visual inspection findings, the building was assigned a level of bat roosting potential from the categories negligible, low, moderate, and high.

Automated Static Bat Detector and Transect Surveys

3.3.28 The potential for the site and immediate surrounds to support foraging and commuting bats was also assessed across the whole site with particular regard given to the presence of habitat features such as continuous treelines,

watercourses and hedgerows providing good connectivity across the site and wider landscape.

- 3.3.29 A monthly transect survey was carried out between June and October 2021 by Cotswold Ecology Ltd. Due to late instruction, surveys May survey visits was not able to be carried out. Surveys in June and July were carried out to include the bat breeding period (mid-May to August) and this is not considered a significant constraint to the interpretation of the data.
- 3.3.30 Due to the overall size of the site, the survey area was split into three separate transect routes with all routes walked simultaneously by three experienced ecologists. The transect routes are shown on Figure 3. The surveys targeted habitats and features suitable for foraging and commuting activity, including woodland edges, hedgerows and standing water.
- 3.3.31 The surveyors were equipped with Echo Meter Touch Pro and Elekon Batlogger M bat detectors to listen and view the echolocations of bats during the surveys. The transect routes were walked at a steady pace, during which all visual and audible bat activity was recorded and if required, later analysed using BatSound, Bat Explorer and Kaleidoscope Pro software.



Figure 3: Map of pre-determined transect routes.

3.3.32 Weather conditions during the surveys were considered suitable for bat activity and are shown in Table 7 below. All timings were based on best practice guidelines by Collins, 2016¹⁶.

Table 7: Transect survey timings and weather conditions.

Survey Month	June		July		August		September		October	
Date	10.06.2021		21.07.2021		24.08.2021		22.09.2021		21.10.2021	
Sunset Time (h)	21:24		20:17		20:11		19:04		17:59	
Survey Time (h)	Start	End	Start	End	Start	End	Start	End	Start	End
	21:20	23:33	20:15	22:20	20:11	22:15	19:04	21:05	17:59	20:00
Temperature (°C)	20	19	21	19	16	15	18	16	8	8
Cloud (Octas)	8	8	0	0	1	1	1	1	4	3
Wind (Beaufort)	1	3	1	1	2	2	2	2	2	2
Precipitation	None		None		None		None		None	
General	Warm but overcast with fresh breeze at end of the survey		Very hot week (>30°C in the day)		Light cloud and a gentle breeze		Dry following week of showers		Cold, clear and calm	

3.3.33 Three static detectors were deployed on the site per month in all areas of the site in order to obtain an appraisal of bat activity across the site. Within the areas, locations of the static detectors were chosen based on those locations most likely to be used by foraging and commuting bats and locations where static detectors were able to be deployed without interference from cattle (see Figure 4).

¹⁶ Bat Conservation Trust (BCT) 2016. Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition



Figure 4: Static detector locations.

- 3.3.34 During June and July, two Song Meter (SM) Mini detectors and one SM2 detector were deployed. Following the destruction of the SM2 detector by cattle during the July survey, three SM Mini detectors were deployed in August, September, and October. Recordings made were subsequently analysed using Kaleidoscope Pro software and bat species and the number of passes were identified.
- 3.3.35 The static detector surveys were completed monthly between June and October 2021, between 7 and 12 nights per month. The detectors were programmed to begin recording 30 minutes before sunset and cease recording 30 minutes after sunrise each night. Details on the survey timings and conditions are given in Table 8.
- 3.3.36 Further survey detail and any limitations can be found in the bat survey report in Appendix 6¹⁷.

¹⁷ Cotswold Ecology Ltd (2022). C533 - Huscote Farm, Banbury - Bat Survey Report - Rev 0

Table 8: Static detector survey timings and weather conditions.

Date Deployed	Date Collected	No. of Survey Nights	Nightly Temperature Range (°C)
09.06.2021	17.06.2021	8	09.06.21: 16-21°C 10.06.21: 17-21°C 11.06.21: 12-18°C 12.06.21: 12-26°C 13.06.21: 15-24°C 14.06.21: 10-18°C 15.06.21: 15-28°C 16.06.21: 15-25°C
21.07.2021	01.08.2021	11	21.07.21: 16-28°C 22.07.21: 16-27°C 23.07.21: 15-19°C 24.07.21: 16-19°C 25.07.21: 16-19°C 26.07.21: 18-23°C 27.07.21: 16-18°C 28.07.21: 12-17°C 29.07.21: 15-19°C 30.07.21: 14-15°C 31.07.21: 15-16°C
01.08.2021	13.08.2021	12	01.08.21: 12-18°C 02.08.21: 11-15°C 03.08.21: 14-17°C 04.08.21: 13-19°C 05.08.21: 15-16°C 06.08.21: 13-17°C 07.08.21: 14-17°C 08.08.21: 14-17°C 09.08.21: 13-16°C 10.08.21: 13-20°C 11.08.21: 14-19°C 12.08.21: 16-20°C
08.09.2021	20.09.2021	11	08.09.21: 16-27°C 09.09.21: 17-19°C 10.09.21: 16-19°C 11.09.21: 13-19°C 12.09.21: 13-18°C 13.09.21: 14-18°C 14.09.21: 14-16°C 15.09.21: 11-18°C 16.09.21: 12-21°C 17.09.21: 13-19°C 19.09.21: 13-20°C
21.10.2021	28.10.2021	7	21.10.21: 8-13°C 22.10.21: 8-9°C 23.10.21: 10-12°C 24.10.21: 11-12°C 25.10.21: 10-13°C 26.10.21: 14-15°C 27.10.21: 13-14°C

Nocturnal Surveys (Buildings)

- 3.3.37 The surveys followed guidance produced by BCT (Collins, 2016) and involved up to five surveyors equipped with Echo Meter Touch Pro detectors and positioned strategically around the buildings to capture all possible access/egress points. An infrared capable video recorder and infrared flood light were also used during the surveys as required to provide enhanced coverage of key areas. The camera(s) were positioned to cover key areas during each survey visit to provide enhanced monitoring on surveys after dark when observations by human eye can no longer be made. All camera surveys were recorded with video footage reviewed after the survey to identify potential access and egress of roosting bats. All surveys were led by licenced bat ecologist Stuart Silver MCIEEM, (licence reference 2015-14674-CLS-CLS).
- 3.3.38 The dusk emergence surveys commenced 15 minutes prior to sunset and ceased 90 minutes after sunset and the dawn re-entry surveys commenced 90 minutes prior to sunrise and ceased 15 minutes after sunrise. Details on the survey timings and weather conditions are given in Table 9. These conditions were considered optimal for bat activity.

Table 9: Nocturnal survey timings and weather conditions.

Date	Sunset / Sunrise (h)	Start Time (h)	End Time (h)	Air Temperature (°C)	Weather
28.06.2021	21:30	21:15	23:00	16	Mild, dry, dull, and very overcast.
29.06.2021	04:48	03:00	05:03	13	Dry and overcast with a light breeze.
19.07.2021	21:14	20:59	22:46	25	Dry, calm, and warm with clear skies.
20.07.2021	05:09	03:41	05:24	17	Dry and calm with clear skies.
02.08.2021	20:54	20:39	22:24	16	Cloudy, and cool but dry.

Date	Sunset / Sunrise (h)	Start Time (h)	End Time (h)	Air Temperature (°C)	Weather
03.08.2021	05:30	04:00	05:45	11	Foggy and cool but dry.

Hibernation

3.3.39 Hibernation surveys were undertaken on 13th January 2022 and 15th February 2022 by licenced bat ecologists Stuart Silver and Josh Randhawa. The survey consisted of a visual inspection of features of potential interest to hibernating bats located to the exterior of the farmhouse (B1) and internally and externally to the barn buildings (B2 – B7) (where accessible) for hibernating bats. Searches included inspection of gaps to masonry, gaps around doors and lintels both internally and externally and any other crevice forming features around the building. Inspection was carried out by torch and video endoscope as required with ladders used where required to access identified features.

Badgers

3.3.40 Information relating to badgers is provided in a confidential appendix that accompanies the planning application.

Other notable species

3.3.41 Signs of other notable species were recorded as seen. An assessment of the habitat species-richness and diversity was undertaken to determine the likelihood of the of supporting populations of rare invertebrate assemblages.

Legally controlled species

3.3.42 Evidence of species listed on Schedule 9 of the Wildlife and Countryside Act (1981) as amended were recorded as seen. Signs of other notable species were recorded as seen. An assessment of the habitat structural and botanical diversity of the site was undertaken to appraise the likely value of the site for supporting a range of terrestrial and aquatic invertebrate species.

Scoped out

3.3.43 No watercourse was identified within 30m of the site therefore potential impacts to otters *Lutra lutra*, water vole *Arvicola amphibious* and white-clawed crayfish *Austropotamobius pallipes* were scoped out.

3.4 Assessment methodology

3.4.1 The importance of ecological features and impact assessment methodology is based on CIEEM guidelines for ecological impact assessment in the UK and Ireland¹⁸. Significant effects are defined as “*an effect that either supports or undermines biodiversity conservation objectives for important ecological features*” (CIEEM, 2016). A significant effect does not necessarily equate to an affect so severe that consent for a project should be refused planning permission if they can demonstrate following the mitigation hierarchy (avoid, mitigate, compensate) has been applied as part of the decision-making process. Significant effects are qualified with a scale: international and European, national, regional, metropolitan/county, local or within the zone of influence (defined here as site level).

Determining importance

3.4.2 Determining the importance of identified ecological features is based on CIEEM guidance. Various characteristics contribute to the importance of ecological features including:

- naturalness;
- animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitat diversity;
- habitat connectivity and/or synergistic associations;
- habitats and species in decline;

¹⁸ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

- rich assemblages of plants and animals;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/seminatural vegetation types, including examples of naturally species-poor communities;
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

3.4.3 Geographic context is also considered within a defined geographical context.

- International and European.
- National.
- Regional.
- Metropolitan, County, vice-county, or other local authority-wide area.
- Local (including district or borough context) or within a zone of influence (here termed the site).

3.5 Assessment limitations

3.5.1 The assessment for designated sites is based on site citations provided by the local biological record holder and no visits have been made to designated sites.

3.5.2 Ecological surveys are limited by factors that affect the presence of plants and animals, such as the time of year, weather, migration patterns and behaviour. The initial survey was undertaken in June which is an optimal time of year to undertake botanical surveys and to categorise the habitats present.

3.5.3 UK Habitats Classification survey aimed to characterise the habitat on site and is not intended to give a complete list of plant species present. All surveys capture a snap shot of data recorded on the day.

3.5.4 The UK Habitats Classification survey does not constitute a full botanical survey, or a Phase 2 pre-construction survey that would include accurate GIS mapping for invasive or protected plant species.

- 3.5.5 Any absence of desk study records cannot be relied upon to infer absence of a species/habitat as the absence of records may be a result of under-recording within the given search area.
- 3.5.6 The badger survey was undertaken at an ideal time of year when vegetation had died back, and sett entrances could be easily observed. Access was possible to the majority of the site; however, some mammal paths were unable to be followed entirely due to dense vegetation and areas of cattle grazing restricted safe access in some areas.
- 3.5.7 Bat survey limitations cattle in barn preventing internal deployment of camera during last survey.
- 3.5.8 It was not considered safe to enter the house (B1) due to the building being structurally damaged and dangerous and surveys were limited to external surveys. Dense vegetation around the farmhouse (B1) made survey observations difficult at the southern and western elevations.
- 3.5.9 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for one to two years, assuming no significant considerable changes to the site conditions.
- 3.5.10 This report assumes that construction will commence within 1-2 years of the date of the assessment in accordance with the British Standard 42020:2013 unless otherwise stated.
- 3.5.11 Cattle were grazing the majority of the fields throughout all survey visits and on occasion limited access where surveyors considered it unsafe to work.
- 3.5.12 It was not possible to access P9 outwith the site which are located within private gardens and permission to request access was not granted at the time of survey.
- 3.5.13 Not all hedgerows could be inspected along their full length due to safety concerns with cattle being present on site. However all hedgerows were considered to be largely the same composition based on observations where safe to do so with limited species diversity and frequent management as such the general conditional of hedgerows on site was considered possible to determine.

4.0 RESULTS

4.1 Ecological designations

Internationally designated sites for nature conservation

4.1.1 No internationally designated sites for nature conservation were identified within 10km of the site.

Nationally designated sites for nature conservation designation

4.1.2 No nationally designated sites for nature conservation were recorded within 2km of the Site.

Non-statutorily designated sites for nature conservation designation

4.1.3 Two non-statutorily designated sites were identified within 2km of the Site (Table 10). None were recorded on Site.

Table 10: Non-statutorily designated sites identified within 2km of the site.

Name of Site	Approx. Distance and Direction from the Site	Brief Description
Disused railway west of Chacombe LWS	1.4km north	This is a section of the disused railway that runs east of Banbury has large areas of scrub habitat. Scrub is an uncommon habitat throughout much of Oxfordshire and provides important habitat for birds. The Cherwell Biodiversity Action Plan recognises the importance of scrub as there are especially few areas of scrub in the district. Without management scrub develops into woodland as trees establish which is the case on parts of this site. There are also areas of rough grassland with colourful wildflowers.
Grimsbury reservoir and wood DWS	1.3km west	Grimsbury Reservoir is the largest area of standing water in North Oxfordshire. It is fed by the River Cherwell and used both as a water supply and for sporting activities. There is a walk around two sides of the reservoir accessible for members of the public which link up with the canal towpath. It allows good views of any birds using the waterbody. To the north of the reservoir, there is a small plantation woodland. It is a nature reserve managed by Banbury Ornithological Society Reserve for Thames Water.

4.1.4 Numerous potential Local Wildlife Sites (pLWS) were also identified within 2km during the data search, with the closest being Cherwell Country Park, c. 500m west of the site. Cherwell Country Park includes wet grassland and fen on the floodplain of the River Cherwell. There are also sedge filled ditches and areas of rough grassland along a section of a disused railway.

- 4.1.5 These sites are considered to be of importance to nature conservation up to a district to county level.

Known Priority Habitat

- 4.1.6 Two sections of Priority Habitat were identified on site or adjacent to site using www.magic.gov.uk. One stand of deciduous woodland occurs within the north-eastern corner of site and extends beyond the boundaries. A second area of deciduous woodland lies adjacent to the site boundary on the south-eastern aspect. These sites are considered to be of importance to nature conservation up to Local level.

Ancient woodland

- 4.1.7 No ancient or semi-natural woodlands were identified within 1 km of the site.

Habitats on site

- 4.1.8 The habitats described below are mapped in Figure 5 with Site photographs provided in Appendix 1.

Modified grassland – g4 11 59 75 190 364

- 4.1.9 The majority of the site is comprised of modified grassland (see Figure 5 for habitat map). The grassland is heavily cattle grazed with hedgerows forming the field boundaries. A small number of fields have stands of scattered gorse *Ulex europaeus* scrub and field ponds. Species recorded included perennial rye-grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, daisy *Bellis perennis*, dandelion *Taraxacum officinalis* agg., cock's foot *Dactylis glomerata*, ribwort plantain *Plantago lanceolata*, white clover *Trifolium repens*, common stinging nettle *Urtica dioica*, meadow foxtail *Alopecurus pratensis* and greater stitchwort *Stellaria holostea*. Density of species was recorded at five per m².
- 4.1.10 The grassland on site is classified as g4 (modified grassland) under the primary hierarchy of the UK Habitats Classification with the secondary codes 10 (scattered scrub), 59 (cattle grazed), 75 (active management), 190 (hedgerow with trees) and 364 (natural pond).

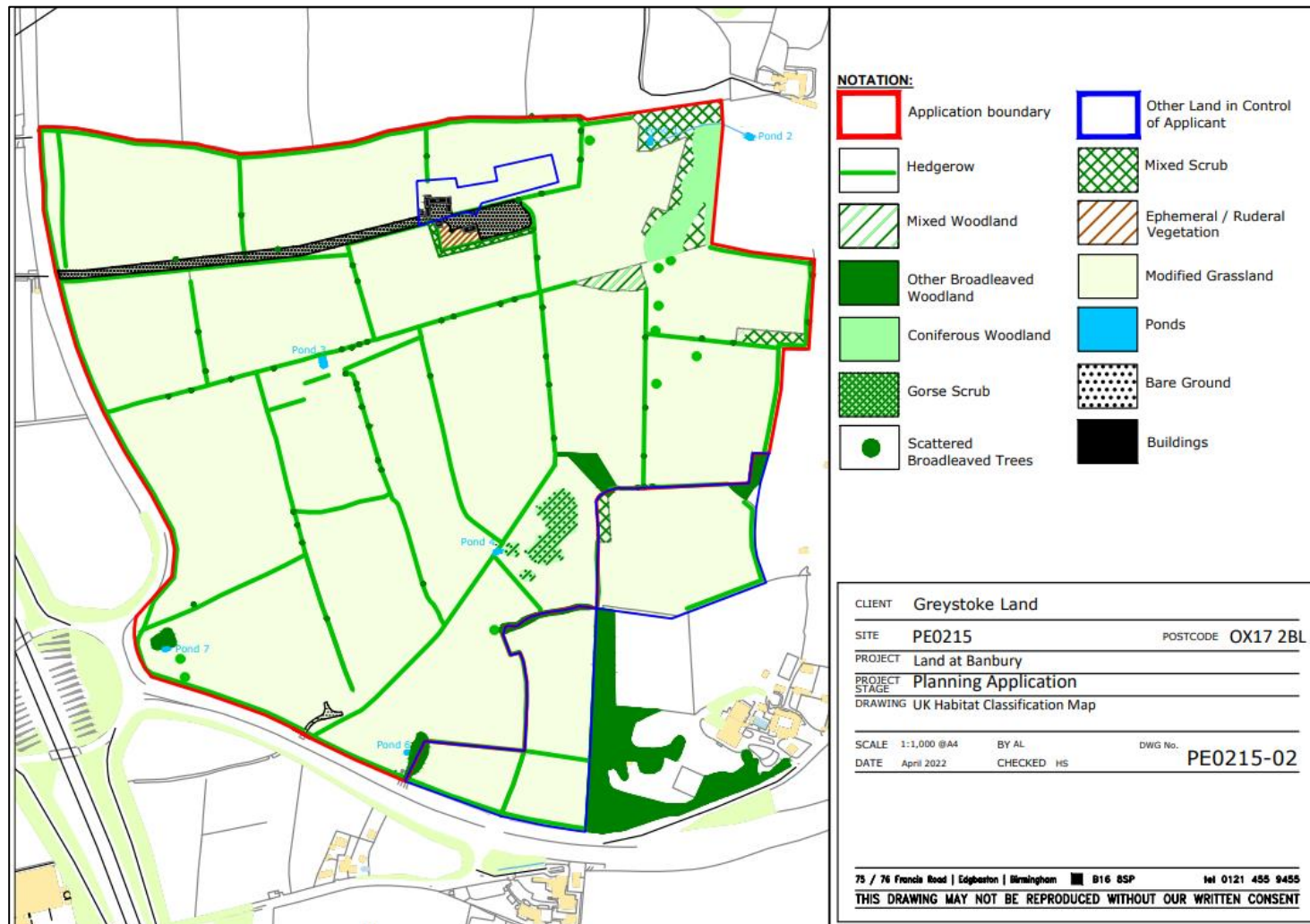


Figure 5: Habitat Map

- 4.1.11 This habitat is widespread both locally and nationally and is considered to be of importance to conservation at the Site level only.

Modified grassland – g4 11 16

- 4.1.12 In association with the farm buildings is a further area of modified grassland but with a different character. This area has grown rank and appears to have been a former garden and contains a large proportion of tall ruderal herbs typically associated with nutrient enrichment, presumably from the use of this area for cattle movements.

- 4.1.13 Species recorded included perennial rye-grass, Yorkshire fog, cock's foot, ribwort plantain, cleavers *Gallium aparine*, common stinging nettle, bramble *Rubus fruticosus* agg. and greater willowherb *Epilobium hirsutum*.

- 4.1.14 This habitat is widespread both locally and nationally and is considered to be of importance to conservation at the Site level only.

Mixed scrub – h3h 10

- 4.1.15 Areas of scrub are present in areas associated with boundaries and field corners.

- 4.1.16 Species recorded include hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, bramble, bracken *Pteridium aquilinum*, White bryony *Bryonia dioica* and guelder rose *Viburnum opulus*.

- 4.1.17 This habitat is widespread both locally and nationally and considered to be of Site level importance to nature conservation.

Scrub – h3e 10

- 4.1.18 Small areas of scattered scrub are present within fields to the eastern part of the site. The scrub is predominantly common gorse *Ulex europaeus*.

- 4.1.19 The scrub on site is classified as h3e (gorse scrub) under the primary hierarchy of the UK Habitats Classification with the secondary codes 10 (scattered scrub).

- 4.1.20 This habitat is widespread both locally and nationally and considered to be of Site level importance to nature conservation.

Hedgerows – h2 47 81 190

- 4.1.21 There are 42 hedgerows present on site, consisting of those forming the site boundaries and those forming internal field boundaries. Some hedgerows on site contain mature trees. Details of all hedgerows on site can be found in Table 11 and locations are shown on Figure 5. Not all hedgerows could be inspected along their full length due to safety concerns with cattle being present on site.
- 4.1.22 Species recorded included Hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, bramble *Rubus fruticosus* agg., holly *Ilex aquifolium*, oak *Quercus robur*, Ash *Fraxinus excelsior* hazel *Corylus avellana*, elder *Sambucus nigra*, *Fagus sylvatica*., holly *Ilex aquifolium*. Hedgerows typically had standard trees, and some were banked. No hedgerow surveyed had greater than five species and as such due to the lack of species diversity recorded within accessible portions and lack of supportive features of hedgerows the hedgerows are not considered to be important hedgerows under the Wildlife and Landscape criteria of Hedgerow Regulations (1997).
- 4.1.23 The linear habitat of hedgerows is classified as h2 (hedgerows) under the primary hierarchy of the UK Habitats Classification with the secondary codes of 47 (native), 81 (managed), and 190 (hedgerow with trees).
- 4.1.24 The hedgerows are considered to qualify as Priority Habitat due to consisting predominantly (i.e., 80% or more cover) of at least one woody UK native species.
- 4.1.25 Collectively the hedgerows on site are considered to be of Site to Local importance for nature conservation, primarily due to the habitat connectivity they provide.

Coniferous Woodland – w2 36 48 77

- 4.1.26 Coniferous woodland is present on site in the north east corner. This is plantation coniferous woodland and consists predominantly of Scot's pine *Pinus sylvestris* and leylandii *Cupressus × leylandii* which has become overgrown with no significant visible ground flora.
- 4.1.27 The coniferous woodland is classified as w2 (coniferous woodland) under the primary hierarchy of the UK Habitats Classification with the secondary codes of 36 (plantation), 48 (non-native) and 77 (neglected).

4.1.28 This habitat is considered to provide limited opportunity for biodiversity due to the monoculture nature of the plantation and dense shading leading to lack of understorey.

4.1.29 This habitat is considered to be of Site level importance to nature conservation.

Mixed Woodland – w1h 36

4.1.30 Mixed woodland is present in the north east corner of the site. Species recorded include Scott's pine, beech, hazel, birch, oak, and horse chestnut.

4.1.31 The mixed woodland is classified as w1h (Other woodland; mixed) under the primary hierarchy of the UK Habitats Classification with the secondary code 36 (plantation).

4.1.32 This habitat is considered to provide good opportunity for biodiversity due to the mix of species present and diversity of habitats this provides within a woodland structure.

4.1.33 This habitat is considered to be of Local level importance to nature conservation.

Other broadleaved Woodland – w1g 37

4.1.34 Several small pockets of broadleaved woodland are also present across the site. Species in these areas include oak, birch, hawthorn, hazel, beech, ash, and horse chestnut.

4.1.35 The broad woodland is classed as w1g (Other broadleaved woodland) under the primary hierarchy of the UK Habitats Classification with the secondary code 37 (semi-natural woodland).

4.1.36 This habitat type is considered of high value for biodiversity and offers good habitat structure for a range of fauna.

4.1.37 This habitat is considered to be of Site to Local level importance to nature conservation.

Buildings – u1b5 88

4.1.38 Buildings on site are associated with the farmhouse and barns to the north of the site. These buildings have been assessed for their potential to support

bats and are discussed fully within Section 4.2 and are scoped out of further habitat assessment.

Bare ground – u1b 69 73 115

4.1.39 Bare ground is present on site associated with access tracks. These areas are considered to offer negligible potential for biodiversity and are not considered further within this report.

Ponds – r1 19 39 362

4.1.40 Twelve ponds were recorded within 250m of the site. Of those five are located within the site boundary, namely Pond 1, 3, 4, 6 and 7 as shown on Figure 6.

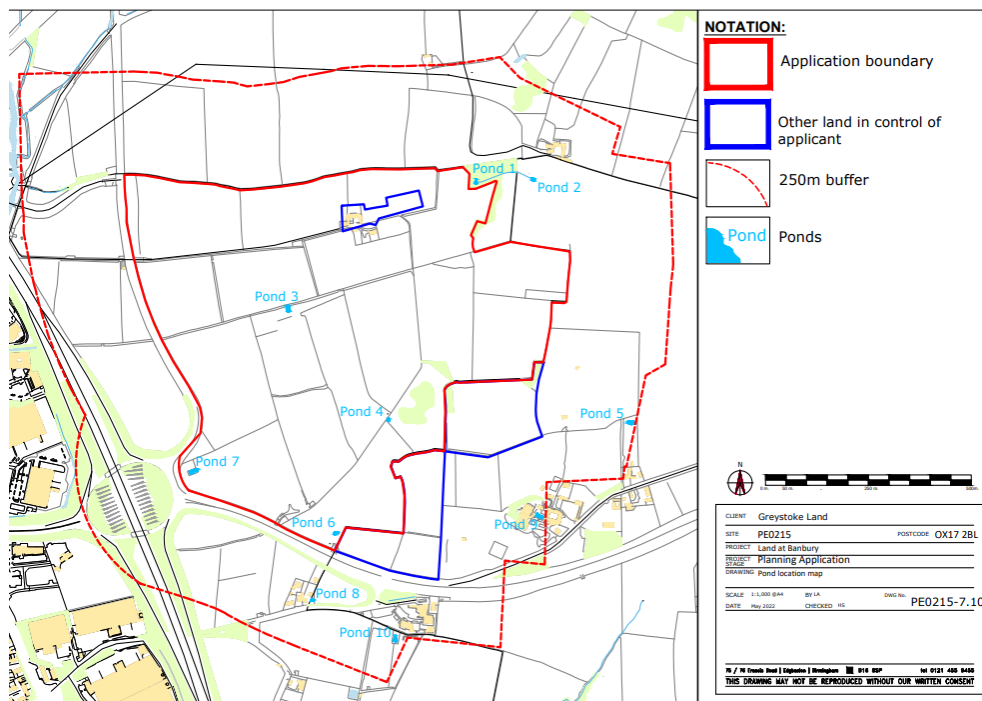


Figure 6: Pond locations

4.1.41 Pond 1 on site held some water at the time of survey and was surrounded and encroached by terrestrial vegetation including creeping bent *Agrostis stolonifera*, nettle *Urtica dioica* and bramble *Rubus fruticosus* agg. It had high algae cover. A small area of open water was surrounded by reed canary grass *Phalaris arundinacea*.

4.1.42 Pond 3 on site was a shallow field pond with surrounding common hawthorn. The pond held minimal water and was very shallow at approximately 10cm deep. The pond showed signs of heavy poaching by cattle. Species present

included perennial rye-grass, creeping bent, floating sweet-grass *Glyceria fluitans* and other species that had encroached from the surrounding modified grassland community.

- 4.1.43 Pond 4 on site was dry at the time of survey and completely encroached and shaded by bramble. It was considered not to typically hold water.
- 4.1.44 Pond 6 on site was a small field pond shaded by hawthorn. The pond was very heavily poached by cattle and heavily churned up with poor water clarity and water quality. The water was approximately 10cm deep and did not contain any aquatic plants other than sparse occurrences of the algae *Cladophora glomerata* agg.
- 4.1.45 Pond 7 on site was another field pond shaded by hawthorn and bramble. The water depth was approximately 0.5m deep. The pond contained a sparse aquatic plant cover, but species included water forget-me-not *Myosotis scorpiodes*, creeping bent, the algae *Cladophora glomerata* agg. and lesser duckweed *Lemna minor*.
- 4.1.46 Ponds on site are classified as r1 (Standing open water and canals) under the UK Habitat Classification with the secondary codes 19 (Ponds (Priority habitat)), 39 Freshwater – man-made) and 362 (Artificial lake or pond).
- 4.1.47 Ponds on site were not considered to qualify as a UK Priority Habitat as they are heavily affected by cattle with low water and high eutrophication and therefore not considered likely to support exceptional assemblages of key biotic groups or species of high conservation importance.
- 4.1.48 Collectively pond habitat within the site is considered to be of Site level importance to nature conservation.

4.2 Species

Amphibians

- 4.2.1 No records of great crested newt were identified by TVERC and NBRC. A single record of common toad *Bufo bufo*, which is a species of principal importance, was identified c. 1.4 km from the site in 2012.
- 4.2.2 The habitats on site were considered suitable for foraging and sheltering opportunities for great crested newt and common amphibians. The mixture of

grassland, hedgerow, scrub, and woodland habitat provides optimal terrestrial habitat for the species.

4.2.3 Twelve ponds were identified within 250m of the site from aerial mapping, five of which lie within the site boundaries (P1, 3, 4, 6 and 7 (see Figure 6). P8 and P10 were removed from consideration as they are separated from site by a major road network, creating a barrier to dispersal. P11 and P12 were no longer present on inspection and were also removed from this assessment.

4.2.4 It was not possible to access P5 which was located within private gardens and permission to request access was not granted at the time of survey. P9 upon review was a swimming pool associated with a school and was scoped out of further assessment.

4.2.5 The remaining six ponds (Ponds 1, 2, 3, 4, 6, and 7) were subject to HSI assessments and subsequent eDNA samples were taken from those that met the habitat suitability threshold, with two ponds considered to have suitability (P1, P7). The HSI results are presented below in Table 11. Pond 2 was completely dry during the amphibian breeding season and P3 and P4 were heavily cattle poached, highly visibly nutrified and very shallow.

Table 11: Habitat Suitability Index results.

ARGUK GCN HSI Calculator							
Pond Name		P1	P2	P3	P4	P6	P7
Grid Ref		SP 48022 42608	SP 48146 42620	SP 47563 42287	SP 47799 42026	SP 47664 41726	SP 47325 41890
SI No	SI Description	SI Value	SI Value	SI Value	SI Value	SI Value	SI Value
1	Geographic location	1	1	1	1	1	1
2	Pond area	0.4	0.2	0.2	0.3	0.5	0.8
3	Pond permanence	0.1	0.1	0.1	0.1	0.1	1
4	Water quality	0.01	0.01	0.01	0.01	0.01	0.67
5	Shade	0.5	0.2	1	0.2	0.3	0.3
6	Water fowl effect	1	1	1	1	1	0.67
7	Fish presence	1	1	1	1	1	1
8	Pond Density	1	1	1	1	1	1
9	Terrestrial habitat	0.67	0.67	0.67	0.67	0.67	0.67
10	Macrophyte cover	0.3	0.3	0.4	0.3	0.3	0.4
HSI Score		0.36	0.31	0.37	0.32	0.35	0.70
Pond suitability (see below)		Poor	Poor	Poor	Poor	Poor	Good
Categorisation of HSI Score by Lee Brady							
HSI Score		Pond Suitability					
< 0.50		Poor					
0.50 - 0.59		Below average					
0.60 - 0.69		Average					
0.70 - 0.79		Good					
> 0.80		Excellent					

4.2.6 Only Pond 7 was considered to have 'good' suitability to support amphibians. All other ponds scored as 'poor' in the assessment. An eDNA sample was taken from Pond 7 and additionally from Pond 1 (as vegetation suggested it would hold water for a good proportion of the year, albeit it was nutrified and

shallow with very limited egg-laying material present). P1 and P7 both returned negative eDNA results which are presented in Appendix 2.

- 4.2.7 Suitable habitat for common amphibians is present on and adjacent to site. No records of great crested newt were identified during the data consultation or 2021 survey effort and based on these data it is not considered likely that great-crested newts will be a receptor with respect to the Proposed Development.
- 4.2.8 The ponds on site, whilst likely to dry out and have signs of high levels of eutrophication, could support populations of common amphibians such as common frog, and common toad and smooth newts. The terrestrial habitats are largely of limited value being heavily grazed by cattle, but hedgerows and areas of woodland and scrub may provide terrestrial habitats for these species at a Site level.
- 4.2.9 Based on these data it is not considered likely that GCN will be a receptor with respect to the Proposed Development but may provide some suitability for common amphibian species at a Site level.

Reptiles

- 4.2.10 One record of grass snake *Natrix helvetica* was identified by TVERC, located c. 750 m west of the site in 2017. Additionally, three records of common lizard *Zootoca vivipara* were identified by TVERC, with the closest record c. 550m west of site.
- 4.2.11 The habitats on site were considered to have some suitability to support reptiles, with areas including gorse scrub, hedgerows and woodland vegetation providing the complex habitat structure typically required by reptiles. In addition, brash piles within various stands of woodland identified on site provide natural hibernacula for the species. Large expanses of the site were considered unsuitable such as the heavily grazed pasture and suitable habitats were generally limited to the site boundaries and field margin hedgerows.
- 4.2.12 Full detail of the reptile survey can be found in Appendix 3. No reptile species were identified during the seven survey visits and the survey results indicate that reptiles unlikely to be a receptor with respect to the Proposed Development.

Birds

- 4.2.13 Multiple records of bird species within 2 km of the site were identified by TVERC and NBRC. Some species recorded are listed on the Birds of Conservation Concern Red List such as cuckoo *Cuculus canorus*, grasshopper warbler *Locustella naevia*, grey wagtail *Motacilla cinerea*, and kittiwake *Rissa tridactyla*. In addition, records of barn owl *Tyto alba*, peregrine *Falco peregrinus*, osprey *Pandion haliaetus*, redwing *Turdus iliacus* and kingfisher *Alcedo atthis* were identified, which are listed on Schedule 1 Part 1 of the Wildlife and Countryside Act 1981. All records were identified within the nearby District Wildlife Site Grimsbury Reservoir and surrounding areas.
- 4.2.14 The pasture fields are considered to be of negligible value to birds of conservation concern with exception of skylark *Alauda arvensis* which was recorded on site but given the high levels of disturbance of grassland habitats by grazing cattle which are rotated around the site, the grassland habitats are considered to be of only limited value to skylark. Habitat features such as hedgerow and wooded areas supported most of the bird species recorded on site and are considered to be of importance to birds at the site level.
- 4.2.15 A total of 43 species were recorded during the 2021 BBS survey. Of these, 17 were species of conservation concern, including ten that showed evidence of breeding or holding territory within the site. Territory holding and non-territory holding species of conservation concern are summarised in Table 12 and Table 13, respectively.

Table 12: Species of conservation concern breeding or holding territory within the site and wider survey area.

Species	Number of territories recorded within site (number within survey area)	Notes
Cuckoo	0(1)	One bird present to the east of the site on Visit 1 of the survey. A probable breeding species given the time of year of the sighting and the presence of suitable host species in the local area.
Stock Dove	9(10)	Commonly recorded within the site with nine territories identified. Pairs were utilising natural nest sites (e.g., in trees) and within farm buildings (e.g., Huscote Farm).
Kestrel	1(1)	An active nest was present within the site. Breeding was confirmed with chicks in the nest.
Skylark	1(1)	One territory in grassland in the west of the site.
Song Thrush	5(5)	Five territories identified from suitable areas (woodland and hedgerow with scattered trees) within the site.
Mistle Thrush	1(1)	One territory within woodland in the south of the site was the only one identified during the survey.
Dunnock	12(16)	Common within the site with 12 pairs considered to be holding territory in areas of scrub, woodland, and hedgerows. Four pairs in the southeast of the survey area outside the site.
Bullfinch	1(1)	One territory in a hedgerow in the centre of the site.
Linnet	3(3)	Three pairs considered to be holding territory in scrub and hedgerow areas within the site.
Yellowhammer	3(3)	Three pairs considered to be holding territory in scrub and hedgerow areas within the south of the site.

Table 13: Species of conservation concern not considered to be holding territory.

Species	Notes
Swift	No swift territories were located within the site or the survey area during the surveys. Small foraging flocks were observed over the site on visits 2 and 3. Likely to be breeding in period properties beyond the survey area.
Little ringed plover	No observations of little ringed plover were recorded within the site during the survey. An observation of a single individual was recorded within the adjacent western field, which appeared to have a sustainable urban drainage systems (SuDS) pond created within it. The bird was present in suitable breeding habitat.
Black-headed gull	Steady streams of birds recorded in flight over the site. Not observed foraging within the site during the surveys. No breeding habitat was present within the site or survey area.
Lesser black backed gull	No territories were located within the site during the survey period. Birds were recorded foraging within the site during the survey period. A peak flock count of 60 birds was recorded on Visit 2, although it was considered that there ~150 individuals within the site on Visit 2.
Red kite	Two records during the survey period. A bird flew west over the site on Visit 2. One flew over the northern survey area on Visit 3. No breeding behaviour was observed during the surveys and limited suitable nesting habitat exists.
Peregrine	One flew south over the site on Visit 1. No breeding habitat was present within the site; however, pylons were present within the northern survey area which are known to provide suitable nesting sites.
Starling	Starlings were not recorded breeding within the site. Suitable nesting habitat was present at Huscote Farm. Post breeding foraging flocks were recorded within the site with a peak count of 35 birds on Visit 3.

4.2.16 A further 26 bird species (not of conservation concern) were recorded, many of which were considered likely to be breeding or holding territory within site and/or surrounds but none were recorded in particularly notable numbers or densities. Further information and a full species list can be found in Appendix 4.

4.2.17 Foraging and nesting birds could be a potential receptor to the proposed development of the site. Nesting bird habitat on site is considered important at Local level only due to the abundance of trees and similar habitat in the local area.

Hazel dormouse

- 4.2.18 No records of hazel dormouse were identified by TVERC and NBRC within 2 km of the site. However, dormice are known to be present within the country of Oxfordshire.
- 4.2.19 The site boundaries support hedgerows that are generally intact and thick but are typically species poor and dominated by hawthorn, blackthorn with bramble and limited areas of hazel. The hedgerows appear to be regularly managed by flailing and are typically short and compact. Whilst hedgerows are species poor and are lacking in habitat structure, they are extensive across the site and the wider landscape and have potential to support a dormouse population with thick hedgerows and connected woodland providing potential nesting and hibernation opportunities.
- 4.2.20 Following surveys conducted by Cotswold Ecology, no dormouse nests were recorded during the nest tube surveys. A small number of nest tubes were occupied by wood mice nests or contained evidence of wood mouse such as food caches. A survey of hazelnuts found during the nut search did not record any evidence of dormouse and the survey results suggest this species is likely to be absent from the site and hazel dormouse are not considered to be a likely receptor to the Proposed Development.

Bats

- 4.2.21 Bat species reported within 2 km of the site by TVERC and NBRC were common pipistrelle *Pipistrellus pipistrellus*, noctule *Nyctalus noctula*, and Daubenton's bat *Myotis daubentonii*. The nearest records is of a noctule bat c. 1.3km west of site at Grimsbury Reservoir and Woods DWS, dated 2010.

Foraging and commuting

- 4.2.22 The site boundaries support hedgerows that are generally intact and thick but managed and generally limited in species richness. However, the hedgerows together with the mature trees, provide good foraging and commuting potential for bats throughout the site.
- 4.2.23 The transect surveys returned a large number of total passes across the survey months, with the most activity recorded in September with 415 passes and the least activity in October with 12. The highest level of activity was recorded by common pipistrelle. No rare bat species, such as barbastelle

Barbastella barbastellus, were recorded on the site during the transect surveys. At least 6 species were recorded during the transect surveys although this number includes *Myotis* bat species and so is likely to be up to 9 species. A summary of the transect survey results are given in Table 14.

Table 114: Summary of transect survey results.

Species	Month and no. of bat passes recorded per species					
	June	July	August	September	October	Total
Common pipistrelle	169	73	127	176	-	545
Soprano pipistrelle	29	40	29	19	10	127
Noctule	54	24	49	173	-	300
Leisler's bat	14	3	27	45	2	91
Brown long-eared bat	2	-	4	2	-	8
<i>Myotis</i> sp.	1	10	5	-	-	16
Total no. of passes	269	150	241	415	12	1087

4.2.24 Most of the hedgerows on the site were used by bats, but that some areas of the site appear to be used more significantly, particularly the areas associated with mature trees. These main areas of bat activity are shown as Areas 1-3 on Figure 7. Area 1 is a hedgerow that has been fenced off from browsing cattle. The hedgerow contains several mature oak trees and connects to woodland in the north-east of the site. Area 1a was particularly active with several transects recording common pipistrelle foraging around the trees at this location. This area also connects hedgerows leading north to south and east to west and so may also be used by bats commuting through the site.

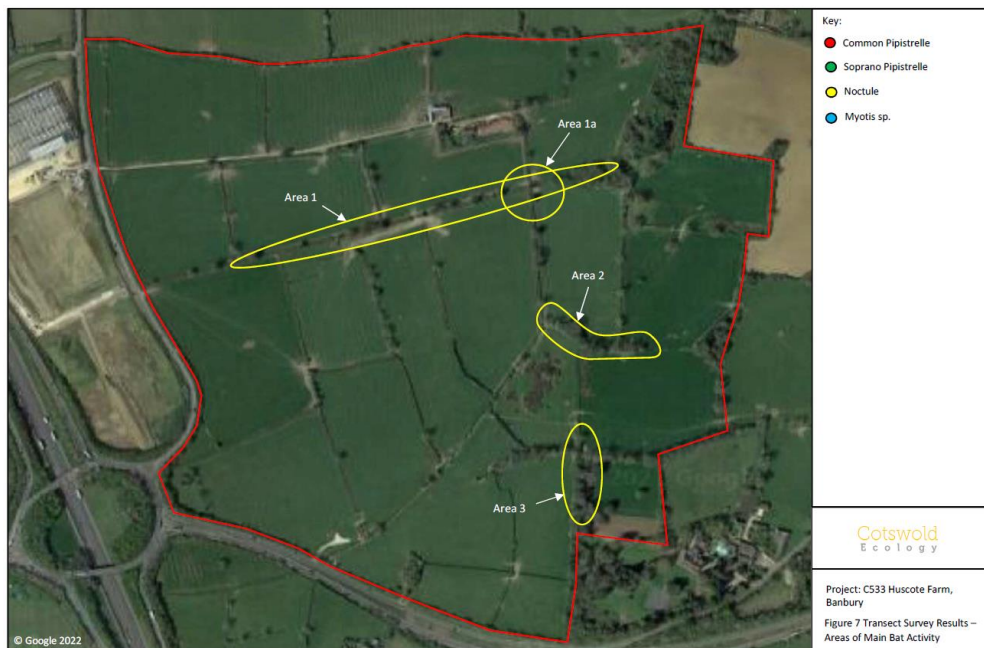


Figure 7: Main bat activity areas during transect surveys.

4.2.25 The static detectors only count bat passes and do not differentiate between commuting and foraging behaviour. As a result, a single bat passing the detector on multiple occasions whilst foraging would result in a spike in the number of passes on a detector, which can account for higher counts on some static detectors. A summary of the static detector surveys are given in Table 15, overleaf.

Table 125: Summary of static detector survey results.

Species	Location	No. of species	Total no. bat passes	Average passes per night
09.06.21 – 17.06.21 (8 nights)	1	6	2262	283
09.06.21 – 17.06.21 (8 nights)	2	7	2236	280
09.06.21 – 17.06.21 (8 nights)	3	7	855	182
21.07.21– 01.08.21 (23 nights)	4	8	16816	732
21.07.21– 01.08.21 (23 nights)	5	5	552	24
08.09.21 – 20.09.21 (11 nights)	8	8	1701	155
08.09.21 – 20.09.21 (11 nights)	9	7	2991	272
21.10.21 – 28.10.21 (7 nights)	10	8	639	91
21.10.21 – 28.10.21 (7 nights)	11	7	1133	162
21.10.21 – 28.10.21 (7 nights)	12	7	511	73
Total			23318	2254

Roosting - Trees

4.2.26 A large number of mature trees are present within hedgerows throughout the site with the majority of mature trees comprising pedunculate oak *Quercus robur* and ash trees. Ground based assessment of mature hedgerow trees found the majority to contain features of potential interest to roosting bats including lifting bark, rot holes, knot holes, woodpecker holes and areas of dead wood and the majority of trees were considered to be of at least low potential to be used by bats and a smaller number considered to be moderate to high. No specific bat activity surveys were undertaken to trees at the time of the assessment as it was not known at the time of survey which would require felling at an outline stage.

Roosting - Buildings

4.2.27 A total of seven buildings were recorded on site comprising a derelict farmhouse with associated barns and outbuildings. Building descriptions are provided in Table 16 overleaf, along with an assessment of their potential to be used by roosting bats.

Table 16: Buildings and associated BRP & PRF details.

Building number	Description	Bat Roost Potential (BRP)
B1	Abandoned farmhouse building with a double pitched roof with front pitch containing concrete tiles and the rear pitch covered in blue slate. The building contains 2 main loft areas within pitched roofs with holes in the front upper floor ceiling observed. The building is missing windows and doors and is open to the elements. The building is rendered/pebble dashed to all sides and there are signs of significant movement and subsidence with large cracks down the front and sides of the structure. The building is structurally compromised and was not considered safe to enter so internal inspection has not been carried out.	High
B2	An open fronted single-story brick-built barn with a corrugated roof over timber roof beams. The building forms the western wing to a horseshoe shaped complex of barns and is split internally by partition walls into 3 rooms. All rooms contain large openings to the front and some to the rear. Internally the roof is open with no loft area.	Moderate
B3	A double height brick-built barn with a pitched roof clad in corrugated metal to the front and corrugated cement board to the rear over timber trusses. The building forms the northern portion of the horseshoe of barns set around an open courtyard area. Internally the building contains a small open mezzanine area to the eastern gable and is open to the roof throughout. The original oak trusses and some original spars are present within. Walls are double thickness brick with a number of arrow slit type windows and the southern roof pitch contains a number of roof light sections. There is a window opening to the upper gable on the western end and a small opening to the upper eastern gable. Gaps are present within internal brickwork; gaps are present between timber lintels and brickwork and a number of gaps are present around windows. Further gaps are likely to be present in mortice joints in the roof trusses.	High
B4	Building 4 is a single story open fronted barn constructed from brick in a similar shape and style to Building 2 and forms the eastern wing to the barn complex. The barn contains a metal clad roof over timber trusses. Features present in and around the building include gaps to brickworks internally, gaps between timber lintels and brickwork and the roof in Building 4 is lined with timber sarking with gaps to the ridge area. Externally, gaps are present to gable verge mortar and gaps are considered likely between the metal roof and wooden sarking.	Moderate
B5	An open fronted and sided timber framed shed with partial timber walls and a pitched metal clad roof with some	Low

	missing sections. Internally the shed is open to the roof with no loft area.	
B6	A single story, single pitched lean-to canopy with open front and sides with a metal tin roof. The building is located behind the northern gable of building 2.	Low
B7	A large, prefabricated concrete framed open barn with concrete sheet cladding to two walls. The barn contains a corrugated concrete sheet roof with concrete ridge tiles.	Negligible

Bat emergence and re-entry surveys 28th and 29th June 2021

- 4.2.28 The initial dusk emergence and dawn re-entry surveys captured frequent commuting activity over the site and foraging activity around the buildings. All surveyors recorded multiple bat passes throughout the survey with common pipistrelle bats, noctule and brown long-eared bat most frequently recorded. Soprano pipistrelle bats were recorded rarely. Surveyor locations can be seen in Figure 8.
- 4.2.29 Several brown long-eared bats were identified entering B3 during the dawn survey between 03:40 h and 04:18 h, with probable return to roost events by means of barn door and gap in gable end. Similarly, a singular brown long-eared bat was identified returning to roost at 03:53 h, through the barn door of B4. In addition, a singular common pipistrelle was identified entering via a gap under the lead capping, on the gable end of B4 at 04:21 h.
- 4.2.30 A brown long eared bat was seen to enter building 1 via the upper right-hand window during the dawn return survey but was observed existing the building some minutes later and is not considered to have gone to roost within the building.

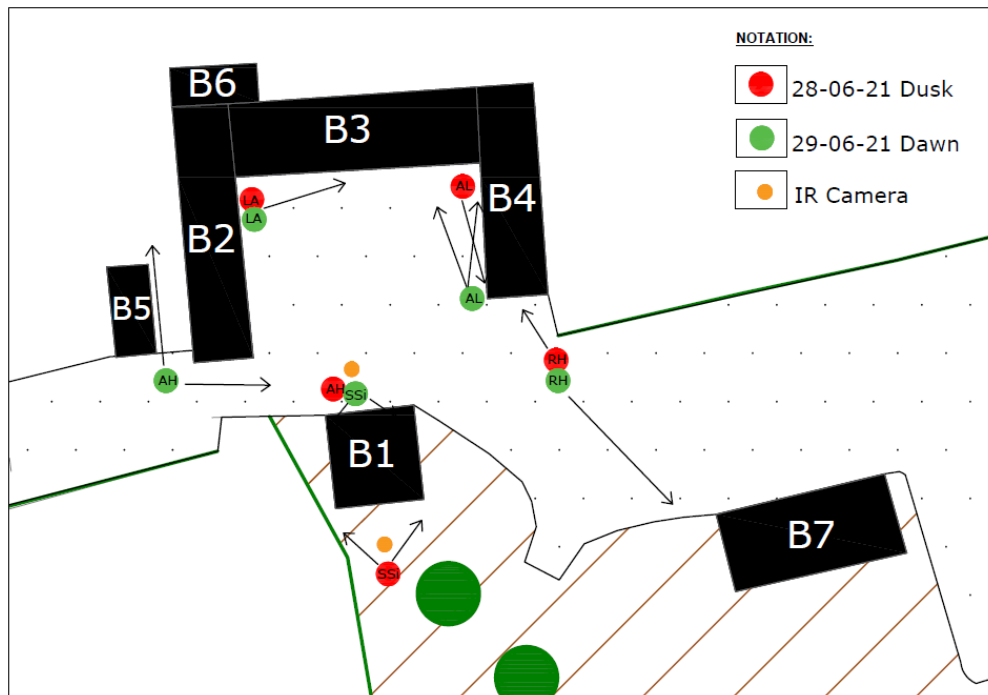


Figure 8: Survey locations - Visit 1

Bat emergence and re-entry survey 19th and 20th July 2021

- 4.2.31 The second suite of dusk emergence and dawn re-entry surveys captured frequent commuting activity over the site and foraging activity around the buildings. Most frequent species recorded were common pipistrelle bats, noctule and brown long-eared bat as seen in the previous survey. Surveyor locations can be seen in Figure 9.
- 4.2.32 A single common pipistrelle bat was seen emerging from the barn door of B3 at 21:58 h and continued to forage within the courtyard. In addition, a single brown long-eared bat emerged from B4 at 22:45 h. During the dawn re-entry survey, two common pipistrelle bats were seen re-entering B3 at 04:33 h and 04:37 h, via a gap in the brickwork on the top right area of the barn door. Furthermore, four brown long-eared bats were seen entering B3 and flying around inside, with only one thought to have exited the building. It is considered that the remaining three bats could be roosting within B3, although the exact roost location could not be determined.

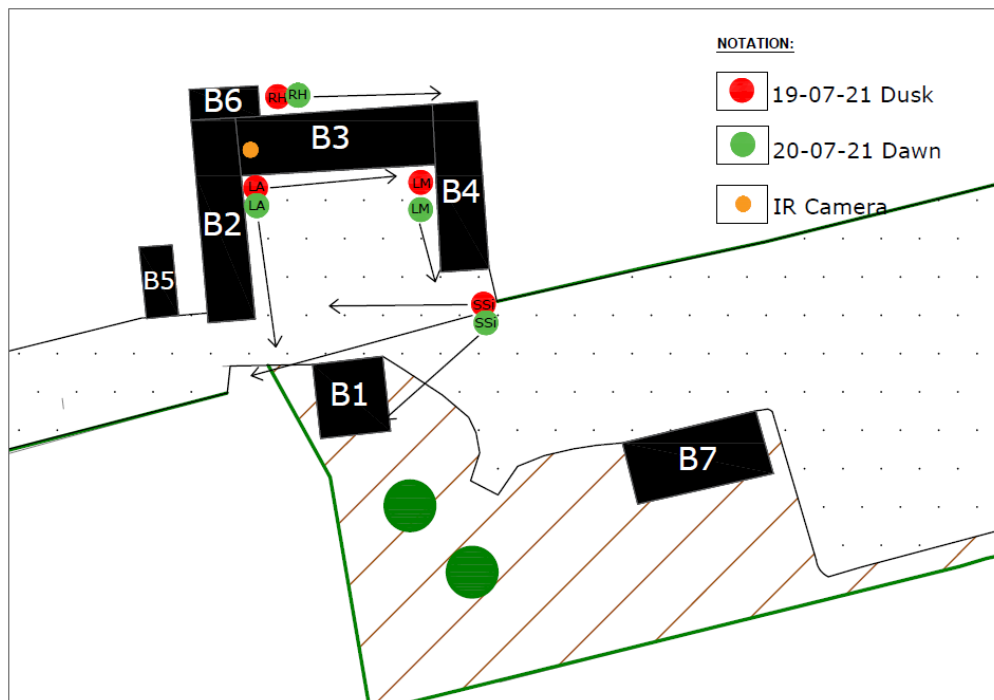


Figure 9: Survey locations - Visit 2

Bat emergence and re-entry survey 2nd and 3rd August 2021

4.2.33 Surveyor locations can be seen in Figure 10. As with the previous survey visits, the dusk emergence and dawn re-entry surveys captured frequent commuting activity over the site and foraging activity around the buildings, with common pipistrelle and noctule being recorded most frequently. *Myotis* sp., and soprano pipistrelle bats were recorded rarely. A singular common pipistrelle was recorded emerging via the barn door of B3 at 21:13 h. In addition, a single common pipistrelle was recorded returning via the barn door the following morning at 04:48 h.

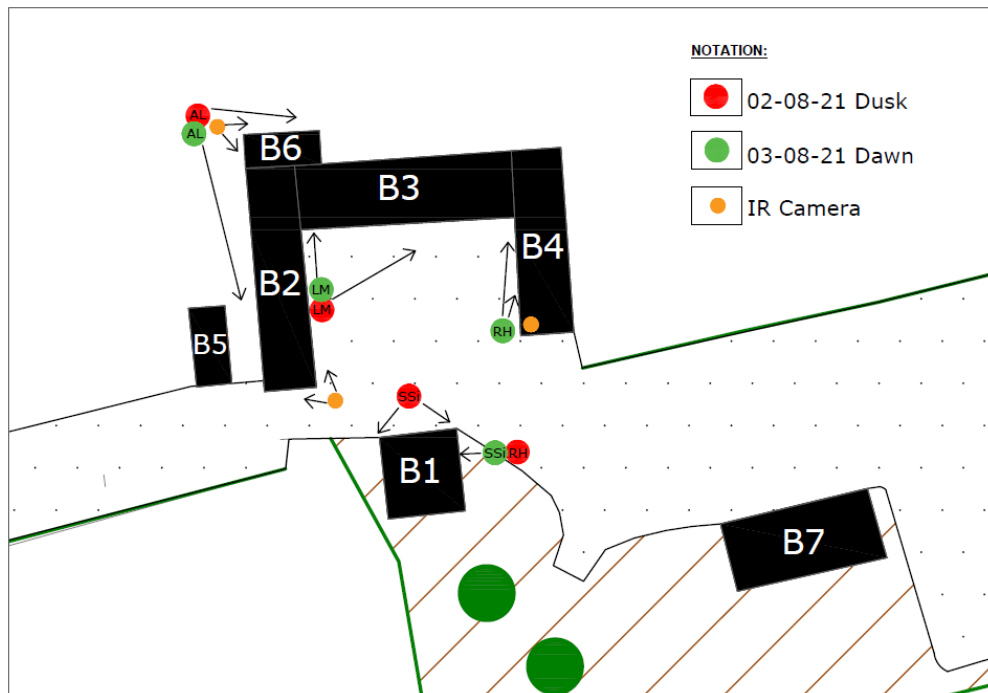


Figure 10: Survey locations - Visit 3

Summary

4.2.34 The surveys undertaken in 2021 confirm that B3 and B4 provide occasional day roosts for a low number of brown long-eared bat and common pipistrelle. Brown long-eared bats were also observed entering Building 1 on a number of occasions and whilst roosting was not confirmed, it is suspected that the building could be used by this species for roosting. Survey of the building was difficult due to the lack of opportunity to inspect the building internally due to health and safety reasons and viewing of the building during nocturnal surveys was compromised by tall and dense vegetation growing around the building. Demolition of these buildings will impact roosting bats without the appropriate mitigation below in Section 5.4. Therefore, roosting bats are considered to be a receptor in respect of the proposed development.

Hibernation

4.2.35 The main barns around the courtyard (B2, B3 and B4) and the farmhouse (B1) were considered to have some suitability to support roosting bats, mostly associated with cracks and gaps within brickwork both internally and externally.

4.2.36 The open nature of the buildings which contain open doorways and windows mean the buildings are bright inside which limits their suitability for hibernating

bats and as the corrugated roofs present on B2, B3 and B4 mean the temperature within the buildings is likely to fluctuate and these buildings are unlikely to provide the stable and consistent temperatures favoured by hibernating bats.

4.2.37 The lean-to shelters and smaller ancillary buildings located around the main barns (B5 & B6) and the open barn B7 were considered to be of negligible interest to hibernating bats being open to the elements and containing limited features to sheltering bats.

4.2.38 Hibernation surveys undertaken in January and February 2022 consisted of a visual inspection of the house (external only) and barn buildings (where accessible) for hibernating bats. The inspections were completed using high powered torches, a telescopic ladder and endoscope to provide a comprehensive search. B1 was not structurally sound and was, therefore, not subject to internal inspection during the survey visits on health and safety grounds. The remaining six buildings were checked, and all accessible features were fully inspected with torch and endoscope and no bats were found. Therefore, hibernating bats are not currently considered to be a receptor in respect of the Proposed Development.

Badger

4.2.39 Information relating to badgers is provided in a separate confidential appendix which accompanies the planning application¹⁹.

Invasive species

4.2.40 No species listed on Schedule 9 of the Wildlife and Countryside Act (1981), as amended, were recorded on site at the time of survey.

Other notable species

4.2.41 Hedgehogs have been recorded within 2 km of the site by NERC and TVERC. The habitats on site are suitable for supporting this species and hedgehogs could be a receptor with respect to Proposed Development of the site.

¹⁹ HLPC (2022). 07-03-22 Land at Banbury – Confidential Badger Addendum

- 4.2.42 A single little owl *Athene noctua* was identified during the nocturnal bat surveys. It is thought to be nesting within B3 and was seen entering and exiting via a hole in the eastern gable end on multiple occasions.
- 4.2.43 The Site habitats are dominated by heavily grazed field with modified grassland, species-poor hedgerows and ponds which are adversely affected by eutrophication and as such largely are considered to provide low value for a range of important terrestrial and aquatic invertebrate species. The greatest likely value identified was associated with the areas of gorse scrub, and mature trees. Based on this assessment the Site is considered to be of Site to Local importance to a range of invertebrate species.

5.0 ASSESSMENT OF EFFECTS AND MITIGATION MEASURES

5.1 The proposed development

5.1.1 The Applicant is submitting an Outline planning application for the construction of up To 140,000 sqm of Employment floorspace (use class B8 with ancillary offices and facilities) and servicing and infrastructure including new site accesses, internal roads and footpaths, landscaping including earthworks to create development platforms and bunds, drainage features and other associated works including demolition of the existing farmhouse. All matters of detail reserved.

5.1.2 The following assessment is based on the illustrative layout of the proposed development produced by MHP Chartered Landscape Architects (drawing Figure 1 Illustrative Landscape Concept Plan 213040.101).

5.2 Statutory and non-statutory designated sites for nature conservation

5.2.1 No internationally designated sites and nationally designated sites were identified within 10km and 2km of the site, respectively.

5.2.2 There are two non - statutory designated sites and a number of pLWS' within 2km of the Site which are assumed to be accessible to the public.

5.2.3 The Proposed Development is for commercial use and the Proposed Development has been designed to include areas for recreational use. Given the distance of these sites from the Proposed Development, and the provision of local recreational facilities within the scheme, it is considered that any additional recreational pressures arising from the Proposed Development would be infrequent and at a Site level. It is recommended that a Construction and Environmental Management Plan (CEMP) includes industry standard pollution prevention measures and is secured via planning condition.

5.3 Habitats

Potential impacts

5.3.1 The Proposed Development will require land take of grassland, a section of scrub, hedgerows, scattered trees, and Ponds 3, 4 and 7. The woodlands, and most areas of scrub habitat are anticipated to be fully retained. The Proposed Development also leaves a number of fields within the Applicant's control, which are proposed to be enhanced with appropriate planting and

management to deliver Biodiversity Net Gain. A number of new wildlife ponds are to be installed, to compensate for the loss of standing waterbodies. Many of the hedgerows will be retained with new replacement species rich hedgerows proposed to mitigate the loss and support habitat connectivity. Areas of grassland will be enhanced with new native woodland, attenuation features, wildlife ponds and an orchard proposed. The existing hedgerows are also planned for enhancement through a management regime and additional species planting and there will be inclusion of a large number of native trees throughout.

5.3.2 These interventions provide habitat biodiversity net gain at a rate of 20.64%. For hedgerows an increase of 32.91% is predicted. The DEFRA biodiversity metric which accompanies the Application should be referred to for further details.

5.3.3 The measurements are based on data supplied and assumptions based on the illustrative landscape masterplan at an outline stage which include the following assumptions:

- Native hedgerows outside the business park area will have up to 7 native species and native trees.
- Native hedgerows inside the business park area will have up to 5 species.
- The area of grassland to be retained will be enhanced to a lowland meadow through appropriate species mixes and / green hay lay and an appropriate management regime.
- Habitats will be able to attain the specified condition via management as set out within a LEMP secured at the reserved matters stage.
- New tree planting will be predominately native species.
- The proposed orchard will use native species/cultivars.
- The proposed woodland will include native tree species.
- At least two separate wildlife ponds will be created for the purpose of providing good quality pond habitat and separate to attenuation functions.

Mitigation measures

- 5.3.4 Retained trees and hedgerow should be protected through the construction phase following advice set out within the British Standard Tree Survey.
- 5.3.5 At the reserved matters stage the phase of development should include a Landscape and Ecological Management Plan (LEMP) setting out how it contributes to delivering BNG and secured via planning condition.
- 5.3.6 Final created habitats should be agreed with the LPA and management secured via a LEMP at the reserved matters stage.

Enhancement

- 5.3.7 No further enhancement measures are considered to be required at this stage.

Significance

- 5.3.8 It is anticipated that the Proposed Development would currently deliver habitat biodiversity net gain beyond 10% biodiversity net gain and be of value to biodiversity at up to a Local level.

Monitoring

- 5.3.9 The success of the landscape scheme could be monitored through standard landscape management practices attached to reserved matters consent.

5.4 Species

Amphibians and Reptiles

- 5.4.1 The Great Crested Newt is a European protected species and is afforded full protection under the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017. (as amended). Common amphibians are afforded protection the Wildlife and Countryside Act in relation to sale and trade. All species are UK Biodiversity Action Plan priority species²⁰.
- 5.4.2 Whilst reptiles were not recorded during survey, the survey area was limited by the presence of cattle. A precautionary approach has therefore been taken.

²⁰ This is not the full legal wording and is intended as a summary only. Full details can be found at www.legislation.gov.uk

- 5.4.3 Without additional mitigation the temporary loss of common amphibian breeding habitat and permanent loss of terrestrial habitat during the construction phase could be of significance to populations of common amphibians at a Site level. There is a low risk of common reptiles being present at the time of survey.
- 5.4.4 Following completion and establishment of proposed ponds and areas of enhanced grassland diversity would be positive for local common amphibians and reptiles and significant at a Site to Local level.
- 5.4.5 Prior to any works affecting ponds and terrestrial habitat commencing, an Amphibian and Reptile Reasonable Avoidance Method Statement should be agreed with the LPA and secured via planning condition to minimise impacts to amphibians and reptiles during the construction phase and should as a minimum include the following:
- A Tool-box talk to all relevant contractors by an appointed Ecological Clerk of Works including how to identify common amphibians, common reptiles and great crested newts and what to do in the event of any of these species being found.
 - A method statement and timings for draw down of ponds to minimise impacts to common amphibians.
- 5.4.6 This information should be included within the CEMP.
- 5.4.7 The reserve matter application(s) landscaping scheme should identify in detail the number, profile and planting specification of all ponds to demonstrate a benefit for amphibian species.
- 5.4.8 Should more than two years have passed since the assessment of ponds within 250 m of the Site for great-crested newts then an update assessment should be undertaken by a suitability experienced ecologist and if necessary, surveys undertaken to confirm the current status of the Site with regard to great-crested newts.
- 5.4.9 Reptiles are highly mobile and whilst no reptiles were recorded during the survey, should more than two years have lapsed since the date of the survey a re-assessment should be undertaken by an experienced ecologist.

Birds

- 5.4.10 All species of native British birds are protected only the Wildlife and Countryside Act 1981 (as amended) making it an offence to intentionally kill, injure or take any species of wild bird, and to take, damage or destroy their nests or eggs. Several species receive higher levels of protection from disturbance under the Schedule 1 of the Act. Several declining bird species are also Priority Species under the NERC Act 2006.

Potential impacts

- 5.4.11 The proposed construction of commercial units will permanently remove suitable breeding habitats for a variety of species of conservation concern. Many species sightings fall within the realm of anticipated habitat loss (See figures within Appendix 4). The loss of grassland and sections of hedgerows is likely to have a negligible impact on breeding birds and the habitats with the most value are anticipated to be retained. Enhancement of existing grassland, installation of woodland, installation of SuDS and wildlife ponds and enhancement of hedgerow post-development will provide suitable habitat enhancement for a variety of bird species. Retained grassland areas within the eastern proportion of site will provide suitable ground-nesting habitat to skylark that were recorded breeding at the time of survey.

Mitigation measures

- 5.4.12 Skylark was the only ground-nesting birds found breeding in the site; however, a range of open nesting birds (birds that nest within hedgerows) were present within the site. As a precautionary approach any vegetation should be removed outside the nesting bird season (nesting season runs March-August, inclusive) where practicable. Should these works be scheduled during the nesting bird season then the vegetation to be cleared should be checked by a suitably experienced ecologist immediately beforehand. In order to prevent disturbance or harm to individuals, work should not be carried out within a minimum of 5m of any in-use nest, although this distance could be more depending on the sensitivity of the species.
- 5.4.13 Three Schedule 1 species and suitable breeding habitat for these species were present within and in the vicinity of the site. Prior to start of any construction works within the site, species specific surveys should be undertaken to identify if breeding Schedule 1 species or their dependent

young are present within the site or within an impact zone and appropriate mitigation put in place.

Enhancement

- 5.4.14 The LEMP at the reserved matters stage should include details on installation of 30 no. bird nest boxes (Schwegler 1B bird nest box or similar) and 10 no. Vivara Pro Barcelona WoodStone Open Nest Box for a variety of bird species upon retained trees or new buildings that would be of benefit to the local bird populations. The LEMP should detail species mixes for the benefit on the local bird assemblages.

Significance

- 5.4.15 Assuming the above measures are secured through a planning condition it is anticipated that the Proposed Development would not result in an adverse impact to breeding birds and would enhance site habitats at Site level.

Monitoring

- 5.4.16 No additional monitoring is considered to be required outside the standard landscape planting maintenance requirements.

Bats

- 5.4.17 In Britain all bat species and their roosts are legally protected, by both the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017 (as amended). Several species are also Priority Species under the NERC Act 2006.

Potential impacts

- 5.4.18 The surveys undertaken in 2021 confirm that B3 supports brown long-eared bat and common pipistrelle bat day roosts with small numbers of bats seen to emerge from this building. A further brown long-eared bat roost was recorded from B4 with a single bat seen to emerge and then return to this building. Brown long-eared bats were seen foraging within B1 on a number of survey visits but it wasn't clear if the building was being used for roosting.
- 5.4.19 Brown long-eared bat were identified infrequently or rarely during transect and static detector surveys, although this could be due to the difficulties in detecting this species due to their short-range calls and does not provide an accurate occurrence of this species. At this stage B3 and B4 will be retained

but likely affected by new buildings and lighting and as a precaution assumes the roosts cannot be retained in-situ.

- 5.4.20 Any introduced artificial lighting could disrupt potential commuting and foraging activities associated with site habitats and boundary hedgerows.

Mitigation measures

- 5.4.21 Whilst building 3 and building 4 will be retained under the current proposals, the roosts could be affected by the adjacent development and or through renovation works to these buildings. Given the low conservation status of the roosts, works are currently considered eligible under a Bat Mitigation Class Licence (BMCL). Prior to any works adjacent to the building, demolition or renovation works with confirmed bat roosts it will be necessary to register the site with Natural England using a BMCL. If further surveys record a higher conservation status roost, or the number of roosts exceeds the accepted limit for the BMCL, then a European Protected Species Licence (EPSL) will be required.

- 5.4.22 It is advised that the works are planned to commence at a suitable time for undertaking mitigation works, i.e., avoiding maternity and hibernation seasons. Some liaisons with the scheme designers may be required to discuss the mitigation measures and the works requirements.

- 5.4.23 If the buildings are to be demolished or renovated (including roofing works), the following should be adopted.

- 5.4.24 Once registering the site with Natural England, delivery of the bat licence will entail strict mitigation activities. On the morning the supervised strip works are to commence, it is likely that a licensed bat ecologist will undertake a pre-start dawn survey and deliver a Toolbox Talk to roofing staff. The supervised strip will be overseen by the Registered Consultant/Named Ecologist and undertaken by a roofing team. A search for bats will be undertaken at all potential roosting features, including the roof tiles, and temporary excluders will be used where considered appropriate. Any rescued bats found will be carefully moved by hand to the pre-installed bat boxes.

- 5.4.25 To minimise impacts to foraging bats, artificial lighting introduced during the construction works should be fitted with a directional cowl. Lighting should then be positioned in such a way that avoids light spill over hedgerow habitats

along the site boundaries to allow in the final design bats to continue to access the landscape.

- 5.4.26 The final lighting scheme at the reserved matters stage should be sensitive to local bat foraging and commuting activity and avoid light spill over hedgerow habitats along the site boundaries to ensure continued foraging and commuting opportunities for bats.
- 5.4.27 To minimise disturbances to bats key foraging areas have been retained and incorporated into the layout. Should landscape proposals change and felling of any trees be required, a suitably qualified ecologist must be consulted, and further surveys undertaken if required.
- 5.4.28 At the reserved matters stage, when trees to be removed have been confirmed, a Bat Roost Potential survey should be undertaken by an experienced ecologist and any necessary surveys undertaken to determine bat presence/absence undertaken. Should roosting bats be present no works to trees or associated hedgerows should be undertaken until appropriate mitigation is in place including obtaining any necessary Natural England licences. This should be secured via planning condition.

Enhancement

- 5.4.29 At the reserved matters stage the LEMP should detail the installation of 10 no. bat roost boxes (Schwegler 2F bat boxes or similar) for a variety of bat species upon retained trees or new buildings for the benefit to the local bat populations.

Significance

- 5.4.30 Assuming the above measures are secured through a planning condition it is anticipated that the proposed development would not result in a significant adverse impact to foraging, commuting, and roosting bats.

Monitoring

- 5.4.31 No monitoring is considered to be required at this stage outside of that required by any necessary Natural England licencing.

Other notable species – hedgehog & little owl

Potential impacts

5.4.32 The habitats on site could be used by hedgehogs. Hedgehogs are listed as a Priority Species under the NERC Act 2006.

5.4.33 A single little owl *Athene noctua* was identified nesting in B3 on site. Although an introduced species, all wild birds are protected under The Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built.

Mitigation measures

5.4.34 Should a hedgehog be found, it should be moved using a gloved hand to a place of safety and shelter. A suitable gap (13 cm x 13 cm) should be included in new boundary treatments to allow passage of hedgehogs. These can be marked with signs so that they are not blocked off in the future (<https://www.hedgehogstreet.org/help-hedgehogs/link-your-garden/>).

5.4.35 As a precautionary approach any vegetation should be removed outside the nesting bird season (nesting season runs March-August, inclusive) where practicable. In order to prevent disturbance or harm to individuals, work should not be carried out within a minimum of 5m of any in-use nest, although this distance could be more depending on the sensitivity of the species.

Enhancement

5.4.36 Installation of 10no. HH7 Hogilo hedgehog houses would be of benefit to local hedgehog populations.

5.4.37 Erection of an owl or kestrel bird box would be of benefit to nesting little owl. 4 no. Schwegler No5 owl box are proposed as part of the Biodiversity Impact Assessment.,

5.4.38 The Proposed Development includes areas of enhanced grassland with windflowers which would benefit a range of terrestrial invertebrate species. New wildlife ponds should also benefit a range of aquatic invertebrate species.

5.4.39 At the reserved matters stage the landscape design should include appropriate native species mixes and insect boxes to benefit the local invertebrate populations and secured via a suitable planning condition.

Monitoring

5.4.40 No monitoring is considered to be required.

Significance

- 5.4.41 Assuming the above measures are implemented it is anticipated that the Proposed Development would provide an enhancement to hedgehogs or little owl and terrestrial/aquatic invertebrates.

7.0 APPENDICES

Appendix 1: Site Images



Plate 1	Outbuildings complex B2-6	
Plate 2	B1	




Plate 3	B7 and example farmyard	
Plate 4	Example improved pasture of	
Plate 5	Example cattle grazing and hedgerow network	




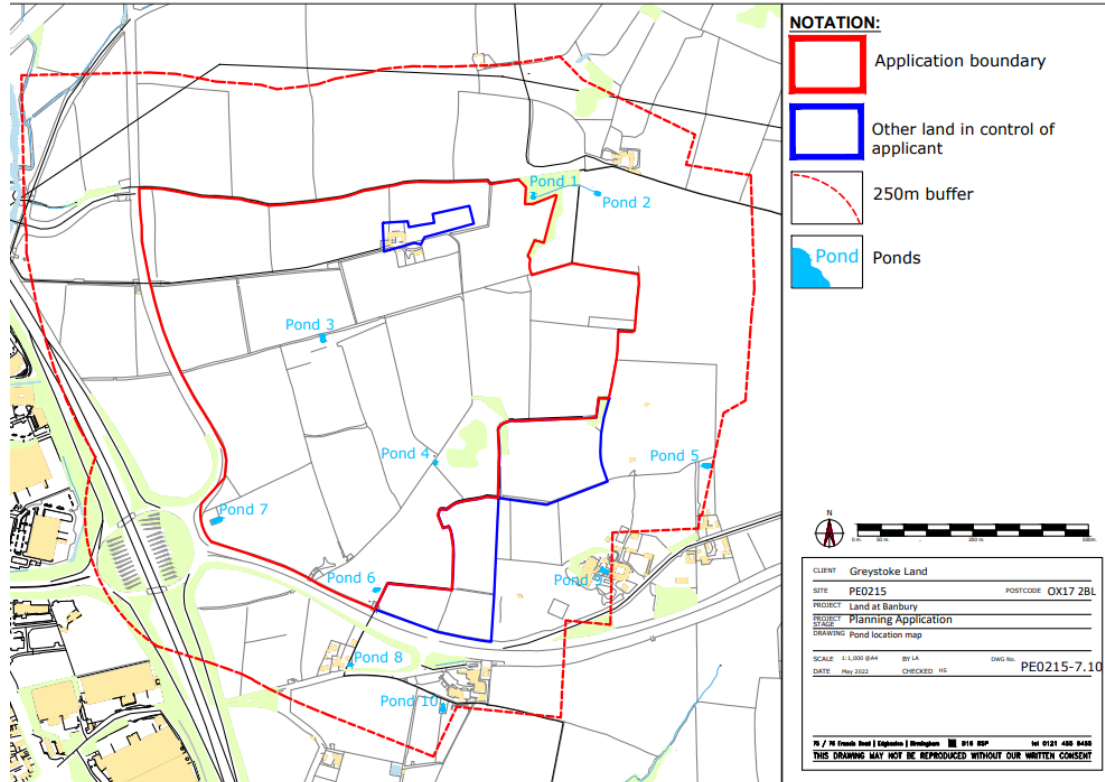
Plate 6	Example pond habitat onsite (P6)	
Plate 7	Example scrub habitat	
Plate 8	Example of modified grassland and boundary mature trees	

Plate 9	Pond 1	 <p>Pond 1</p>
---------	--------	--

Appendix 2: Amphibian Survey Results





Folio No: E10414
 Report No: 1
 Purchase Order: EN0071
 Client: HARRIS LAMB
 Contact: Holly Smith

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: 18/05/2021
Date Reported: 20/05/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
5035	Land of Banbury, Pond 1	SP48014259	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth

Approved by: Chris Troth



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
 UK Tel: +44 (0)1332 292003 Email: scientific@surescreen.com
 Company Registration No. 08950940

Page 1 of 2



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.



Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, West Yorkshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientific@surecreen.com
Company Registration No. 08950940

Page 2 of 2



Folio No: E11459
 Report No: 1
 Purchase Order: EN0118
 Client: HARRIS LAMB
 Contact: Rob Harrison

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: 02/07/2021
Date Reported: 13/07/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
7141	BANBURY P7	SP 47323 41885	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth

Approved by: Chris Troth



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
 UK Tel: +44 (0)1332 292003 Email: scientific@surescreen.com
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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

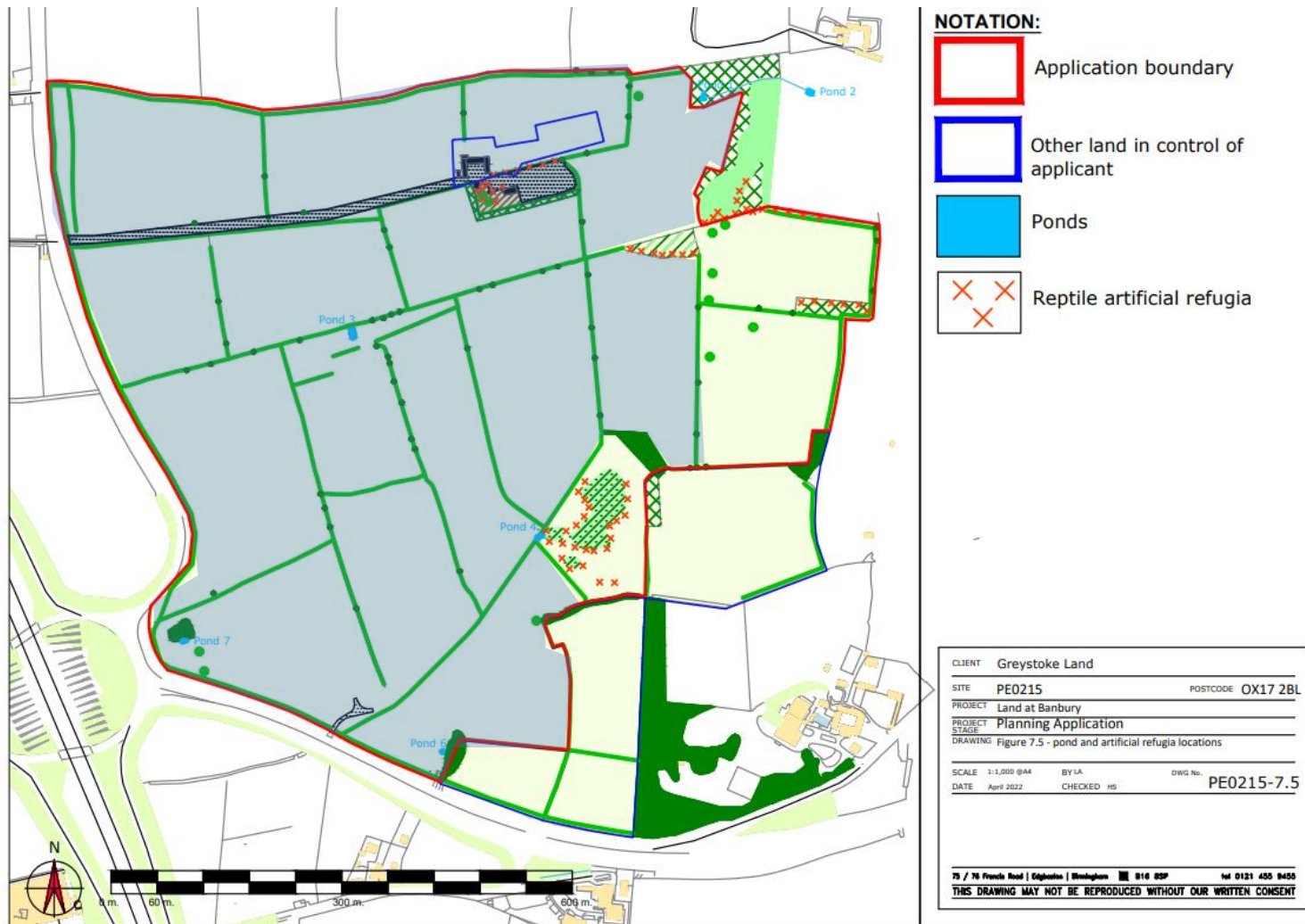
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When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.
- DC: Degradation Check [Pass/Fail]**
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.
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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.



Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

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Appendix 3: Reptile Survey Data



Note shaded area had repeatedly high cattle presence making artificial refugia at risk from trampling

Reptile Survey - PE0215 - Banbury							
Survey Number	1	2	3	4	5	6	7
Date	06/09/2021	09/09/2021	15/09/2021	21/09/2021	24/09/2021	28/09/2021	07/10/2021
Temperature (°C)	16°C	16°C	18°C	12°C	12°C	12°C	14°C
Weather conditions	Dry, clear	Dry, 70% cloud	Dry, 5% cloud	Dry, 50% cloud	Dry, clear	Dry, 10% cloud	Dry, 20% cloud
Time start	08:26	08:14	16:09	08:28	08:35	08:41	08:42
Time end	10:09	10:15	17:43	10:11	10:13	10:15	11:12
Surveyor initials	LA	LA	LA	LA	LA	LA	LA
Total no. reptiles recorded	0	0	0	0	0	0	0
Grass Snake	0	0	0	0	0	0	0
Common Lizard	0	0	0	0	0	0	0
Adder	0	0	0	0	0	0	0
Slow Worm	0	0	0	0	0	0	0
Smooth Snake	0	0	0	0	0	0	0
Sand Lizard	0	0	0	0	0	0	0
Amphibians/ Other	0	0	0	0	0	0	0

Appendix 4: Breeding Bird Survey Report



Breeding Bird Survey Report

Land north of A422

Banbury

Harris Lamb Property Consultants Ltd.

FE-019-200-023-400-R-01-V1

October 2021



FALCO Ecology

**FALCO Ecology Ltd is a registered company (England & Wales): 10885438
VAT reg. no: 364 7407 81 M: 07928040460 E: adrian@falcoecology.co.uk
18 Moorside, Great Lime Road, West Moor, Newcastle upon Tyne, NE12 7NL**



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DOCUMENT CONTROL

Confidentiality: **Not Confidential**

Site Name	Land north of A422
Report Name:	Breeding Bird Survey Report
Client:	Harris Lamb Property Consultants Ltd
Reference No:	FE-019-200-023-400-R-01-V1

Document Checking

Written by: Andrew Walker	Date: 13/10/2021
Checked by: Adrian George	Date: 14/10/2021

Issue	Date	Status	Comments
V1	14/10/2021	Final	

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1 Executive Summary

Introduction

FALCO Ecology Ltd. was commissioned by Harris Lamb Property Consultant (HLPC) to undertake a suite of breeding bird surveys on the land north of A422, Banbury (hereon referred to as the "Site").

The purpose of the surveys was to determine the number of bird territories within the Site and how birds use the Site. Details of the breeding bird survey (BBS) and subsequent assessment are included within this report.

The address of the Site was north of A422 and east of the A361 on the east side of Banbury. The central Ordnance Survey grid reference for the Site was SP 47630 42195 and the Site was ~125m rising to ~150m above sea level.

The surrounding area of the Site was mixed farmland to the north, east and south and the market town of Banbury to the west.

Methodology

A desktop study included a data search from web recourses which included the Government's Multi-Agency Geographic Information for the Countryside or 'MAGIC' website and Google Earth Pro.

A three-visit breeding bird survey was undertaken within the indicative site boundary. The territory mapping methodology was based on a reduced survey effort of the Common Bird Census. The surveys were carried out during the mid-June to early-July 2021 period, which was within the core breeding bird season of April to July, inclusive. Birds heard and seen outside the survey area were recorded to an approximate distance of 100m; therefore, accurate territory counts outside the Site were not obtained.

The direction of travel of the BBS route was reversed on each visit to prevent temporal bias. The survey route followed the site boundary and along hedgerows within the Site.

All survey visits were undertaken by a suitably experienced ornithological surveyor.

The survey started in mid-June and therefore, it is plausible that early breeding species such as Mistle Thrush may have been under recorded. However, given the arable nature of the Site, it is unlikely that many early breeding species that would be impacted by the proposed development would be present within the survey area.

Results

A total of 43 species were recorded during the 2021 BBS survey. Of these, 17 were species of conservation concern, including ten that showed evidence of breeding or holding territory within the Site, which included Stock Dove (nine pair), Dunnock (twelve pairs), Song Thrush (five pair), Linnet (one pair) and Kestrel (one pair). Cuckoo (one male) was holding territory within the wider survey area.

A further 26 bird species (not of conservation concern) were recorded, many of which were considered likely to be breeding or holding territory within Site and/or surrounds but none were recorded in particularly notable numbers or densities

Evaluation

Assessment

The pasture fields are considered to be of negligible value to birds of conservation concern. Habitat features such hedgerows and woodland supported most of the breeding birds of conservation concern and therefore have low value. Specific maintenance of specific habitat features (e.g. hedgerows and woodland) throughout the Site may increase their value to birds of conservation concern.

Overall, the Site is considered to be of **low** value to breeding birds at a local scale.



Impact

The proposed construction of commercial units will permanently remove suitable breeding habitats for a variety of species of conservation concern. The loss of pasture farmland and hedgerows is likely to have a negligible impact on breeding birds; however, a full site design would be required to fully assess the impact on breeding birds.

To minimise the impact of the proposed development, the site design should incorporate an element of hedgerows and grassland buffer areas. Furthermore, a habitat management plan should be devised to provide long-term habitat maintenance.

Recommendations

Skylark was the only ground-nesting birds found breeding in the Site; however, a range of open nesting birds (birds that nest within hedgerows) were present within the Site. A precautionary approach is recommended that clearance of ground vegetation and any hedgerow or scrub removal is undertaken outside the breeding season.

Three Schedule 1 species and suitable breeding habitat for these species were present within and in the vicinity of the Site. Prior to start of any construction works within the Site, species specific surveys should be undertaken to identify if breeding Schedule 1 species or their dependent young are present within the Site or within an impact zone.



2 Introduction

2.1 Background

- 2.1.1 FALCO Ecology Ltd. was commissioned by Harris Lamb Property Consultant (HLPC) to undertake a suite of breeding bird surveys on the land north of A422, Banbury (hereon referred to as the "Site").
- 2.1.2 The purpose of the surveys was to determine the number of bird territories within the Site and how birds use the Site. Details of the breeding bird survey (BBS) and subsequent assessment are included within this report.
- 2.1.3 This report was written by Andrew Walker, Associate Principal Ornithologist with FALCO Ecology Ltd and reviewed by Adrian George, Director of FALCO Ecology Ltd. Adrian is a full member of the Chartered Institute of Ecology and Environmental Management and both have over 15 years experience in the ecology sector.
- 2.1.4 All bird species detailed within this report follow the sequence and taxonomy recommended by the British Ornithologists' Union (BOU) (2021). Bird names used differ from those recommended by the BOU in that they follow the British (English) vernacular names in common usage by birders and ornithologists in the UK. These vernacular names are detailed in BOU (2021) and shown in Appendix 2, along with the conservation status of each species in the United Kingdom (UK) context.

2.2 Site Description and Locality

- 2.2.1 The address of the Site was north of A422 and east of the A361 on the east side of Banbury. The central Ordnance Survey grid reference for the Site was SP 47630 42195 and the Site was ~125m rising to ~150m above sea level. The indicative site boundary and habitats within the Site, from 2021, are shown in Figure 1 (page 4).
- 2.2.2 The surrounding area of the Site was mixed farmland to the north, east and south and the market town of Banbury to the west. The wider surrounding area and habitats are shown in Figure 2 (page 4).

2.3 Development Proposals

- 2.3.1 It is proposed to develop the Site into commercial units and therefore the habitats would be permanently lost.
- 2.3.2 The unmitigated proposed development has the potential to destroy active nests and remove breeding and foraging habitat for birds.



Figure 1: Indicative site boundary.

© Google Earth. Imagery Date: 04/04/2021.



Figure 2: Surrounding habitats & approximate 2km buffer.

© Google Earth. Imagery Date: 04/04/2021.



2.4 Survey and Reporting Objectives

2.4.1 A desk study and a series of breeding bird surveys were carried out between June and July 2021 to provide the basis on which to assess the potential for effects to bird species during the construction and operation of the proposed development.

2.5 Legislation

2.5.1 Active bird nests are fully protected from deliberate and reckless destruction under the Wildlife & Countryside Act 1981 (as amended) (WCA). This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the 'Bern Convention' and the Birds Directive are implemented in the UK. Since it was first introduced, the Act has been amended several times. In short, the WCA makes it an offence to:

- Intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- intentionally take or destroy the egg of any wild bird; and
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

2.5.2 If convicted of an offence under the WCA then a penalty maybe imposed with an unlimited fine and/or up to six months imprisonment per offence.

2.5.3 Further legislation related to birds are shown in Appendix 3.



3 Methodology

3.1 Desktop Study

Data Search

3.1.1 A data search from following web recourses was used:

- The Government’s Multi-Agency Geographic Information for the Countryside or ‘MAGIC’ website, which provides details of statutory sites designated for their ecological interest; and
- Google Earth Pro was utilised to assess the habitats surrounding the Site for their suitability to support foraging and nesting birds.

3.2 Field Survey

3.2.1 A three-visit breeding bird survey (hereon referred to as the “survey”) was undertaken within the indicative site boundary and ~100m buffer (hereon referred to as the “survey area”). The territory mapping methodology was based on a reduced survey effort of the Common Bird Census (CBC) as described in both Gilbert *et al.* (1998) and Bibby *et al.* (2000). The surveys were carried out during the mid-June to early July 2021 period, which was within the core breeding bird season of April to July, inclusive. Birds heard and seen outside the Site were recorded to an approximate distance of 100m. Accurate territory counts outside the Site were not obtained; however, the data collected provides an indication of what key species are in the vicinity of the Site.

3.2.2 The direction of travel of the BBS route was reversed on each visit to prevent temporal bias. The survey route followed the site boundary and along hedgerows within the Site.

3.2.3 Equipment used during the surveys included Nikon Monache 7 binoculars.

3.2.4 The dates, survey times, and weather conditions of each survey visit are detailed in Table 1. Wind speed is recorded as per the standard Beaufort Scale and cloud cover in aviation oktas scale. The field surveys were undertaken by Steve Haynes.

Table 1: Breeding bird survey dates, times, weather details.

Visit	Date	Time (hours)	Visibility	Wind direction	Wind speed	Rain	Cloud	Temp.
1	19.6.21	05:35-08:35	Good	SE	1	Slight rain until 07:00	8/8	Not recorded
2	30.6.21	05:15-08:00	Good	NE	0-1	Nil	8/8	13°C > 15°C
3	7.7.21	05:30-08:20	Good	SSW	1-2	Nil	8/8	13°C > 15°C



3.3 Surveyor's Experience

Steve Haynes

3.3.1 Steve is a professional ornithologist undertaking bird surveys for a variety of ecological consultancies and in the past has been the Warwickshire Bird Recorder. He is heavily involved in the monitoring of barn owls within the Midlands.

3.4 Data Analysis

3.4.1 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);
- Annex I-listed species on the Conservation of Habitats and Species (Amendment) (EU exit) Regulations (CSHR)/Birds Directive;
- Species of Principal Importance listed on the Natural Environment and Rural Communities (NERC) Act, 2006; and/or
- Red and Amber listed birds of conservation concern.

3.4.2 To analyse the data, all registrations of these species were transferred from the field maps to produce species specific 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), with an element of professional judgement.

3.4.3 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.

3.5 Limitations

3.5.1 The survey was undertaken from within the Site. Observations of the surrounding area from within the Site provided good coverage within approximately 100m of the Site. Accurate territory counts were not plausible within the surrounding area.

3.5.2 Due to the presence of cows within some of the fields in the Site during the survey period, access to these areas was not possible for health and safety requirements. However, these fields containing cows and the boundary features were scanned for birds where possible from the nearest possible viewpoint.

3.5.3 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 land management, 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, combined with desk-based resources where



appropriate. This precautionary approach to analysis aims to provide the most accurate baseline possible with the data available.

- 3.5.4 Despite the limitations identified, the survey results are considered to be an accurate reflection of the bird use at the Site.
- 3.5.5 The details within this report will remain valid for a period of 12 months. Beyond this period, it is recommended that an updated breeding bird survey is carried out.



4 Results

4.1 Desktop Study

Data Search

Statutory Designated Sites

4.1.1 The Site did not lie within a statutory designated site and there were no statutory designated sites within 2km of the Site.

4.2 Field Survey

4.2.1 A total of 43 species were recorded during the 2021 BBS survey. Of these, 17 were species of conservation concern, including ten that showed evidence of breeding or holding territory within the Site. Territory holding and non-territory holding species of conservation concern are summarised in Table 2 and Table 3 (page 10), respectively.

4.2.2 Figure 3 (Appendix 1) shows the approximate central location of the territories for UK Red List species, whilst Figure 4 (Appendix 1) shows the approximate central location of the territories for UK Amber List species.

Table 2: Species of conservation concern breeding or holding territory within the Site and wider survey area.

Species	Number of territories recorded within Site (number within survey area)	Notes
Cuckoo	0 (1)	One bird present to the east of the Site on Visit 1 of the survey. A probable breeding species given the time of year of the sighting and the presence of suitable host species in the local area.
Stock Dove	9 (10)	Commonly recorded within the Site with nine territories identified. Pairs were utilising natural nest sites (e.g. in trees) and within farm buildings (e.g. Huscote Farm).
Kestrel	1 (1)	An active nest was present within the Site. Breeding was confirmed with chicks in the nest.
Skylark	1 (1)	One territory in grassland in the west of the Site.
Song Thrush	5 (5)	Five territories identified from suitable areas (woodland and hedgerow with scattered trees) within the Site.
Mistle Thrush	1 (1)	One territory within woodland in the south of the Site was the only one identified during the survey.
Dunnock	12 (16)	Common within the Site with 12 pairs considered to be holding territory in areas of scrub, woodland, and hedgerows. Four pairs in the southeast of the survey area outside the Site.
Bullfinch	1 (1)	One territory in a hedgerow in the centre of the Site.



Species	Number of territories recorded within Site (number within survey area)	Notes
Linnet	3 (3)	Three pairs considered to be holding territory in scrub and hedgerow areas within the Site.
Yellowhammer	3 (3)	Three pairs considered to be holding territory in scrub and hedgerow areas within the south of the Site.

Table 3: Species of conservation concern not considered to be holding territory

Species	Notes
Swift	No Swift territories were located within the Site or the survey area during the surveys. Small foraging flocks were observed over the Site on visits 2 and 3. Likely to be breeding in period properties beyond the survey area.
Little Ringed Plover	No observations of Little Ringed Plover were recorded within the Site during the survey. An observation of a single individual was recorded within the adjacent western field, which appeared to have a sustainable urban drainage systems (SuDS) pond created within it. The bird was present in suitable breeding habitat.
Black-headed Gull	Steady streams of birds recorded in flight over the Site. Not observed foraging within the Site during the surveys. No breeding habitat was present within the Site or survey area.
Lesser Black-backed Gull	No territories were located within the Site during the survey period. Birds were recorded foraging within the Site during the survey period. A peak flock count of 60 birds was recorded on Visit 2, although it was considered that there ~150 individuals within the Site on Visit 2.
Red Kite	Two records during the survey period. A bird flew west over the Site on Visit 2. One flew over the northern survey area on Visit 3. No breeding behaviour was observed during the surveys and limited suitable nesting habitat exists.
Peregrine	One flew south over the Site on Visit 1. No breeding habitat was present within the Site; however, pylons were present within the northern survey area.
Starling	Starlings were not recorded breeding within the Site. Suitable nesting habitat was present at Huscote Farm. Post breeding foraging flocks were recorded within the Site with a peak count of 35 birds on Visit 3.

4.2.3 A further 26 bird species (not of conservation concern) were recorded, many of which were considered likely to be breeding or holding territory within Site and/or surrounds but none were recorded in particularly notable numbers or densities: Pheasant, Woodpigeon, Buzzard, Little Owl, Great Spotted Woodpecker, Green Woodpecker, Jay, Magpie, Jackdaw, Carrion Crow, Raven, Coal Tit, Blue Tit, Great Tit, Long-tailed Tit, Chiffchaff, Blackcap, Whitethroat, Wren, Treecreeper, Blackbird, Robin, Pied Wagtail, Chaffinch, Greenfinch and Goldfinch.



5 Assessment

5.1 Evaluation

- 5.1.1 A small number of species of conservation concern were found holding territory within the Site, those that were holding territory, were found in boundary features such as hedgerows and surrounding woodlands, which included Stock Dove (nine pair), Dunnock (twelve pairs), Song Thrush (five pair), Linnet (one pair) and Kestrel (one pair). Cuckoo (one male) was holding territory within the wider survey area.
- 5.1.2 The pasture fields are considered to be of negligible value to birds of conservation concern. Habitat features such as hedgerows and woodland supported most of the breeding birds of conservation concern and therefore have low value. Specific maintenance of specific habitat features (e.g. hedgerows and woodland) throughout the Site may increase their value to birds of conservation concern.
- 5.1.3 Overall, the Site is considered to be of **low** value to breeding birds at a local scale.

5.2 Impact

- 5.2.1 The proposed construction of commercial units will permanently remove suitable breeding habitats for a variety of species of conservation concern. The loss of pasture farmland and hedgerows is likely to have a negligible impact on breeding birds; however, a full site design would be required to fully assess the impact on breeding birds.
- 5.2.2 To minimise the impact of the proposed development, the site design should incorporate an element of hedgerows and grassland buffer areas. Furthermore, a habitat management plan should be devised to provide long-term habitat maintenance.
- 5.2.3 There is the potential for disturbance to nesting birds during the construction phase. Given the scale of the development, it is likely that some construction works will occur within the breeding season (approximately March to August inclusive) and may cause a temporary disturbance to nesting birds, this will be **negligible** and not significant. However, the destruction of active nests is an offence under the WCA.



6 Recommendations

- 6.1.1 Skylark was the only ground-nesting birds found breeding in the Site; however, a range of open nesting birds (birds that nest within hedgerows) were present within the Site. A precautionary approach is recommended that clearance of ground vegetation and any hedgerow or scrub removal is undertaken outside the breeding season.
- 6.1.2 Three Schedule 1 species and suitable breeding habitat for these species were present within and in the vicinity of the Site. Prior to start of any construction works within the Site, species specific surveys should be undertaken to identify if breeding Schedule 1 species or their dependent young are present within the Site or within an impact zone.



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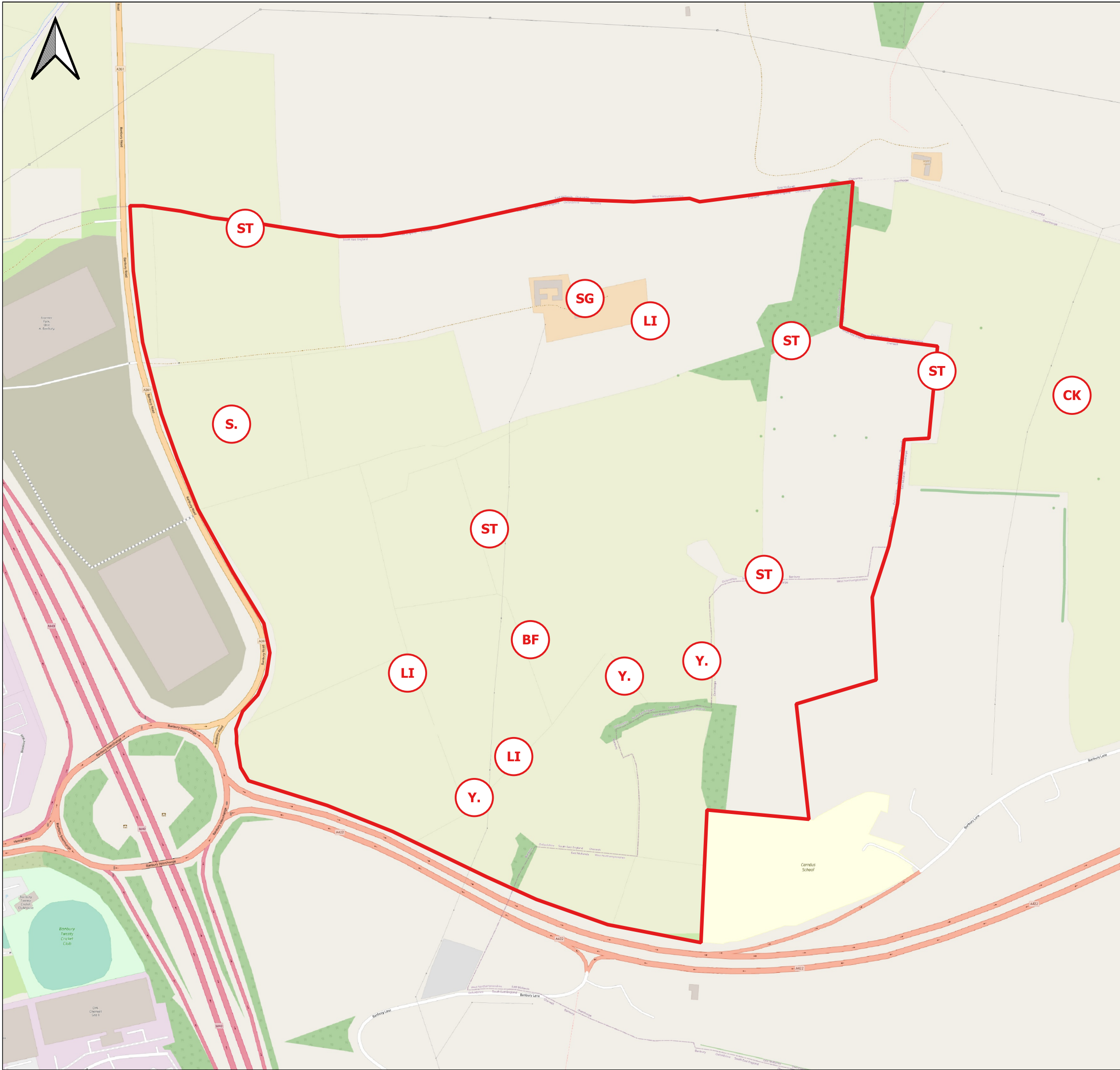
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Appendix 1 – Figures

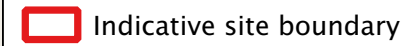


LEGEND

UK Red List Species

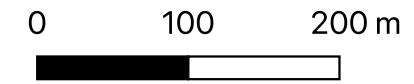


Singing



Indicative site boundary

OpenStreetMap



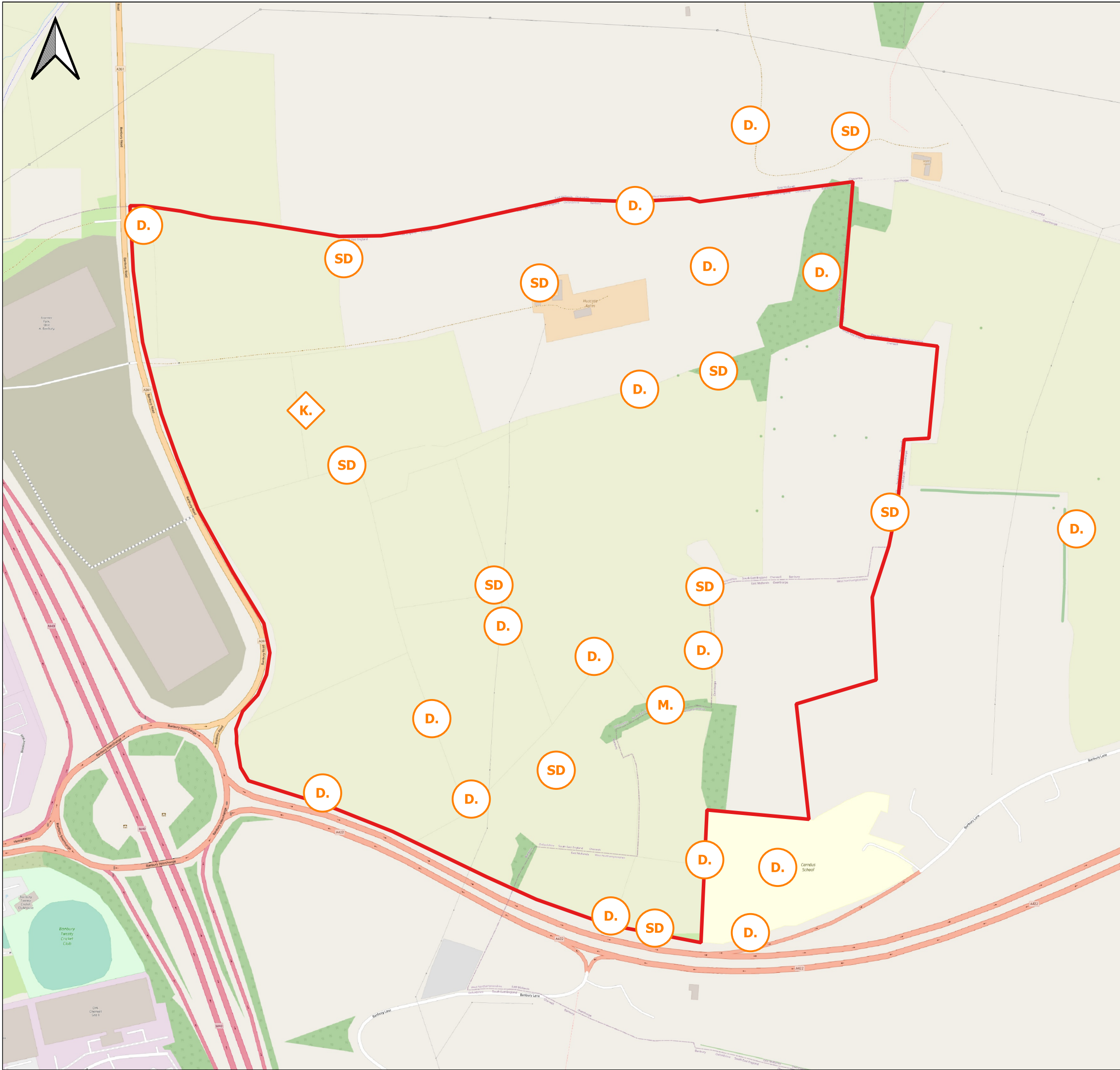
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RO	Final	AJG	AJG	AJG	13.10.21
R1					

Client	Harris Lamb Property Consultants Ltd.
Project	Land north of A422
Title	Approximate Central Location of Territories for Red List Species
Figure Number	3
Scale	1:5,000 @A3
Document Reference	FE-019-200-023-500-D-01



18 Moorside, Great Lime Road, West Moor, Newcastle upon Tyne, NE12 7NL
 Tel: 07928040460
 Email: adrian@falcoecology.co.uk
 Web: www.falcoecology.co.uk

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LEGEND

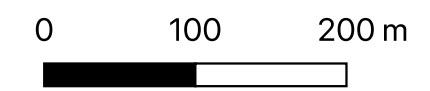
UK Amber List Species

○ Singing

◇ Nests

▭ Indicative site boundary

OpenStreetMap



REV.	Details	DRA	CHD	APP	DATE
RO	Final	AJG	AJG	AJG	13.10.21
R1					

Client	Harris Lamb Property Consultants Ltd.
Project	Land north of A422
Title	Approximate Central Location of Territories for Amber List Species
Figure Number	4
Scale	1:5,000 @A3
Document Reference	FE-019-200-023-500-D-02



18 Moorside, Great Lime Road, West Moor, Newcastle upon Tyne, NE12 7NL
 Tel: 07928040460
 Email: adrian@falcoecology.co.uk
 Web: www.falcoecology.co.uk

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Appendix 2 – Vernacular English bird names, scientific bird names & conservation status.



British (English) vernacular name 2021	Scientific name 2021	Conservation Status
Pheasant	<i>Phasianus colchicus</i>	Not Assessed
Swift	<i>Apus apus</i>	Amber
Cuckoo	<i>Cuculus canorus</i>	Red; Sec41
Stock Dove	<i>Columba oenas</i>	Amber
Woodpigeon	<i>Columba palumbus</i>	Green
Little Ringed Plover	<i>Charadrius dubius</i>	Green; Sch1.1
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Amber
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber
Red Kite	<i>Milvus milvus</i>	Green; Sch1.1 & 1A; Ann1
Buzzard	<i>Buteo buteo</i>	Green
Little Owl	<i>Athene noctua</i>	Not Assessed
Great Spotted Woodpecker	<i>Dendrocopos major</i>	Green
Green Woodpecker	<i>Picus viridis</i>	Green
Kestrel	<i>Falco tinnunculus</i>	Amber
Peregrine	<i>Falco peregrinus</i>	Green; Sch1.1; Ann1
Jay	<i>Garrulus glandarius</i>	Green
Magpie	<i>Pica pica</i>	Green
Jackdaw	<i>Coloeus monedula</i>	Green
Carrion Crow	<i>Corvus corone</i>	Green
Raven	<i>Corvus corax</i>	Green
Coal Tit	<i>Parus ater</i>	Green
Blue Tit	<i>Cyanistes caeruleus</i>	Green
Great Tit	<i>Parus major</i>	Green
Skylark	<i>Alauda arvensis</i>	Red; Sec41
Long-tailed Tit	<i>Aegithalos caudatus</i>	Green
Chiffchaff	<i>Phylloscopus collybita</i>	Green
Blackcap	<i>Sylvia atricapilla</i>	Green
Whitethroat	<i>Curruca communis</i>	Green
Wren	<i>Troglodytes troglodytes</i>	Green
Treecreeper	<i>Certhia familiaris</i>	Green
Starling	<i>Sturnus vulgaris</i>	Red; Sec41
Blackbird	<i>Turdus merula</i>	Green
Song Thrush	<i>Turdus philomelos</i>	Red; Sec41
Mistle Thrush	<i>Turdus viscivorus</i>	Red



British (English) vernacular name 2021	Scientific name 2021	Conservation Status
Robin	<i>Erithacus rubecula</i>	Green
Dunnoek	<i>Prunella modularis</i>	Amber; Sec41
Pied Wagtail	<i>Motacilla alba yarellii</i>	Green
Chaffinch	<i>Fringilla coelebs</i>	Green
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber; Sec41
Greenfinch	<i>Chloris chloris</i>	Green
Linnet	<i>Linaria cannabina</i>	Red; Sec41
Goldfinch	<i>Carduelis carduelis</i>	Green
Yellowhammer	<i>Emberiza citrinella</i>	Red; Sec41



Appendix 3 – Environmental Legislation & Convention Relating to Birds



Introduction

The UK has ratified several Conventions and implemented legislation pertaining to the protection of bats, either independently or as member state of the European Union. These are defined and summarised below.

Lists of threatened, endangered and extinct species are also provided, together with a summary explanation of each.

Bern Convention (1982)

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and was ratified in 1982. Its aims are to protect wild plants and animals and their habitats listed in Appendices 1 and 2 of the Convention and regulate the exploitation of species listed in Appendix 3. The regulation imposes legal obligations on participating countries to protect more than 1000 animals.

To meet its obligations imposed by the Convention, the European Community adopted the EC Birds Directive (1979) and the EC Habitats Directive (1992 – see below). Since the Lisbon Treaty, in force since 1st December 2009, European legislation has been adopted by the European Union.

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals or 'Bonn Convention' was adopted in Bonn, Germany in 1979 and came into force in 1985. Participating states agree to work together to preserve migratory species and their habitats by providing strict protection to species listed in Appendix I of the Convention. It also establishes agreements for the conservation and management of migratory species listed in Appendix II.

In the UK, the requirements of the convention are implemented via the Wildlife & Countryside Act 1981 (as amended), Wildlife (Northern Ireland) Order 1985, Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 and the Countryside and Rights of Way Act 2000 (CRoW)

The UK has currently ratified four legally binding Agreements under the Convention, one of which is the African-Eurasian Migratory Waterbird Agreement (AEWA) and Agreement on the Conservation of Albatrosses and Petrels (ACAP).

The UK has ratified the Conservation of Migratory Birds of Prey in Africa and Eurasia and the Memorandum of Understanding on the Aquatic Warbler.

National Planning Policy Framework (2021)

Following the publication of the first revision of the National Planning Policy Framework (NPPF) in March 2012, Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (2005) has been withdrawn. However, ODPM 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System (the guidance document that accompanied PPS9) has not been withdrawn and, where more detailed guidance is required than is given within the NPPF, local planning authorities will continue to rely on ODPM 06/2005. The NPPF has been revised and was published in July 2021.

The natural environment is covered within the NPPF 2021 in Chapter 15, paragraphs 174-188.

The purpose of the NPPF is to conserve and enhance the natural environment including:



- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.*

To protect and enhance biodiversity and geodiversity, plans should:

- *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- *promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*

This guidance requires local planning authorities (planning policies and planning decisions) to take account of the conservation of protected species when determining planning applications and makes the presence of a protected species a material consideration when assessing a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Furthermore, the NPPF 2021 still includes the requirement for developments to *improve biodiversity* including ecological *net gain*. In the case of birds, planning policy emphasises that strict statutory provisions apply (including the Conservation of Habitats and Species (Amendment) Regulations 2012), to which a planning authority must have due regard.

Where developments requiring planning permission are likely to impact upon protected species it is necessary that protected species surveys are undertaken and submitted to meet the requirements of paragraph 98 of ODPM Circular 06/2005 which states that:

'The presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.'

Potential Special Protected Areas, possible Special Areas of Conservation, listed or proposed Ramsar site should be given the same protection as fully designated sites.

Species of Principal Importance in England

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions.

The S41 list includes 49 bird species which are primarily designated as UKBAP species.

The Conservation of Habitats and Species (Amendment) (EU exit) Regulations 2019

The Conservation of Habitats and Species (Amendment) (EU exit) Regulations 2019 came into force on 1st February 2020 and ensures that the species and habitat protection and standards derived from EU law will continue to apply during the Brexit transitional period. No alterations have been made within the amendment from the Conservation of Habitats and Species Regulations 2017 consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the



conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales.

Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the Habitats Directive respectively) to the European Commission. These sites, if ratified by the European Commission, are then designated as Special Protection Areas (SPAs) within six years. The 2012 amendments include that public bodies help preserve, maintain and re-establish habitats for wild birds.

Schedule 2 of the 2019 Regulations do not include any avian species.

Wildlife & Countryside Act 1981 (as amended)

Active bird nests are fully protected from deliberate and reckless destruction under the Wildlife & Countryside Act 1981 (as amended) (WCA). This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the 'Bern Convention' and the Birds Directive are implemented in the UK. Since it was first introduced, the Act has been amended several times. In short, the WCA makes it an offence to:

- Intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- intentionally take or destroy the egg of any wild bird; and
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

If convicted of an offence under the WCA then a penalty may be imposed with an unlimited fine and/or up to six months imprisonment per offence.

Appendix 5: Dormouse Survey Report

Huscote Farm, Banbury

Dormouse Survey Report

Date: January 2022

For: Greystoke Land

Ref: C533

Produced By:

Cotswold Ecology Ltd

www.cotswoldecology.co.uk

General Notes

Project No.: C533




Title: Huscote Farm, Banbury – Dormouse Survey Report

Client: Greystoke Land

Date: January 2022

Office: Stroud

Status: Rev 0

Author	<u>James Pattenden</u>	Technical reviewer	_____
Signature		Signature	_____
Date:	<u>19/01/2022</u>	Date:	_____
Project manager	<u>James Pattenden</u>	Quality reviewer	<u>Lisa Collett</u>
Signature		Signature:	
Date:	<u>19/01/2022</u>	Date:	<u>19/01/2022</u>

Cotswold Ecology Ltd has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and Cotswold Ecology Ltd. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by Cotswold Ecology Ltd for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of Cotswold Ecology Ltd.

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Executive Summary

1. This report describes the results of surveys for Dormouse (*Muscardinus avellanarius*) carried out by Cotswold Ecology Ltd at Huscote Farm, Banbury, Oxfordshire, OX16 3AD (Ordnance Survey Grid Reference SP475421 in the centre of the site).
2. Presence/absence Dormouse surveys were carried out including Dormouse nest tube surveys and nut searches. The surveys were carried out according to best practice guidelines (Bright et al. 2006). The 115 nest tubes were deployed on 9th June 2021 and collected on 28th October 2021 and were checked on five occasions. Two nut searches were carried out during the surveys in September and October.
3. No evidence of Dormouse was recorded and it is likely that they are absent from the site. The results mean that no further surveys, mitigation or European Protected Species licence would be required in respect of this species in order for development to proceed.

1 Introduction

1.1 Purpose of the Report

This report describes the results of surveys for Dormouse (*Muscardinus avellanarius*) carried out by Cotswold Ecology Ltd at Huscote Farm, Banbury, Oxfordshire, OX16 3AD (Ordnance Survey Grid Reference SP475421 in the centre of the site). A site location plan is provided in Figure 1.

1.2 Habitat Description

The site is bounded to the west by A361 and to the south by A422, both of which would represent a physical barrier for Dormice to cross. However, there are agricultural fields to the north and east wither hedgerows and woodland blocks which would provide suitable habitat for this species and are connected to the site. The site itself comprises cattle grazed pasture fields separated by hedgerows with both individual and lines of mature trees. There is a small woodland block measuring approximately 1.7 ha in the north-eastern corner of the site. The site boundaries support hedgerows that are generally intact and thick but generally limited in species richness to *Crataegus monogyna* (Hawthorn), *Prunus spinose* (Blackthorn) with *Rosa canina* (Dog-rose) and *Rubus fruticosus* agg. (Bramble). Despite the limited amount of species present, there would be sufficient food source present to sustain a Dormouse population on the site. The thick connected hedgerows and small wooded area would also provide nesting and hibernation opportunities.

1.3 Structure of the Report

The remainder of this report is structured as follows:

- Section 2 describes the survey and assessment methods and constraints;
- Section 3 presents the survey results and conclusions;
- Section 5 lists the references; and
- Section 6 provides figures.

2 Methods

2.1 Nest Tube Survey

Dormouse surveys were carried out according to best practice guidelines set out in the Dormouse Conservation Handbook (Bright et al., 2006).

The site was surveyed for the presence of Dormouse by installing 110 nest tubes within suitable hedgerow and woodland habitat. Tubes were located approximately 20 m apart and were fixed underneath horizontal branches with entrances facing the centre of the tree. The tubes were located in the most suitable habitat for Dormouse and in areas less likely to be interfered with by cattle present in all numbers in the fields. A plan of the hedgerows surveyed for Dormouse is provided in Figure 2.

Dormouse nest tubes are considered an effective means of surveying hedgerows, scrub and other habitat where tree holes and other nesting sites are generally absent. Other species such as Wood Mouse (*Apodemus sylvaticus*) or birds may use Dormouse tubes. However, Dormice build nests that are readily identifiable as they are characteristically woven, often incorporating green leaves.

To provide an indication of the thoroughness of a survey for Dormouse, a score can be derived based on an index of probability of finding Dormouse in any one month as shown in Table 1 below. The overall score may be increased or decreased proportionate to the actual number of tubes deployed within a survey area. A minimum overall score of 20 is required in order to have confidence in a negative (likely absent) result.

The 115 tubes were deployed on 9th June 2021 and collected on 28th October 2021, giving a score of 18. The score is just below the minimum score of 20, although this score is based upon a deployment of 50 tubes. Natural England guidance states that a score can be doubled with double the density of tubes on the site, although it is not good practice to only survey for a short duration with several hundred tubes. The 115 tubes deployed would technically increase the score to 36. In addition, the tubes were in place for 5 months (June to October), including the optimal period of September and were checked monthly (five surveys), which would give good confidence in a negative result.

2.2 Nut Search

A nut search for gnawed hazelnuts, characteristic of Dormouse presence was carried out during the survey at the end of September and October 2021. Hazelnuts were collected from the woodland

areas on the site, where present) which has been opened by small mammals, avoiding caches (as Dormouse do not cache food) and ignoring nuts opened by squirrels. All collected nuts were inspected for the characteristic marks left by Dormice, which leave a smooth round opening with teeth marks at an angle to the hole on the nut surface.

Table 1. Index of Probability of finding Dormice present in nest tubes in any one month (Bright et al., 2006).

Month	Score (Index of Probability) 50 tubes
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2
Total Score	21

2.3 Personnel

Tubes were checked for Dormouse by James Pattenden, Natural England dormouse licence holder (reference 2016-21635-CLS-CLS). James is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has 16 years of experience in ecological consultancy.

2.4 Timings

Survey timings are detailed in Table 2 below.

Table 2. Survey dates

Survey	Survey Date
Tubes Deployed	09.06.21
Tube Check 1	29.06.21
Tube Check 2	21.07.21
Tube Check 3	24.08.21
Tube Check 4, nut search	22.09.21
Tube Check 5, nut search and collection of tubes	28.10.21

2.5 Survey Constraints

Where habitat is optimal, Dormice will favour natural nest sites such as hollow tree branches, old bird's nests etc., which can mean that the artificial nest tubes are not used. Despite this, although it is virtually impossible to prove that Dormice are absent from any area of suitable habitat within their range, an adequate survey will give confidence that any significant populations will have been detected (Bright et al., 2006).

There is not a large amount of Hazel present in the hedgerows and as such, the nut search was restricted in the number of Hazelnuts to be examined. However, the nut search is only considered an additional survey tool to compliment the nest tubes survey, and would not be used as evidence of absence of Dormouse. The limited number of Hazelnuts present would therefore not be a significant constraint on the survey conclusions.

This data can be considered to be accurate for a maximum of 2 years from the survey date. If more than two years elapses prior to commencement of the works, the survey findings should be reviewed and it may be necessary to repeat the surveys in order to ensure up-to-date information.

3 Results and Conclusions

3.1 Survey Results

3.1.1 Nest Tube Survey

No Dormouse nests were recorded during the nest tube surveys. A small number of nest tubes were occupied by Wood Mice nests or contained evidence of Wood Mouse such as food caches.

3.1.2 Nut Search

A survey of the limited number of Hazelnuts used as part of the nut search recorded no nuts that were confirmed as being opened by Dormouse.

3.2 Evaluation and Conclusions

No evidence of Dormouse was recorded. The survey results therefore suggest that this species is absent from the site. The results mean that no further surveys, mitigation or European Protected Species (EPS) development licence would be required in respect of this species in order for development to proceed.

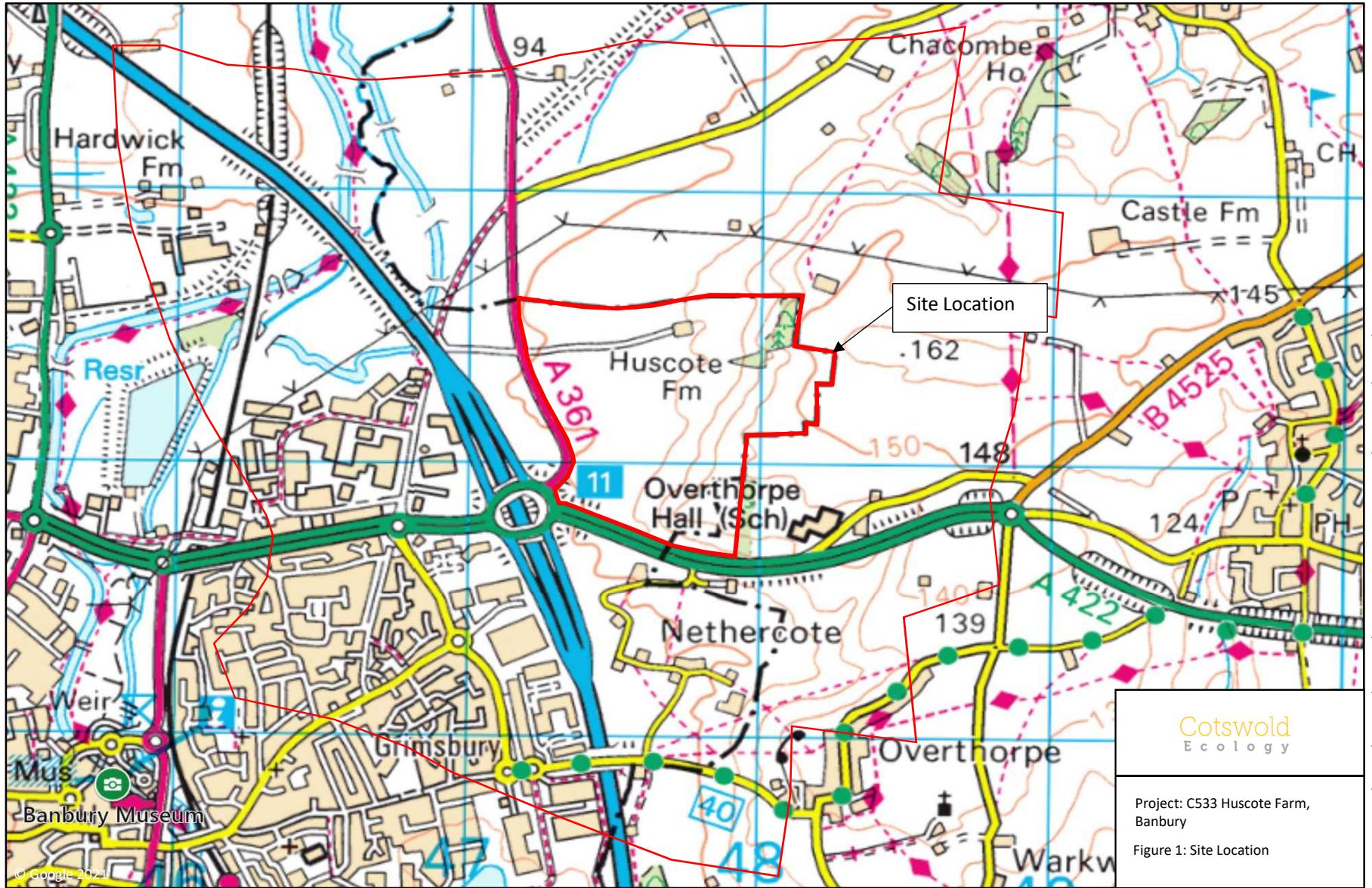
4 References


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English Nature, Peterborough. ISBN-1-85716-219-6

5 Figures and Plates

Figure 1: Site Location

Figure 2: Dormouse Tube Locations




 Project: C533 Huscote Farm, Banbury
 Figure 1: Site Location



Appendix 6: Bat Transect Survey Report



Huscote Farm, Banbury

Bat Activity Survey Report

Date: February 2022

For: Greystoke Land

Ref: C533

Produced By:

Cotswold Ecology Ltd

www.cotswoldecology.co.uk

General Notes

Project No.: C533




Title: Huscote Farm, Banbury –Bat Survey Report

Client: Greystoke Land

Date: February 2022

Office: Stroud

Status: Rev 0

Author	<u>James Pattenden</u>	Technical reviewer	_____
Signature		Signature	_____
Date:	<u>09/02/2022</u>	Date:	_____
Project manager	<u>James Pattenden</u>	Quality reviewer	<u>Lisa Collett</u>
Signature		Signature:	
Date:	<u>09/02/2022</u>	Date:	<u>09/02/2022</u>

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of Cotswold Ecology Ltd.

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Executive Summary

1. This report describes the results of bat activity surveys carried out by Cotswold Ecology Ltd at Huscote Farm, Banbury, Oxfordshire, OX16 3AD (Ordnance Survey Grid Reference SP475421 in the centre of the site). A site location plan is provided in Figure 1, Section 6.
2. Bat transect surveys and static detector surveys were carried out between June and October 2021 in order to identify the levels of bat activity at the site, including species present and levels of use, and to assess the likelihood of roosts being present on site.
3. 10 species were recorded on the site but no rare bat species were recorded.
4. Most of the site is used by bats although lower bat activity levels were recorded on the northern boundary hedgerow and western boundary hedgerow adjacent to the A361. The areas of particular importance to bats on the site were identified as Areas 1-3 on Figure 7, Section 6. These include the central hedgerow lined with mature trees (Area 1) and the wooded areas towards the east of the site (Areas 2 and 3). The hedgerows linking these features are also likely to be important to maintain connectivity between the areas.
5. The identified main areas of bat activity would indicate that the mature trees on the site are likely to be of importance to bat populations on the site as part of commuting routes through the countryside and as a foraging resource. The trees are native and mature with numerous splits, tear outs and cracks present that would appear to provide potential roosting features (PRF) and it is likely that roosts are present in the trees on the site.
6. The results of the bat activity surveys should be analysed in combination with the results of bat surveys on the buildings and trees in order to fully assess impacts and design an appropriate mitigation strategy.

1 Introduction

1.1 Introduction

This report describes the results of bat activity surveys carried out by Cotswold Ecology Ltd at Huscote Farm, Banbury, Oxfordshire, OX16 3AD (Ordnance Survey Grid Reference SP475421 in the centre of the site). A site location plan is provided in Figure 1.

1.2 Site Description

The site is bounded to the west by A361 and to the south by A422. There are agricultural fields to the north and east with hedgerows and woodland blocks. The site itself comprises cattle grazed pasture fields separated by hedgerows with both individual and lines of mature trees. There is a small woodland block measuring approximately 1.7 ha in the north-eastern corner of the site. The site boundaries support hedgerows that are generally intact and thick but managed and generally limited in species richness. However, the hedgerows are generally thick and together with the mature trees, provide good foraging and commuting potential for bats throughout the site. There are a small number of derelict farm buildings and some agricultural shelters that would provide bat roosting opportunities. The mature trees on site are also likely to provide potential roosting features (PRF) for bats.

1.3 Objectives of the Surveys and Report

The aims of the surveys were to identify the levels of bat activity at the site, including species present and levels of use, and to assess the likelihood of roosts being present on site. The information can be used to assess the likely impacts of a potential development on foraging and commuting bats.

1.4 Structure of the Report

The remainder of this report is structured as follows:

- Section 2 describes the survey and assessment methods;
- Section 3 presents the survey results;
- Section 4 gives an evaluation of the results;
- Section 5 lists the references;

- Section 6 provides figures; and
- Appendix 1 provides the detailed results tables of the static detector surveys.

2 Methods

The surveys involved walked transect surveys and the deployment of static bat detectors. Surveys were based on methods to assess bat activity on potential development sites as detailed in best practice guidelines (Collins, 2016).

2.1 Transect Surveys

2.1.1 General

The transect surveys involved walking pre-determined transects at a constant speed using bat detectors. The transects were designed to provide a balanced overview of bat activity across the entire site. Transects were walked in reverse from the previous month in order to record bat activity across the site at different periods in the evening. In order to cover the site in detail without making the transects too long or too short, three transect routes were chosen. These were adjusted when necessary in order to avoid contact with cattle (young bulls) present in the fields for health and safety reasons. However, if a field edge was not able to be walked due to the cattle, the other side of the hedgerow was usually able to be walked. There were only a small number of occasions when all field edges were not able to be surveyed.

2.1.2 Personnel

Three surveyors carried out each transect survey (one for each of the three transect routes per month) led by James Pattenden, Natural England bat licence holder (Class 2 licence number 2015-106-CLS-CLS) and CL21 Registered Consultant (including Annex D for Lesser Horseshoe Bats). James is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) with 16 years of experience in ecological consultancy. All assistants used were trained and experienced in the use of bat detectors and bat surveying.

2.1.3 Equipment

Surveyors used Echo Meter Touch Pro and Elekon Batlogger M bat detectors to listen and view the echolocations of bats during the surveys. Echolocations were recorded and if required, later analysed using BatSound, Bat Explorer and Kaleidoscope Pro software.

2.1.4 Timings and Weather

A monthly transect survey was carried out between June and October 2021. Due to late instruction, surveys in April and May were not able to be carried out. Surveys in June and July were carried out to include the bat breeding period (mid-May to August). Weather conditions during the surveys were good for bat activity and are shown in Table 1 below. All timings were based on best practice guidelines (Collins, 2016).

Table 1. Dates, timings and weather conditions for bat activity transect surveys.

Survey Month	June		July		August		September		October	
Date	10.06.21		21.07.15		24.08.21		22.09.21		21.10.21	
Sunset Time	21:24		20:17		20:11		19:04		17:59	
	Start	End	Start	End	Start	End	Start	End	Start	End
Survey Time	21:20	23:33	20:15	22:20	20:11	22:15	19:04	21:05	17:59	20:00
Temperature(°C)	20	19	21	19	16	15	18	16	8	8
Cloud (Octas)	8	8	0	0	1	1	1	1	4	3
Wind (Beaufort)	1	3	1	1	2	2	2	2	2	2
Precipitation	None		None		None		None		None	
General	Warm but overcast with fresh breeze at end of the survey		Very hot week (>30°C in the day)		Light cloud and a gentle breeze		Dry following week of showers		Cold, clear and calm	

2.2 Static Detector Surveys

2.2.1 General

Three static detectors (Wildlife Acoustic Song Meter Mini) were deployed on the site per month in all areas of the site in order to obtain an appraisal of bat activity across the site. Within the areas, locations of the static detectors were chosen based on those locations most likely to be used by foraging and commuting bats and locations where static detectors were able to be deployed without interference from cattle. Locations are shown in Figure 4.

2.2.2 Equipment

During June and July, two Song Meter (SM) Mini detectors and one SM2 detector were deployed. Following the destruction of the SM2 detector by cattle during the July survey, three SM Mini detectors were deployed in August, September and October. Recordings made were subsequently analysed using Kaleidoscope Pro software and bat species and the number of passes were identified.

2.2.3 Timings

The static detector surveys were completed monthly between June and October 2021, between 7 and 12 nights per month, as shown in Table 2. The detectors were programmed to begin recording 30 minutes before sunset and cease recording 30 minutes after sunrise each night. Weather conditions during the surveys were generally good for bat activity and bats were recorded on all nights surveyed.

Table 2 –Timings and temperatures during static detector surveys

Date Deployed	Date Collected	No. of Survey Nights	Nightly Temperature Range (°C)
09.06.21	17.06.21	8	09.06.21: 16-21°C 10.06.21: 17-21°C 11.06.21: 12-18.25°C 12.06.21: 12-26°C 13.06.21: 15-24°C 14.06.21: 10-18°C 15.06.21: 15-28°C 16.06.21: 15-25°C
21.07.21	01.08.21	11	21.07.21: 16-28°C 22.07.21: 16-27°C 23.07.21: 15-19°C 24.07.21: 16-19°C 25.07.21: 16-19°C 26.07.21: 18-23°C 27.07.21: 16-18°C 28.07.21: 12-17°C 29.07.21: 15-19°C 30.07.21: 14-15°C 31.07.21: 15-16°C
01.08.21	13.08.21	12	01.08.21: 12-18°C 02.08.21: 11-15°C 03.08.21: 14-17°C 04.08.21: 13-19°C 05.08.21: 15-16°C 06.08.21: 13-17°C 07.08.21: 14-17°C 08.08.21: 14-17°C 09.08.21: 13-16°C 10.08.21: 13-20°C 11.08.21: 14-19°C 12.08.21: 16-20°C
08.09.21	20.09.21	11	08.09.21: 16-27°C 09.09.21: 17-19°C 10.09.21: 16-19°C 11.09.21: 13-19°C 12.09.21: 13-18°C 13.09.21: 14-18°C 14.09.21: 14-16°C 15.09.21: 11-18°C 16.09.21: 12-21°C 17.09.21: 13-19°C 19.09.21: 13-20°C
21.10.21	28.10.21	7	21.10.21: 8-13°C 22.10.21: 8-9°C 23.10.21: 10-12°C 24.10.21: 11-12°C 25.10.21: 10-13°C 26.10.21: 14-15°C

			27.10.21: 13-14°C
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2.3 Survey Constraints

2.3.1 General

This data can be considered to be accurate for a maximum of 2 years from the survey date. If more than two years elapses prior to commencement of the works, the survey data should be reviewed together with the latest proposals. It may then be advisable to conduct further surveys to ensure up-to-date information.

2.3.2 Dusk Transect Surveys and Static Detectors

Static bat detectors occasionally malfunction partly due to user or technical errors. The surveys aimed to ensure any user errors were minimised by using trained and experienced surveyors to deploy and retrieve static detectors. In addition, three detectors were deployed each month to ensure at least some data was collected throughout the site each month. On one occasion, the SM2 detector deployed in July (Location 6) was damaged by cattle and the data was not retrievable. The static detector at Location 7 also failed due to an issue with the hardware in the recorder. All other static detector surveys collected data without constraint.

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. For example, a call from a Lesser Horseshoe Bat is directional and a bat detector will only be able to record the call if the bat echolocates directly at the detector whereas a Common Pipistrelle call is less directional and can be recorded even when the call is aimed away from the microphone. This can result in certain bat species (such as Lesser Horseshoe Bat and Brown Long-eared Bat) being under-recorded due to the limitations of current bat detectors. The difference in recording efficiency may therefore bias any results and this has been taken into account where possible during any assessment of the results.

Temperatures were low (8-9°C) on one night during the static detector surveys in October. Bats were still recorded on this evening by the static detectors, although it is acknowledged that activity would be lower given the temperatures on site. Six other surveys nights were surveyed in October and as such, one night of lower temperatures is not considered a significant constraint.

Temperatures were also relatively low (8°C) during the transect survey in October, although bats

were recorded during the survey, it is acknowledged that activity is likely to have been lower than during other nights in October. Given that data was collected during optimal weather conditions from the June-September transect surveys, sufficient information has been collected to make an assessment of bat activity across the site, even without the October survey data. As a result, the sub-optimal temperatures in October are not considered to represent a significant constraint on the conclusions of the assessment.

2.3.3 Kaleidoscope Pro Analysis

The calls recorded by the static detectors have been analysed using the latest Kaleidoscope Pro automated analysis software. This software has been specifically designed to automatically classify the known bat calls of Britain and Ireland.

The programme automatically identifies bat calls using algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect the fact that there will be certain classification errors related to every classified bat call. With experience of using the software it is, on the whole, reliable when identifying certain bat calls (Common Pipistrelle, Soprano Pipistrelle, Noctule, Serotine, Leisler's Bat, Lesser Horseshoe Bat and Greater Horseshoe Bat) but less reliable when identifying other species (Brown Long-eared Bat and Barbastelle species).

The software cannot always distinguish between the various *Myotis* species and, in this case 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. Where confidence levels are higher a species is attributed to a call, which has been used during the analysis of the data collected to determine the number of species recorded.

From experience of using the software, it appears that various species of bat are either under or over recorded and classifications can be inaccurate. Steps have been taken to compensate for this inaccuracy. All records of Barbastelle, *Myotis* and Brown Long-eared Bat identified by the automated software have been manually verified and where appropriate the call identified corrected.

Where the software is unsure of a bat call, it will classify the call as 'NoID'. All NoID calls were checked and the correct species identified.

In conclusion, the classification data produced from Kaleidoscope Pro, along with any manual verification of certain problem/important species, is considered to provide an accurate record of the bat species recorded by a static bat detector and as such has been used within this report.

3 Results

3.1 Transect Surveys

Transect survey results for each month are provided in Figures 5a-e, Section 6 with a summary of all months provided in Figure 6, Section 6. Table 3 below provides a summary of the bat species and the total number of bat passes (foraging and commuting) recorded during the transect surveys. Figure 3.1 below provides a graph showing the total no of bat passes per month. Figure 3.2 shows the total number of passes per species recorded during all transect survey between June and October 2021. Detailed observations from each surveyor, from each survey have not been included in this report, but can be made available upon request.

Table 3. Summary of transect survey results.

Species	Month and No. of Bat Passes Recorded per species					
	June	July	August	September	October	Total
Common Pipistrelle	169	73	127	176	-	545
Soprano Pipistrelle	29	40	29	19	10	127
Noctule	54	24	49	173	-	300
Leisler's Bat	14	3	27	45	2	91
Brown Long-eared Bat	2	-	4	2	-	8
Myotis sp.	1	10	5	-	-	16
Total no. of passes	269	150	241	415	12	1087

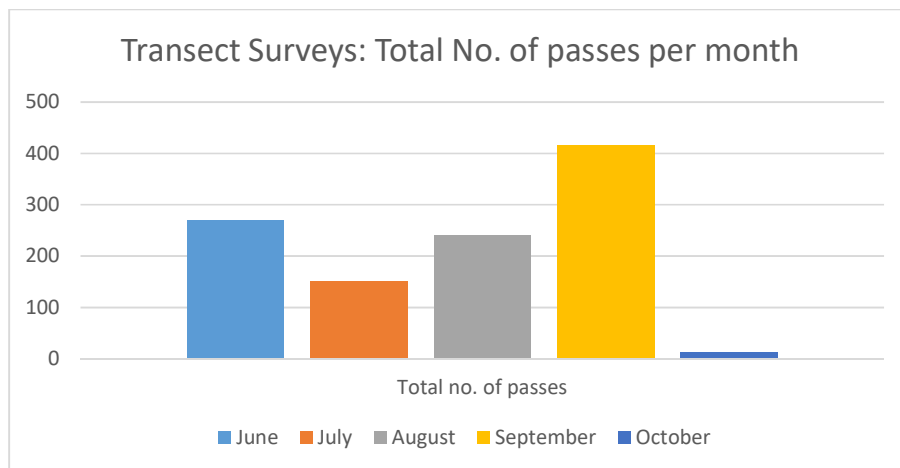


Figure 3.1. Total number of passes recorded during each transect survey between June and October 2021.

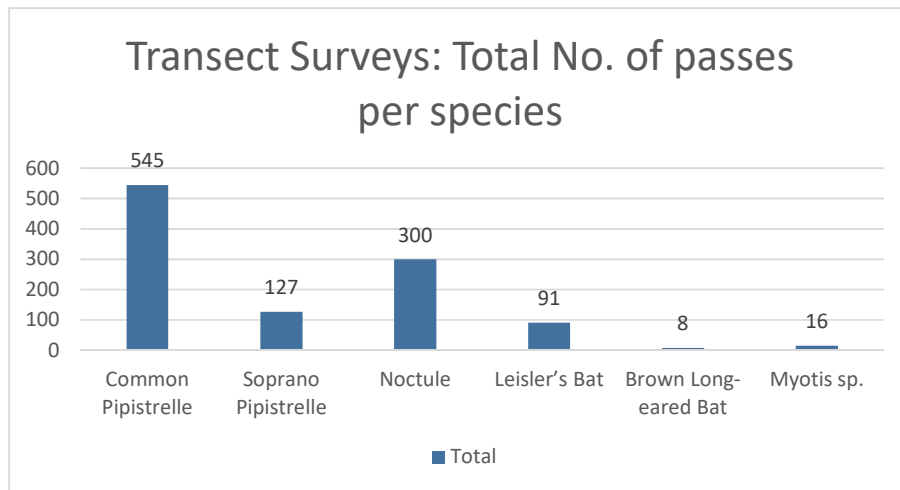


Figure 3.2. Total number of passes per species recorded during all transect survey between June and October 2021.

At least 6 species were recorded during the transect surveys although this number includes *Myotis* bat species and so is likely to be up to 9 species. Common Pipistrelle was by far the most frequently recorded species (total of 545 recordings) followed by Noctule passes (300), with much lower numbers of Soprano Pipistrelle and Leisler's Bat. The remaining species were infrequently encountered or rarely, including Brown Long-eared Bat. However, this could be due to the difficulties in detecting this species due to their short range calls, as discussed in the constraints section and does not reflect the likely occurrence of this species. No rare bat species such as Barbastelle were recorded on the site during the transect surveys.

Noctule encounters were distributed throughout the site, probably due to their behavioural pattern of flying high over fields with a loud echolocation. Surveyors would be able to pick up this species from several fields away. It is therefore possible that individual bats were recorded by multiple surveyors and would account for the high numbers of passes recorded during transect surveys.

As discussed in the constraints section, activity was very low in the October survey due to the relatively cold temperatures during the survey.

Figure 6, Section 6 shows that most of the hedgerows on the site were used by bats, but that some areas of the site appear to be used more significantly, particularly the areas associated with mature trees. These main areas of bat activity are shown as Areas 1-3 on Figure 7, Section 6. Area 1 is a hedgerow that has been fenced off from browsing cattle. The hedgerow contains several mature Oak trees and connects to woodland in the north-east of the site. Area 1a in Figure 7 was

particularly active with several transects recording Common Pipistrelle foraging around the trees at this location. This area also connects hedgerows leading north to south and east to west and so may also be used by bats commuting through the site.

3.2 Static Detector Surveys

Summarised tables containing numbers of passes for each species recorded for each location are provided in Appendix 1. The results are discussed below looking at both the distribution of bat activity across the site and an assessment of the species composition.

3.2.1 Distribution of Bat Activity

A summary of the static detector tables in Appendix 1 is provided in Table 4 on the following page with average passes per night displayed on Figure 3.2.1 below. Static detector locations are provided in Figure 4, Section 6.

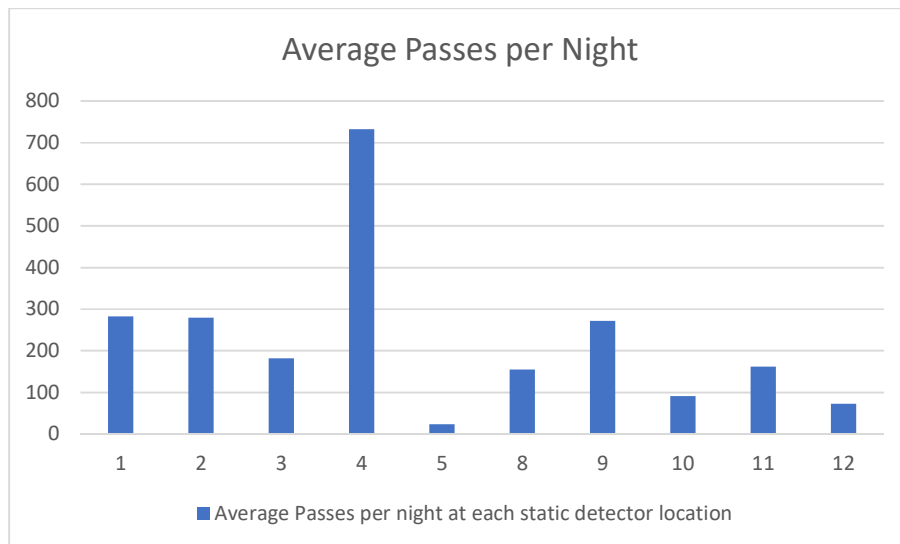


Figure 3.2.1. Average number of passes per night for each static detector. Locations are shown on Figure 4.

Table 4. Summary of static detector survey results.

Dates	Location	No. of Species	Total No. Bat Passes	Average Passes per night
09.06.21 – 17.06.21 (8 nights)	1	6	2262	283
09.06.21 – 17.06.21 (8 nights)	2	7	2236	280
09.06.21 – 17.06.21 (8 nights)	3	7	855	182
21.07.21– 01.08.21 (23 nights)	4	8	16816	732
21.07.21– 01.08.21 (23 nights)	5	5	552	24
08.09.21 – 20.09.21 (11 nights)	8	8	1701	155
08.09.21 – 20.09.21 (11 nights)	9	7	2991	272
21.10.21 – 28.10.21 (7 nights)	10	8	639	91
21.10.21 – 28.10.21 (7 nights)	11	7	1133	162
21.10.21 – 28.10.21 (7 nights)	12	7	511	73
Total			23318	2254

The static detectors only count bat passes and do not differentiate between commuting and foraging behaviour. As a result, a single bat passing the detector on multiple occasions whilst foraging would result in a spike in the number of passes on a detector, which is likely to be the case for Location 4 where an average of 732 passes per night were recorded (including 12,676 passes of Common Pipistrelle). The hedgerow on which Location 4 was deployed was also confirmed as being used by significant numbers of foraging Common Pipistrelles during the transect surveys.

The number of passes was unexpectedly high at Location 9 in September. The area is located adjacent to the M40 junction which is brightly illuminated by streetlights with limited obvious linkage to bat foraging areas. This is due to the high number of Noctule passes recorded, (1485 passes, an average of 212 per night), more than any other species at this location. The transect surveys also recorded Noctules foraging close to the boundary vegetation in this location during the June survey and it is possible that a Noctule roost is located close to this location.

The number of passes per night were relatively low at Location 5 in July and August, despite the other detectors on site recording good levels of bat activity. The results indicate the northern hedgerow where the static detector was deployed is not used extensively by bats.

The number of passes recorded was relatively low in October, but this is more likely to be a result of lower temperatures during the survey period than the locations of the detectors.

3.2.2 Species Composition

The bat species recorded by the static detectors were as follows:

- Common Pipistrelle;
- Soprano Pipistrelle;
- Noctule;
- Serotine;
- Leisler's Bat;
- Brown Long-eared Bat; and
- Myotis sp.

Total numbers of passes per species is shown in Table 5 below and Figure 3.2.2 on the following page.

Table 5. Number of passes per species across all static detectors, June-October 2021.

Species	Total Number of Passes	Total Number of Passes (% of total)
Common Pipistrelle	22072	72.87
Soprano Pipistrelle	5121	16.91
Noctule	2503	8.26
Serotine	60	0.20
Leisler's Bat	223	0.74
Brown Long-eared Bat	179	0.59
Myotis sp.	132	0.44

The majority of calls (90%) were from Common or Soprano Pipistrelle which are both common species and not unexpected in the habitats present on site.

Nyctalus species (mostly Noctule) accounted for 2786 passes, although as previously discussed, 1485 of these passes (53%) were recorded at Location 9 in September, indicating a possible roost close to this location. As discussed in the results of the transect surveys, due to their behavioural pattern of

flying high over fields with a loud echolocation, it is possible that individual bats were recorded by multiple detectors and would account for the high numbers of passes recorded during the static surveys.

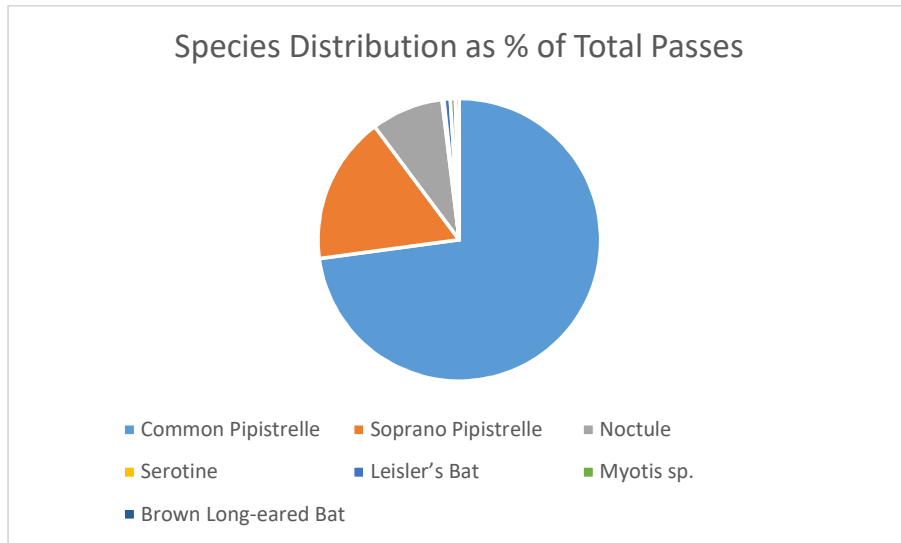


Figure 3.2.2 Passes per species as percentage of total number of passes.

Myotis calls were identified by Kaleidoscope Pro software shown in Table 6. 34 of the 56 Natterer's Bat passes (61%) were recorded at Location 11 in October. Similarly, 34 of the 77 Daubenton's Bat passes (44%) were recorded at Location 9 in September. These two areas may have been the result of individual bats foraging repeatedly in the same area for a prolonged duration. Although the number of calls are still relatively small, the areas may be significant in the site context for Myotis species.

Table 6. Number of *Myotis* passes per species across all static detectors, June-October 2021, as identified by Kaleidoscope Pro software classifiers.

Myotis Species	Number of Passes
Natterer's Bat	56
Daubenton's Bat	77
Whiskered Bat.	24
Brandt's Bat	18

A small number of calls were identified by Kaleidoscope Pro software as Barbastelle and Nathusius Pipistrelle although these were subsequently analysed individually and were discounted as noise or reclassified as other species. As previously discussed in the constraints section, the number of Brown Long-eared Bat calls may well be under recorded due to their quiet and directional calls.

In summary the number of species present indicates that the site is used by at least 10 species. No rare species were recorded. The site is therefore considered to have importance to the local bat population, but unlikely to be of significance on a county level.

4 Summary and Recommendations

4.1 Summary of Evidence

The surveys indicate that the site has some importance to the local bat population, but unlikely to be of significance on a county level. Most of the site is used by bats although lower bat activity levels were recorded on the northern boundary hedgerow and western boundary hedgerow adjacent to the A361.

The areas of particular importance to bats on the site were identified as Areas 1-3 on Figure 7, Section 6. These include the central hedgerow lined with mature trees (Area 1) and the wooded areas towards the east of the site (Areas 2 and 3). The hedgerows linking these features are also likely to be important to maintain connectivity between the areas.

The identified main areas of bat activity would indicate that the mature trees on the site are likely to be of importance to bat populations on the site as part of commuting routes through the countryside and as a foraging resource. The trees are native and mature with numerous splits, tear outs and cracks present that would appear to provide potential roosting features (PRF) and it is likely that roosts are present in the trees on the site.

The impacts to the site would be dependent on the proposals which were not known at the time of writing. The results of the bat activity surveys should be analysed in combination with the results of bat surveys on the buildings and trees in order to fully assess impacts and design an appropriate mitigation strategy.

5 References

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.

6 Figures and Plates

Figure 1: Site Location Plan

Figure 2. Survey Area


Figure 3. Transect Survey Routes

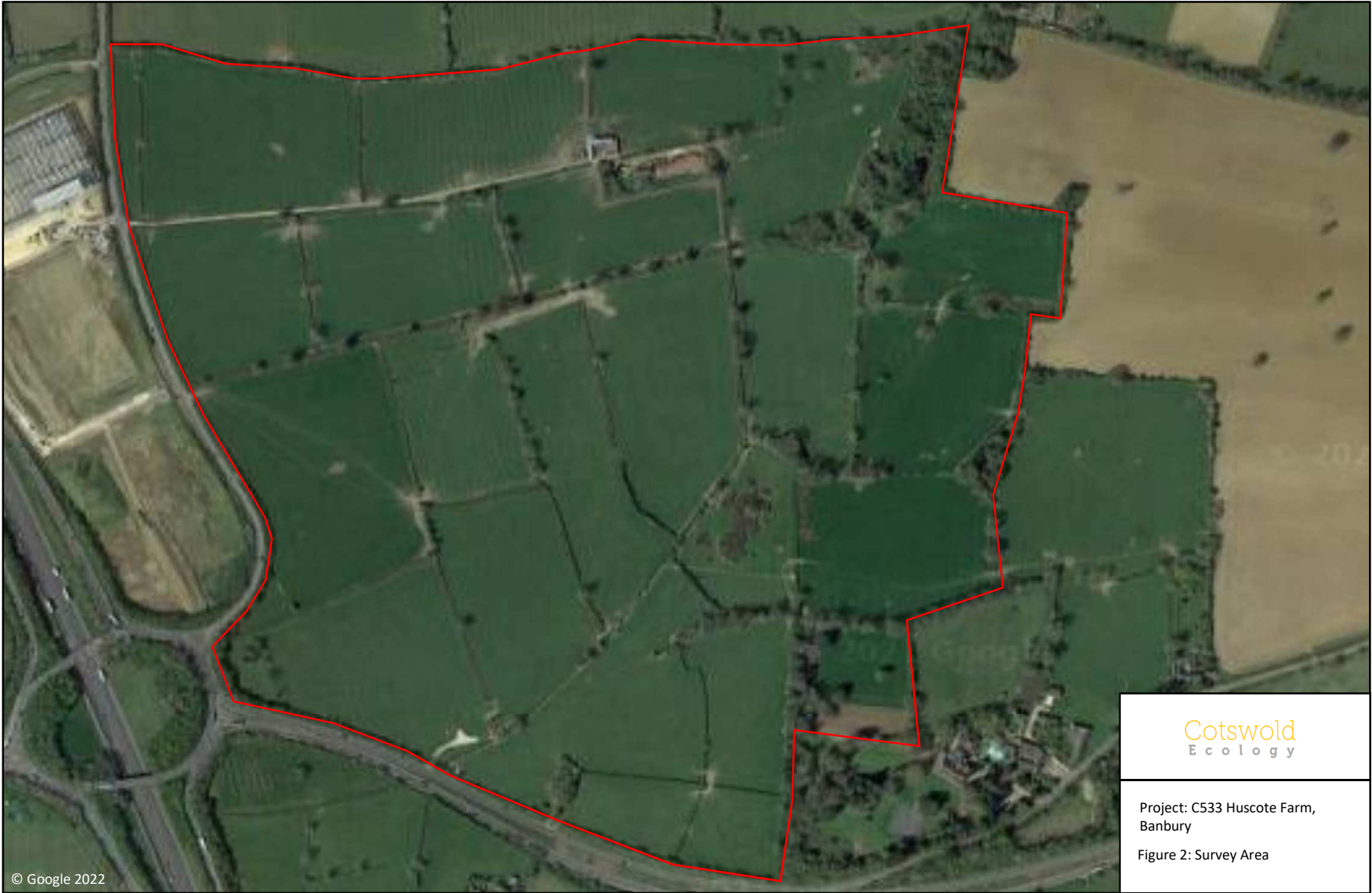
Figure 4. Static Detector Location Plan

Figures 5a-e. Transect Surey Results - June-October 2021

Figure 6. Transect Surveys Results – All Months




 Project: C533 Huscote Farm, Banbury
 Figure 1: Site Location



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Banbury

Figure 2: Survey Area





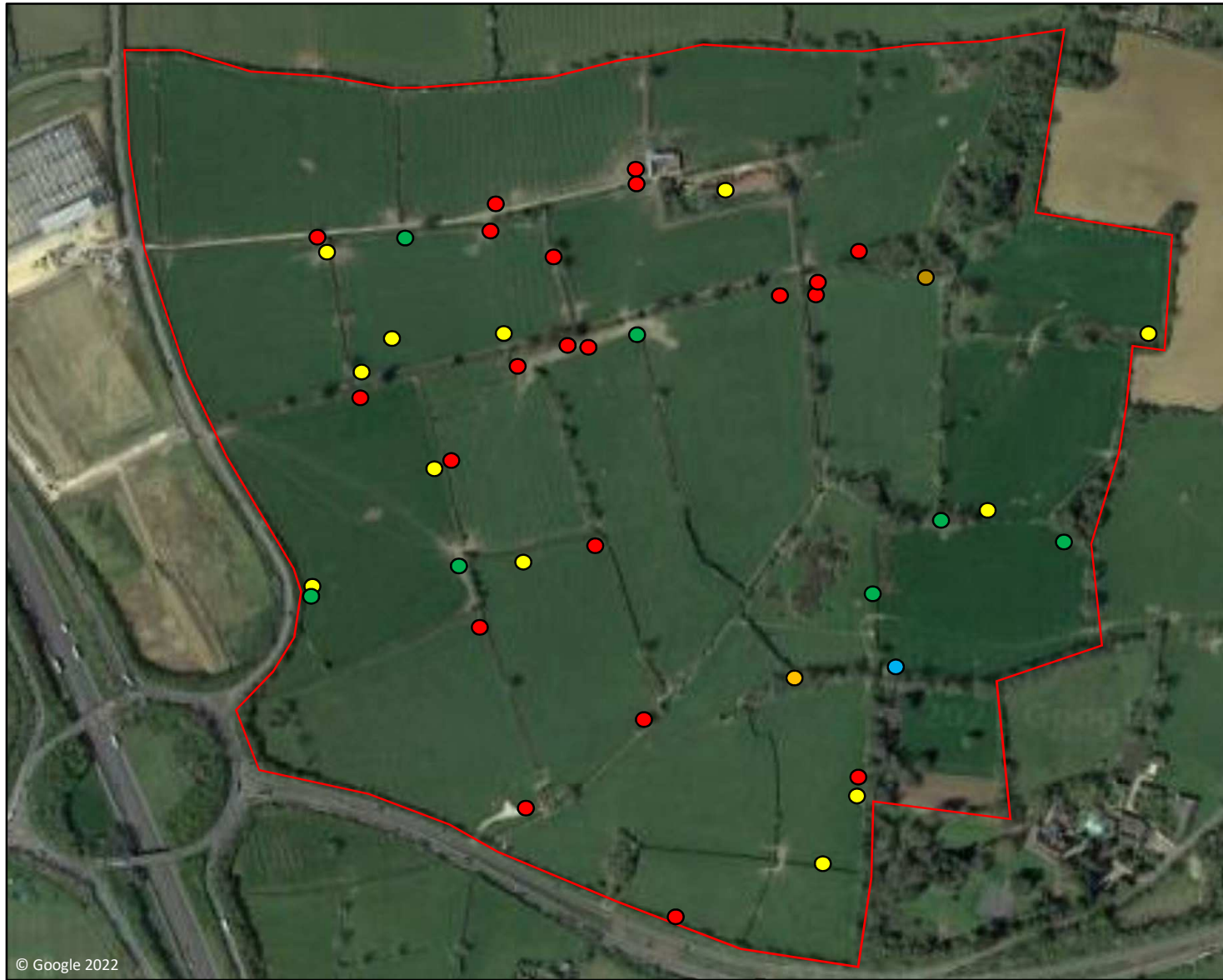
- Key:
- ▶ June Static Deployment – 09.06.21-17.06.21 (8 nights)
 - ▶ July and August Static Deployment – 21.07.21-01.08.21 (11 nights) and 01.08.21-13.08.21 (12 nights)
 - ▶ September Static Deployment – 08.09.21-20.09.21 (11 nights)
 - ▶ October Static Deployment – 21.10.21-28.10.21 (7 nights)

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 Figure 4: Static Detector Location Plan

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Key:

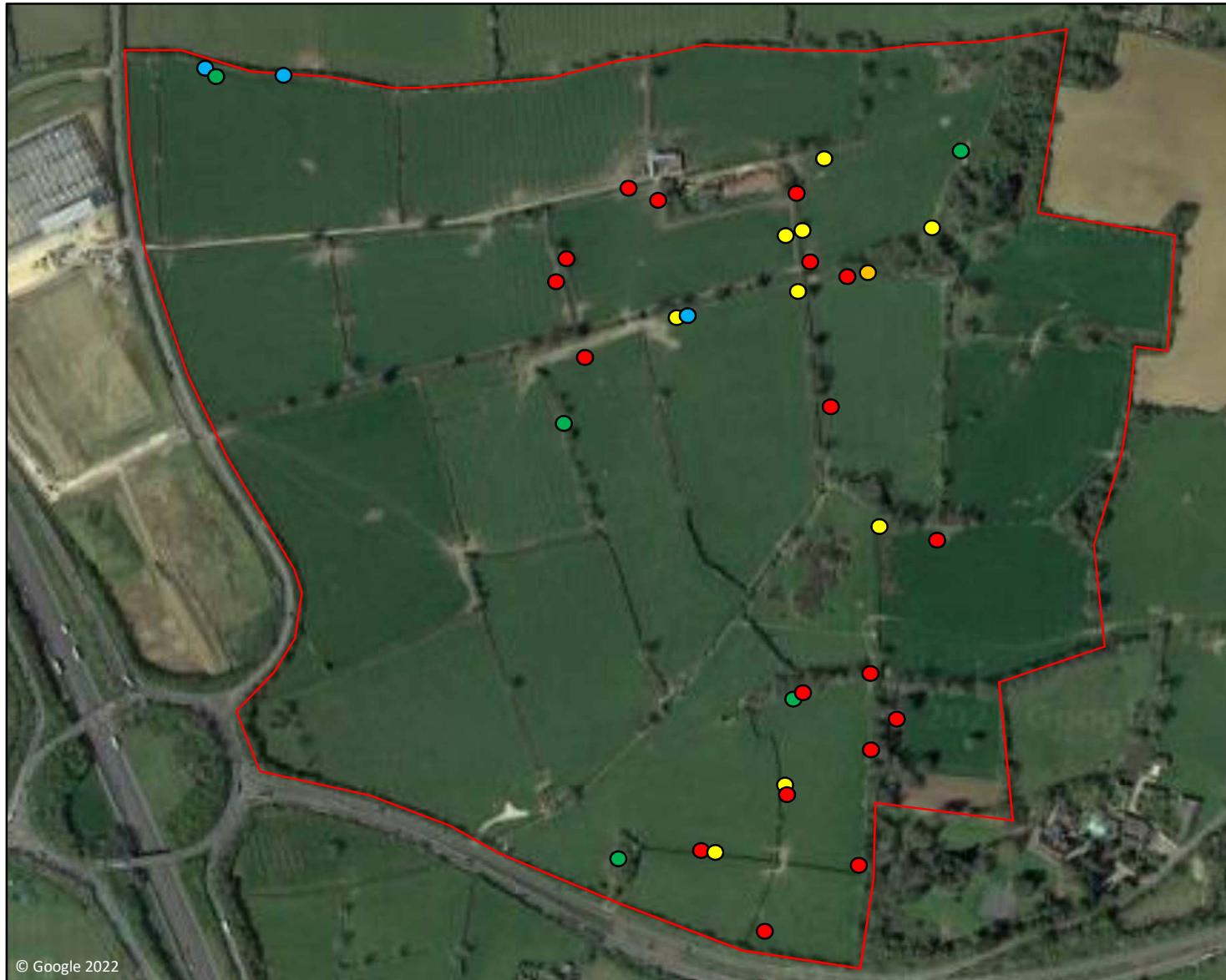
- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.
- Brown Long-eared Bat
- Leisler's Bat

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Figure 5a: Transect Survey Results –
June 2021

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Key:

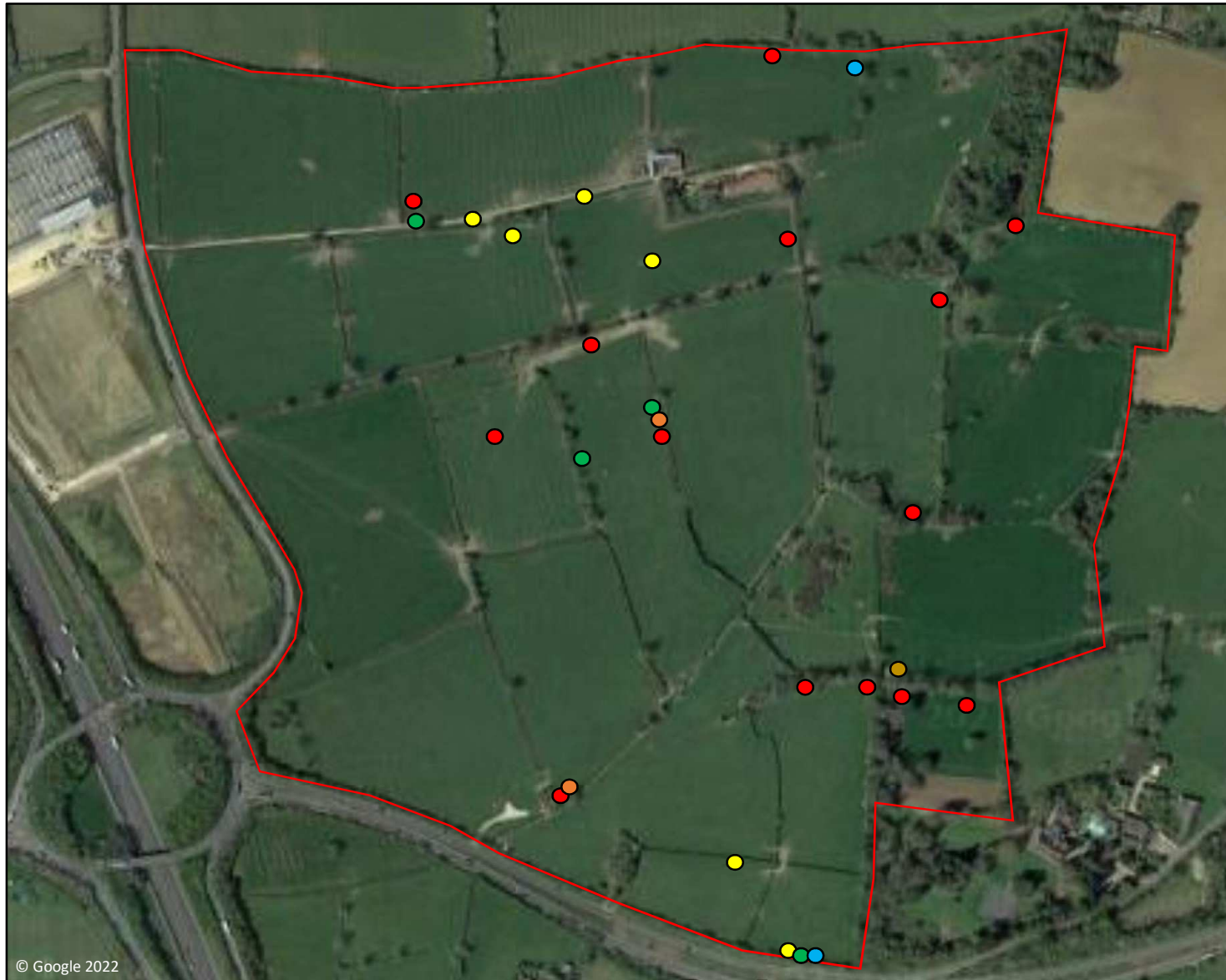
- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.
- Leisler's Bat

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Figure 5b Transect Survey Results –
July 2021

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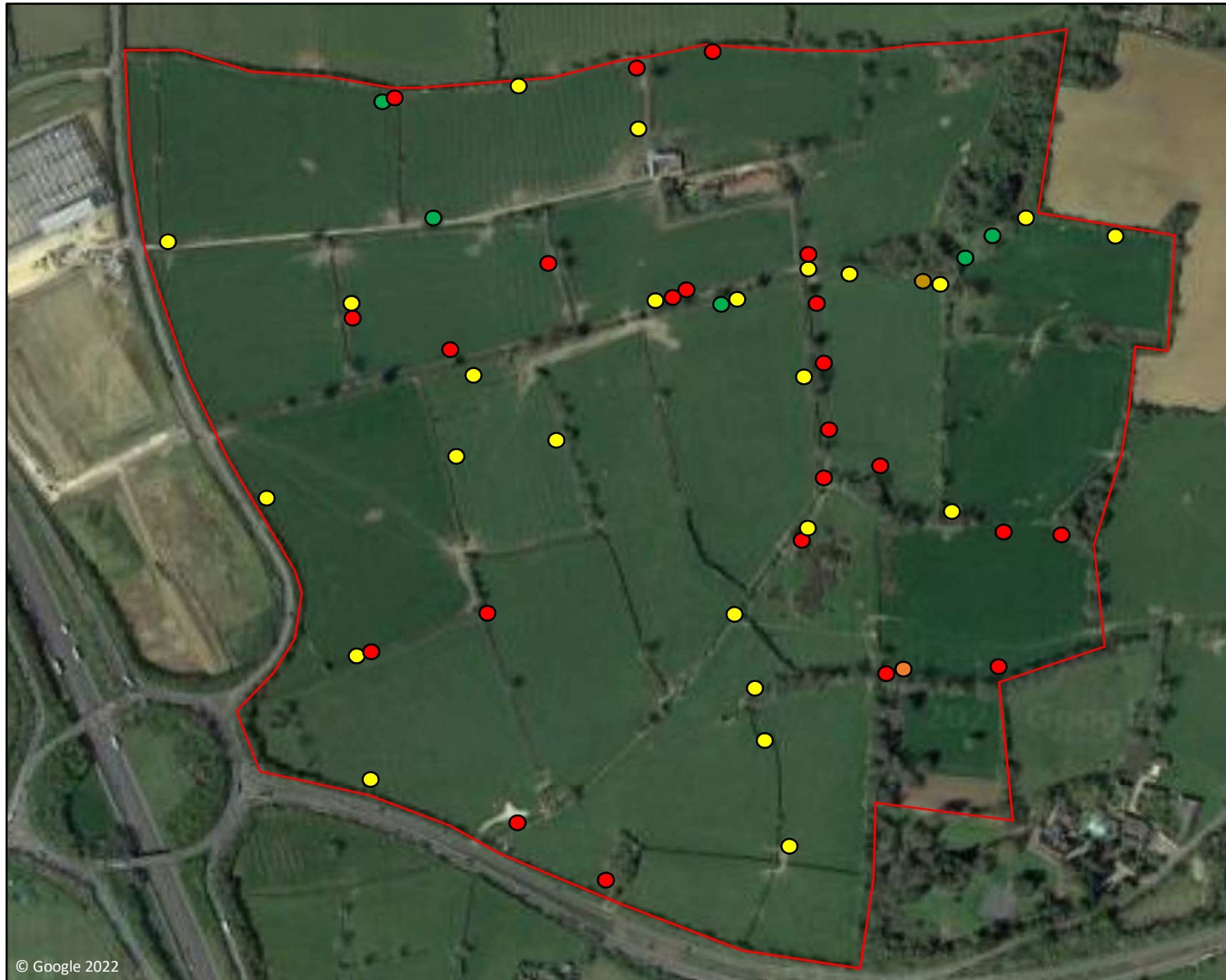
Key:

- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.
- Leisler's Bat
- Brown Long-eared Bat

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Figure 5c Transect Survey Results –
August 2021



Key:

- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.
- Leisler's Bat
- Brown Long-eared Bat

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Figure 5d Transect Survey Results –
September 2021



Key:

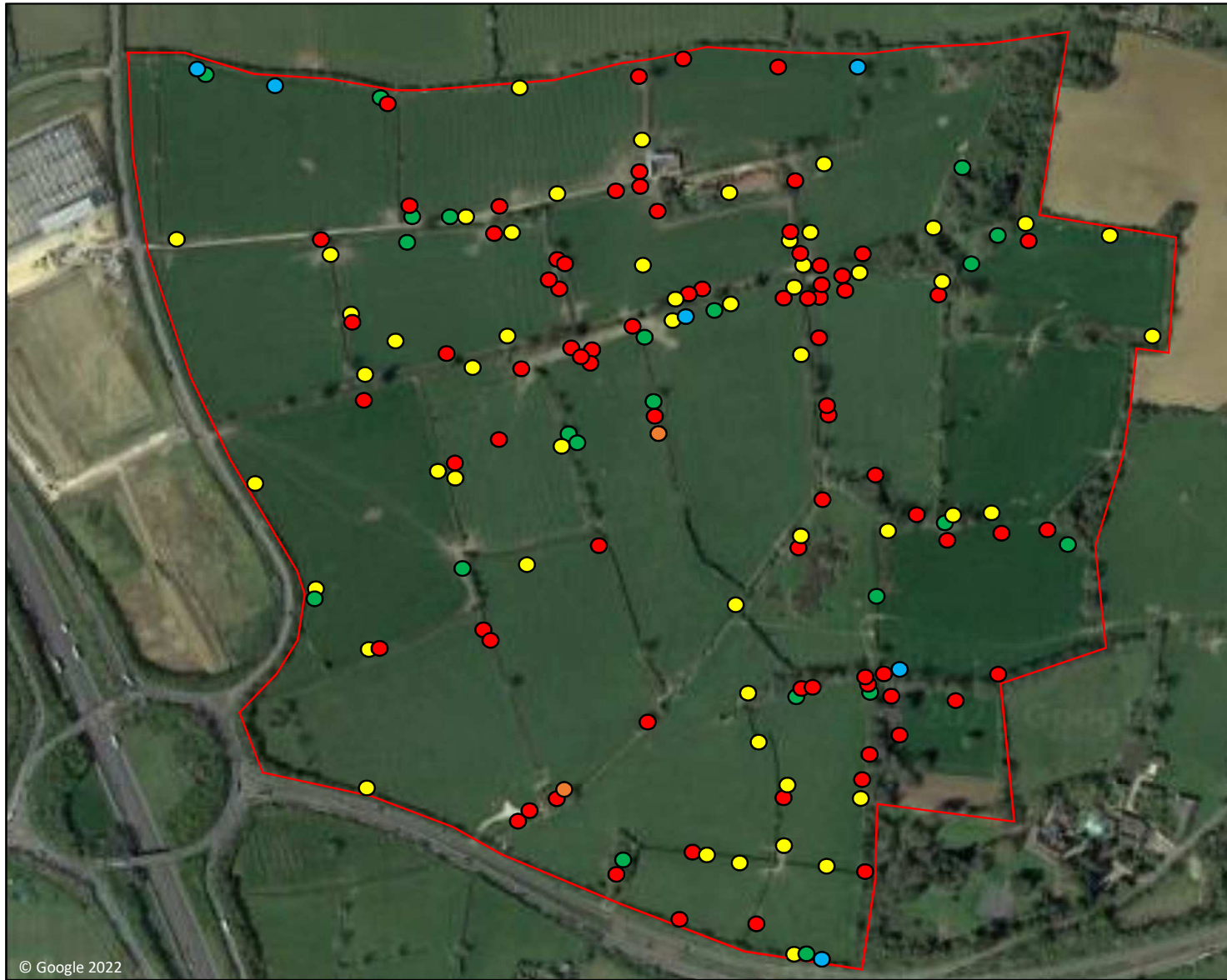
- Soprano Pipistrelle
- Leisler' Bat

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Figure 5e Transect Survey Results –
October 2021

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Key:

- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.
- Leisler's Bat

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Figure 6: Transect Survey Results – All Months June- October 2022



Key:

- Common Pipistrelle
- Soprano Pipistrelle
- Noctule
- Myotis sp.

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Figure 7 Transect Survey Results –
Areas of Main Bat Activity

APPENDIX 1 – Static Detector Survey Results

Detailed Results of the Static Detector Surveys for each month are provided in Tables 1-4 below.

Table 1. June 2021 Static Detector Survey Results – Locations 1-3.

Dates	Location	Total no. bat species / passes recorded	Bat species recorded	No. Passes
09.06.21 – 17.06.21 (8 nights)	1	6 species 2262 passes Average passes per night: 283	Common Pipistrelle	2181
			Soprano Pipistrelle	29
			Noctule	43
			Serotine	1
			Leisler's Bat	0
			Myotis sp.	5
			Brown Long-eared Bat	3
09.06.21 – 17.06.21 (8 nights)	2	7 species 2236 passes Average passes per night: 280	Common Pipistrelle	1987
			Soprano Pipistrelle	108
			Noctule	125
			Serotine	1
			Leisler's Bat	7
			Myotis sp.	2
			Brown Long-eared Bat	6
09.06.21 – 17.06.21 (8 nights)	3	7 species 855 passes Average passes per night: 182	Common Pipistrelle	855
			Soprano Pipistrelle	335
			Noctule	236
			Serotine	4
			Leisler's Bat	9
			Myotis sp.	10
			Brown Long-eared Bat	3

Table 2. July and August 2021 Static Detector Survey Results – Locations 4-5.

Dates	Location	Total no. bat species / passes recorded	Bat species recorded	No. Passes
21.07.21– 01.08.21 (23 nights)	4	8 species 16816 passes Average passes per night: 732	Common Pipistrelle	12676
			Soprano Pipistrelle	3793
			Noctule	230
			Serotine	20
			Leisler’s Bat	41
			Myotis sp.	30
			Brown Long- eared Bat	26
			Barbastelle	2
21.07.21– 01.08.21 (23 nights)	5	5 species 552 passes Average passes per night: 24	Common Pipistrelle	350
			Soprano Pipistrelle	57
			Noctule	130
			Serotine	0
			Leisler’s Bat	9
			Myotis sp.	6
			Brown Long- eared Bat	0

Note. No recordings were retrievable from the static detector at Location 6 in July/August due to the detector being damaged by cattle.

Table 3. September 2021 Static Detector Survey Results – Locations 8 and 9.

Dates	Location	Total no. bat species / passes recorded	Bat species recorded	No. Passes
08.09.21 – 20.09.21 (11 nights)	8	8 species 1701 passes Average passes per night: 155	Common Pipistrelle	1235
			Soprano Pipistrelle	267
			Noctule	117
			Serotine	8
			Leisler’s Bat	12
			Myotis sp.	37
			Brown Long- eared Bat	23
			Barbastelle	2
08.09.21 – 20.09.21 (11 nights)	9	7 species 2991 passes Average passes per night: 272	Common Pipistrelle	963
			Soprano Pipistrelle	303
			Noctule	1485
			Serotine	22
			Leisler’s Bat	137
			Myotis sp.	44
			Brown Long- eared Bat	37

Note: The static detector at Location 7 failed due to an issue with the hardware in the recorder.

Table 4. October 2021 Static Detector Survey Results – Locations 10-12.

Dates	Location	Total no. bat species / passes recorded	Bat species recorded	No. Passes
21.10.21 – 28.10.21 (7 nights)	10	8 species 639 passes Average passes per night: 91	Common Pipistrelle	553
			Soprano Pipistrelle	67
			Noctule	12
			Serotine	3
			Leisler's Bat	1
			Myotis sp.	1
			Brown Long-eared Bat	1
			Barbastelle	1
21.10.21 – 28.10.21 (7 nights)	11	7 species 1133 passes Average passes per night: 162	Common Pipistrelle	910
			Soprano Pipistrelle	156
			Noctule	13
			Serotine	1
			Leisler's Bat	4
			Myotis sp.	42
			Brown Long-eared Bat	7
21.10.21 – 28.10.21 (7 nights)	12	7 species 511 passes Average passes per night: 73	Common Pipistrelle	362
			Soprano Pipistrelle	6
			Noctule	112
			Serotine	
			Leisler's Bat	3
			Myotis sp.	2
			Brown Long-eared Bat	26

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