

APPENDIX 10.1 - LIGHTWOOD STRATEGIC APPLICATION TECHNICAL APPENDIX

Technical Appendix Report

Prior's Farm, Wokingham

July 2024

Ecology | Green Space | Community | GIS

Unit 1, Brassmill Lane Enterprise Centre | Bath | BA1 3JN

01225444114 | info@ethosep.co.uk

www.ethosep.co.uk



Report Produced for **Lightwood Strategic Ltd**

Written by: **Ellie Shearn, Ecologist**

Checked by: **Matthew Attrill, Senior Ecologist**

Approved by: **Jim Phillips, Managing Director**

Issue: **V2**

Date: **July 2024**

Project: **ETH21-264**



CONTENTS

	Page(s)
SUMMARY	3
1 INTRODUCTION	4
2 METHODOLOGY	7
3 BASELINE ECOLOGICAL CONDITIONS	21
APPENDIX 1 – BAT ACTIVITY SURVEY DATA	57
APPENDIX 2 – BAT STATIC DETECTOR DATA	62

SUMMARY

Purpose of the Report	This Report has been produced by Ethos Environmental Planning on behalf of Lightwood Strategic Ltd. It provides an assessment of the likely ecological effects associated with the residential led mixed use development in Wokingham.
Description of the scheme	The development proposals for the site include plans for a mixed-use development of 850 homes, community facilities including neighbourhood centre, (Use classes F and/or E) public open space, play areas, allotments and associated infrastructure and landscaping; and proposed Suitable Alternative Natural Greenspace (SANG).
Methodology	A desk study and UK Habitat Classification survey were undertaken for the site in 2021, respectively. Detailed surveys for bats, reptiles, amphibians, dormice and badger were undertaken throughout 2021 - 2023.
Baseline Ecological Conditions	The site comprised an area of modified grassland, other neutral grassland, cereal crops, developed land, sealed surface, artificial land, unsealed surface, woodland and a network of hedgerows with ditched and a non-priority river habitat. The surveys identified twelve species of bat including barbastelle, Bechstein's bat, serotine, Brandt's/whiskered bat, Daubenton's bat, Natterer's bat, Leisler's bat, noctule, common pipistrelle, soprano pipistrelle, brown long-eared bat and Nathusius's pipistrelle. The eDNA survey for the ponds was returned as negative for great crested newt (GCN) DNA. Low numbers of slow worm and grass snake were identified on site. [REDACTED] Hazel dormouse have been considered absent from the site. The woodland and boundary hedgerows were assessed as suitable habitat for invertebrates, mammals and birds.

1 INTRODUCTION

- 1.1 This technical appendix report has been prepared by Ethos Environmental Planning (Ethos) on behalf of Lightwood Strategic Ltd. The report was written by Ellie Shearn BSc (Hons), Ecologist, and reviewed by Matthew Attrill BSc (Hons), Senior Ecologist at Ethos. The final report has been approved by Jim Phillips, Managing Director at Ethos. The details and experience of the authors and field survey team are provided in Section 2.16.
- 1.2 The report provides the results of surveys undertaken in relation to the proposed development of a residential led mixed use development on 'Land to East of Easthampstead Road and West of Old Wokingham Road' (Central Grid Reference SU 83405 67330), hereafter referred to as 'the site' and shown in Figure 1. The site forms part of the South Wokingham Strategic Development Location (SDL) Extension, shown in Figure 2. The site is located in the south Wokingham, Berkshire.
- 1.3 The site comprises 56.79 hectares and includes fields of modified grassland, other neutral grassland, cereal crops, mixed scrub, artificial unvegetated, unsealed surface, developed land, sealed surface, woodland and a network of hedgerows, ditches and a non-priority river habitat.

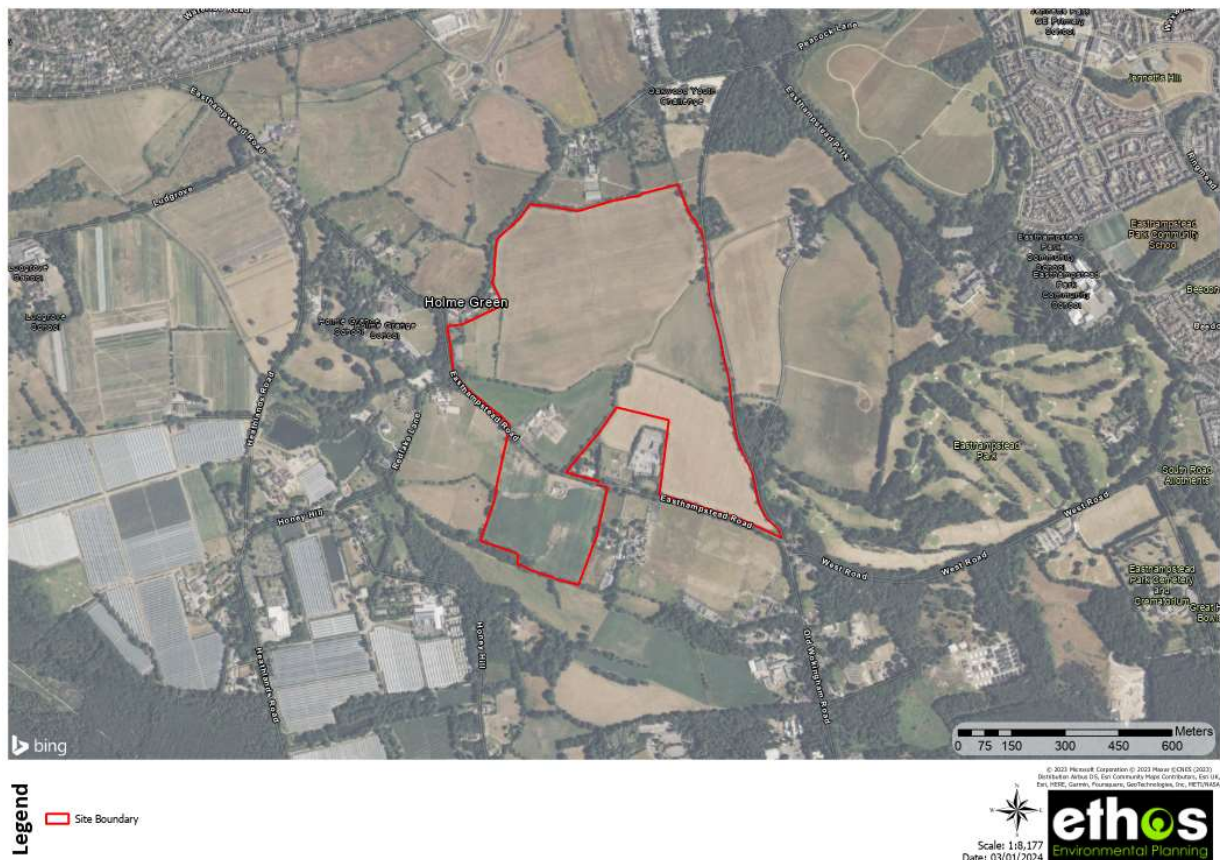


Figure 1 Site location

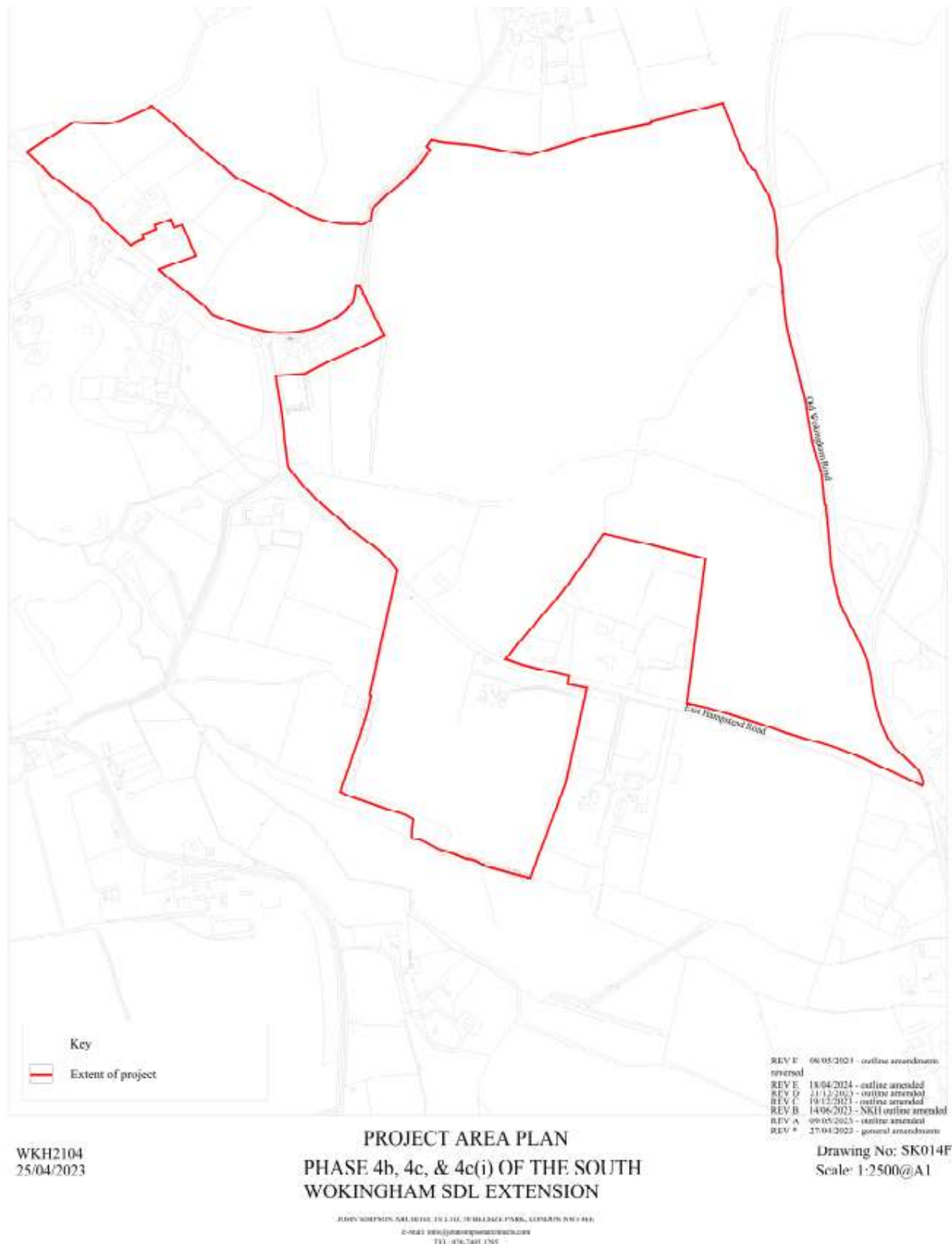


Figure 2 Project Area Plan, Phase 4b, 4c, & 4c(i) of the South Wokingham SDL Extension (John Simpson Architects Ltd, 2023^o, Drawing No: SK014F, Rev F)

- 1.4 The site is proposed for development of a mixed-use development of 850 homes, community facilities including neighbourhood centre, (Use classes F and/or E) public open space, play areas, allotments and associated infrastructure and landscaping; and proposed Suitable Alternative Natural Greenspace (SANG), as shown in the Project EIA Illustrative Masterplan (John Simpson Architects Ltd, 2023^b).
- 1.5 The aims of this report are to:
- provide an assessment of the likely effects of the proposed development on ecological features on site;
 - provide an assessment of the likely effects of the proposed development on adjacent or nearby designated sites;
 - identify the measures required to mitigate impacts on site biodiversity;
 - identify opportunities to deliver ecological enhancements and measurable gains for biodiversity as part of the development proposals; and
 - to enable the Local Planning Authority to assess whether the proposals comply with relevant planning policy or legislation.
- 1.6 This report has been produced following the approach set out in CIEEM's 'Guidelines for Ecological Report Writing' (CIEEM, 2017).

2 METHODOLOGY

2.1 Scope of Assessment

2.1.1 This assessment has been undertaken following the approach set out in the '*Guidelines for Ecological Impact Assessment in the UK and Ireland*' (CIEEM, 2018). The assessment has considered 'Important Ecological Features' that are present within the 'Zone of Influence' of the project. Important Ecological Features for this project comprise¹:

- Designated nature conservation sites;
- Habitats and Species of Principal Importance for the Conservation of Biodiversity in England;
- Legally protected species; and
- Red Listed or rare species (based on Red Data Book lists, Birds of Conservation Concern and species considered to be nationally rare/scarce).

2.1.2 The Zone of Influence (Zoi) is the area over which the project could have an influence on ecological features. The Zoi is likely to vary for different features. However, in general terms the Zoi for this development proposal is considered to comprise the land within the red line boundary as well as immediate adjacent habitat features. It also includes designated nature conservation sites in the surrounding area.

2.1.3 The scope of the assessment was informed by an 'ecological walkover' undertaken in November 2021 with subsequent follow up surveys undertaken between 2021 - 2023. The purpose of this was to identify the habitats on site, their potential for protected species and to establish the scope of surveys that would be required to inform a future planning application at the site.

2.1.4 The overall assessment has been informed by guidelines provided in CIEEM (2017) Guidelines for Ecological Report Writing.

2.2 Background Data Search

2.2.1 A background data search was received from Thames Valley Environmental Record Centre in November 2021. The search area included records of non-statutory designated sites and protected and notable species within 2km of the proposed development site.

2.2.2 An additional search for statutory designated sites within 2km of the development site and granted European Protected Species (EPS) licences within 2km of the site boundary was undertaken using publicly available information (DEFRA Magic map).

¹ Box 14 in CIEEM's EcIA Guidelines (2018)

2.3 UK Habitat Classification Survey

- 2.3.1 An initial UKHab survey was undertaken on 17th November 2021 and subsequent UKHab surveys were undertaken of the various land parcels within the proposed development site throughout April 2022 and were re-assessed again in July 2023 for an updated view. The survey incorporated detailed assessment of the land within the development boundary, including a description and mapping of all key features and habitat types. The survey was carried out to identify the range of habitats within the site and the predominant and notable species of flora. This survey was informed by the 'Handbook for Phase 1 Habitat Survey – a technique for environmental audit' (JNCC, 2010).
- 2.3.2 Grasslands were surveyed using professional judgement and random sampling. A minimum of three 1x1m² quadrats were undertaken for each grassland parcel. Information collected within each quadrat included aspect, slope, average ground cover, sward variation, species and their percentage cover. Where the grassland differed to a certain extent, or was divided by a field boundary, it was considered that the grassland was a different habitat parcel and another assessment was undertaken.

2.4 NERC S. 41 Mammals

- 2.4.1 The survey included an assessment of the habitats on site for their potential to support NERC Section 41 species such as hedgehog (*Erinaceus europaeus*), polecat (*Mustela putorius*), harvest mouse (*Micromys minutus*) and brown hare (*Lepus europaeus*). This included a search for nests, runs, latrines, paw prints, and live specimens.

2.5

2.5.1

2.5.2

2.6 Hazel Dormouse

- 2.6.1 The survey included an assessment of the potential of the site for hazel dormouse (*Muscardinus avellanarius*), focusing on the connectivity and suitability of the habitat on site.
- 2.6.2 100 dormouse tubes were deployed in suitable habitat across the site in April 2022 at roughly 20 metre intervals. The tubes were checked once a month between June and November 2022. Table 1 below (taken from Table 5 of the *Dormouse Conservation Handbook*) shows the index of probability of finding evidence of dormouse in nest tubes. The score is based on 50 tubes deployed and a minimum score of 20 must be reached to determine presence/likely absence. As the tubes were deployed between May and November, the total score achieved was 24 and the threshold was therefore met.

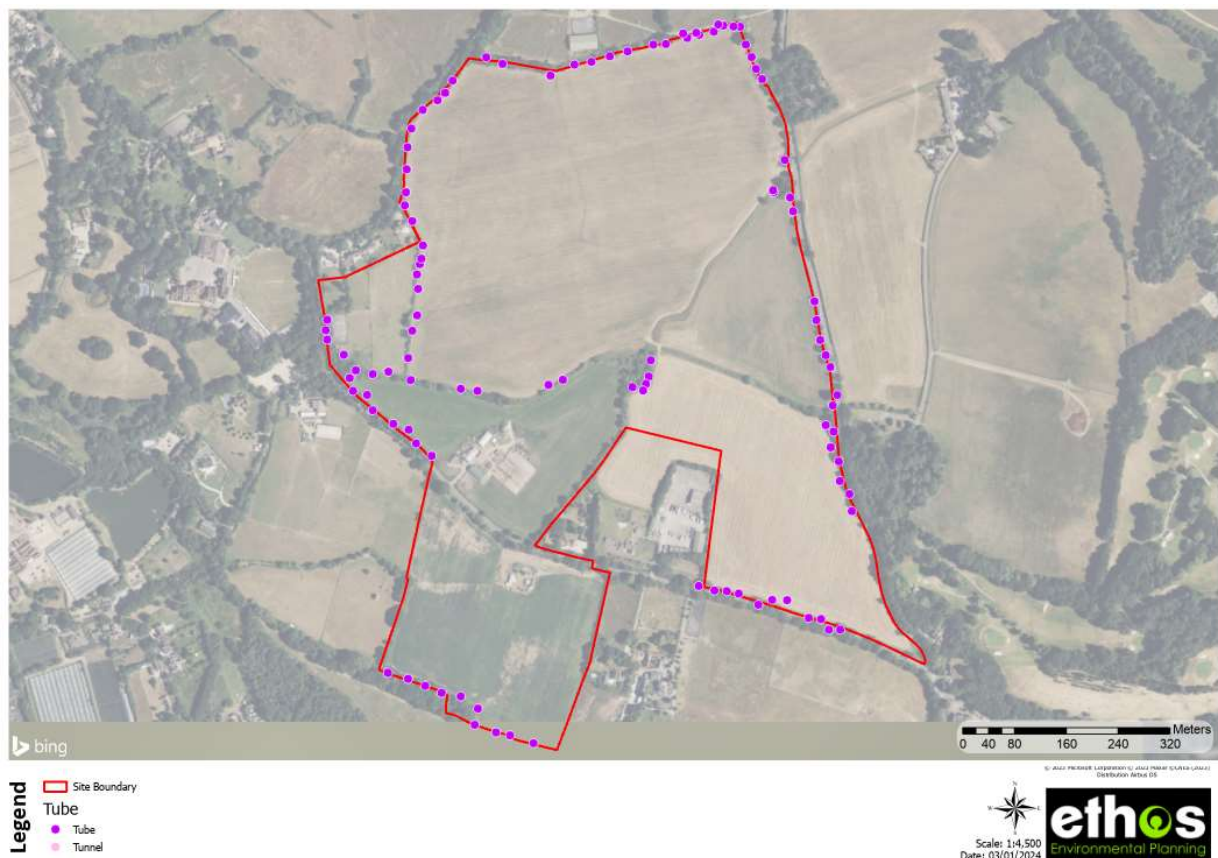


Figure 3 Location of dormouse tubes deployed across the site

Table 1 Index of probability of finding dormice present in nest tubes in any one month

Month	Score
April	1
May	4
June	2
July	2
August	5
September	7

October	2
November	2
Total	24

2.7 Otter

2.7.1 A detailed otter survey was undertaken across the study area on 14th April 2022, 19th July 2022 and 5th October 2022. The surveys involved searching along the banks of the stream up and downstream for evidence of otter across the site.

2.7.2 The methodology was informed by 'Monitoring the Otter *Lutra lutra*' (Chanin, 2003).

2.7.3 The following signs and evidence of otters was assessed:

- Holts - underground shelters, often found under tree roots, in rock piles, earth banks, and can be located within existing structures such as [REDACTED] rabbit burrows, fox earths and above ground shelters in dense scrubby vegetation.
- Couches - lying up places above ground. Often found in long grasses, dense vegetation or rushes near watercourses or in wetland areas.
- Feeding sites - where food remains are found, mainly fish, shellfish or amphibians.
- Spraints - faeces left by the otter, showing food remains. Typically, in prominent positions on rocks, trees or tree roots, beneath bridges, at crossing points of fences or walls, or confluence of river systems.
- Tracks - otter tracks (typically footprints) are highly distinctive and diagnostic and clearly differentiated from mink tracks by both size and shape.

2.8 Water Vole

2.8.1 The survey methodology was informed by 'The Water Vole Mitigation Handbook' (Dean *et al.* 2016). Surveys were undertaken on 14th April 2022, 19th July 2022 and 5th October 2022. The surveys covered the two halves of the breeding season and were undertaken at least two months apart, in line with guidance.

2.8.2 All waterbodies within the site were searched by experienced surveyors. The survey entailed a search for the following evidence:

- Sightings;
- Footprints;
- Run-ways in vegetation;
- Burrows;
- Lawns;
- Nests;
- Feeding stations; and,
- Faeces and latrines.

2.9 Bats

- 2.9.1 The methodology for the bat survey has been informed by the 'Bat Surveys for Professional Ecologists Good Practice Guidelines 3rd Edition' (Collins, 2016).
- 2.9.2 The habitats on site were assessed for their suitability to support foraging and commuting bats. This assessment was also contextualized through examination of suitable habitat and features in the wider landscape and possible flight-lines across the proposed site following natural linear features such as hedgerows.
- 2.9.3 An assessment of the trees to support roosting bats was undertaken. Potential roosting features on trees were identified as any feature within a tree that could provide shelter for a roosting bat. These features result from the following three mechanisms: disease and decay, damage, and associations.

Preliminary roost inspection

- 2.9.4 Physical external and internal inspection of the buildings were undertaken on 14th April 2022, 1st June 2022 using the equipment described below to assist the inspection. Approximately 10 hours of search effort were expended.
- 2.9.5 The physical search includes a search for live animals and a search for other signs that give an indication of past or present occupancy as outlined below. In the case of bats, typical indicators include droppings (which are characteristic and can often be speciated or at least be indicative of species type), signs of staining, urine splashing, characteristic odours, and accumulations of discarded prey remains.
- 2.9.6 Where required, the search included an endoscope search of features with potential for bats. Equipment included a Rigid micro-CA-350 Inspection Camera with micro 6mm extension, camera, laser measure, and binoculars.

Activity surveys

- 2.9.7 Bat activity surveys were undertaken on site to highlight any important commuting or foraging features on site. This included six surveyors walking the planned transects of the site. The number of transects and number of surveys was informed by the habitats assessment which stated that the site provided moderate potential for bats.
- 2.9.8 Information recorded throughout the survey included the species present, their location, behaviour, and the identification of habitat features which were frequently used by the species. Surveyors were equipped with EMT bat detectors.
- 2.9.9 The transect is displayed within Figure 4 below and the dates of the surveys are provided below.

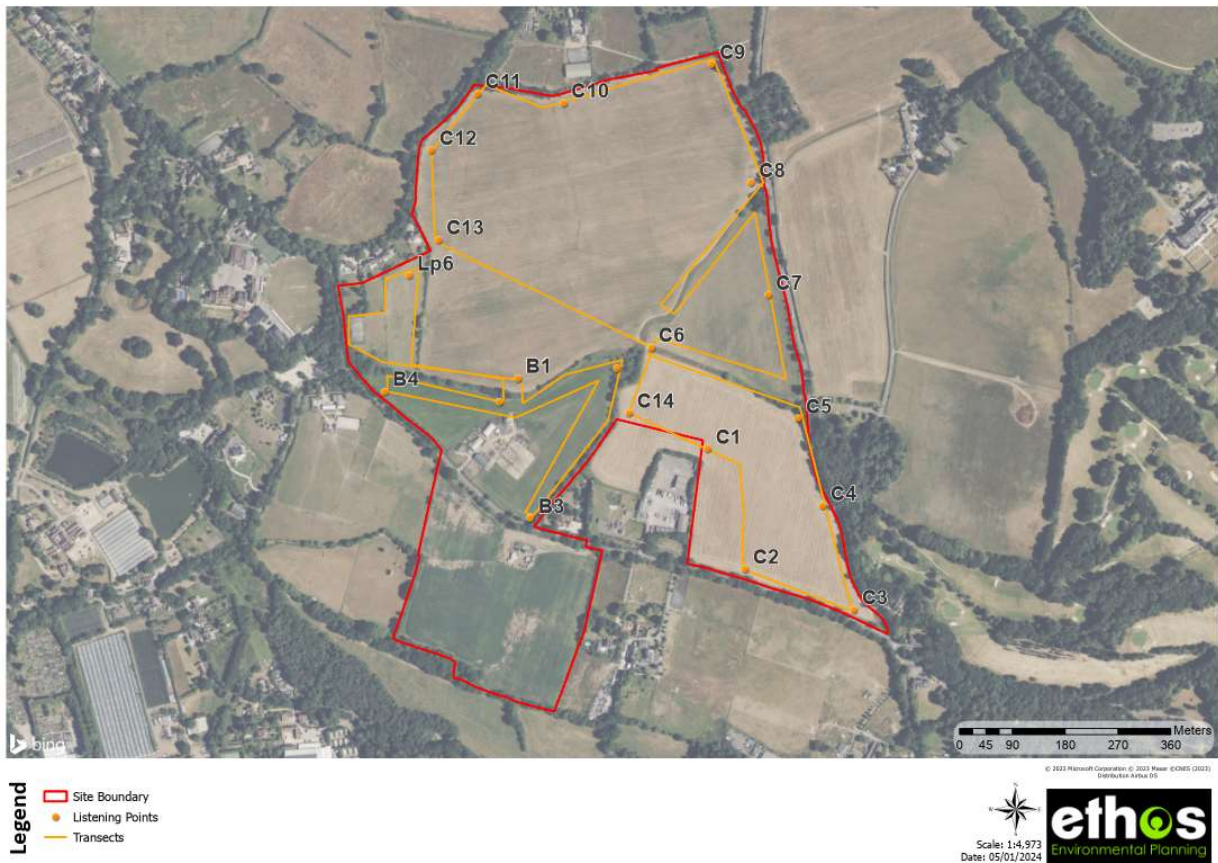


Figure 4 Activity survey transects and listening points

Automated / static surveys

- 2.9.10 Bat static surveys were used to provide the composition of bat species present on site and were used to support the findings of the bat activity surveys. Bat surveys were undertaken between April – October 2022 with six statics deployed over a five-day period each month. The number and timings of the surveys were informed by the scoping assessment.



Figure 5 Static bat detector locations

2.9.11 The calls were processed and analysed using the British Trust for Ornithology (BTO) Pipeline. This software provides a confidence score for each species returned and highlights rare species which are unlikely to be detected in the survey area. Results with a low confidence <50% probability were excluded from the analysis.

2.10 Birds

2.10.1 The bird survey included an assessment of the habitats on site for their potential to support protected and notable species of bird as well as their potential to support breeding birds.

2.11 Reptiles

2.11.1 The potential presence of reptiles on site was assessed considering the habitats present (availability of refugia and basking areas) and suitability of surrounding environment. The assessment of habitats was informed by the *Herpetofauna Workers Manual* (Gent and Gibson, 2003). Where possible, attempts to confirm reptile presence on site were made following *Froglife Advice Sheet 10 – Surveying for Reptiles* through direct observation in reptile “hotspots” and checking of any existing refugia.

2.11.2 Seven presence / absence surveys were targeted to areas most likely to contain reptile habitats and to those areas that may be disturbed as part of the scheme. Searches were

undertaken when the air temperature was between 9°C and 18 °C with intermittent or hazy sunshine, little or no wind, and no rainfall. The location of the reptile mats are displayed within Figure 6.

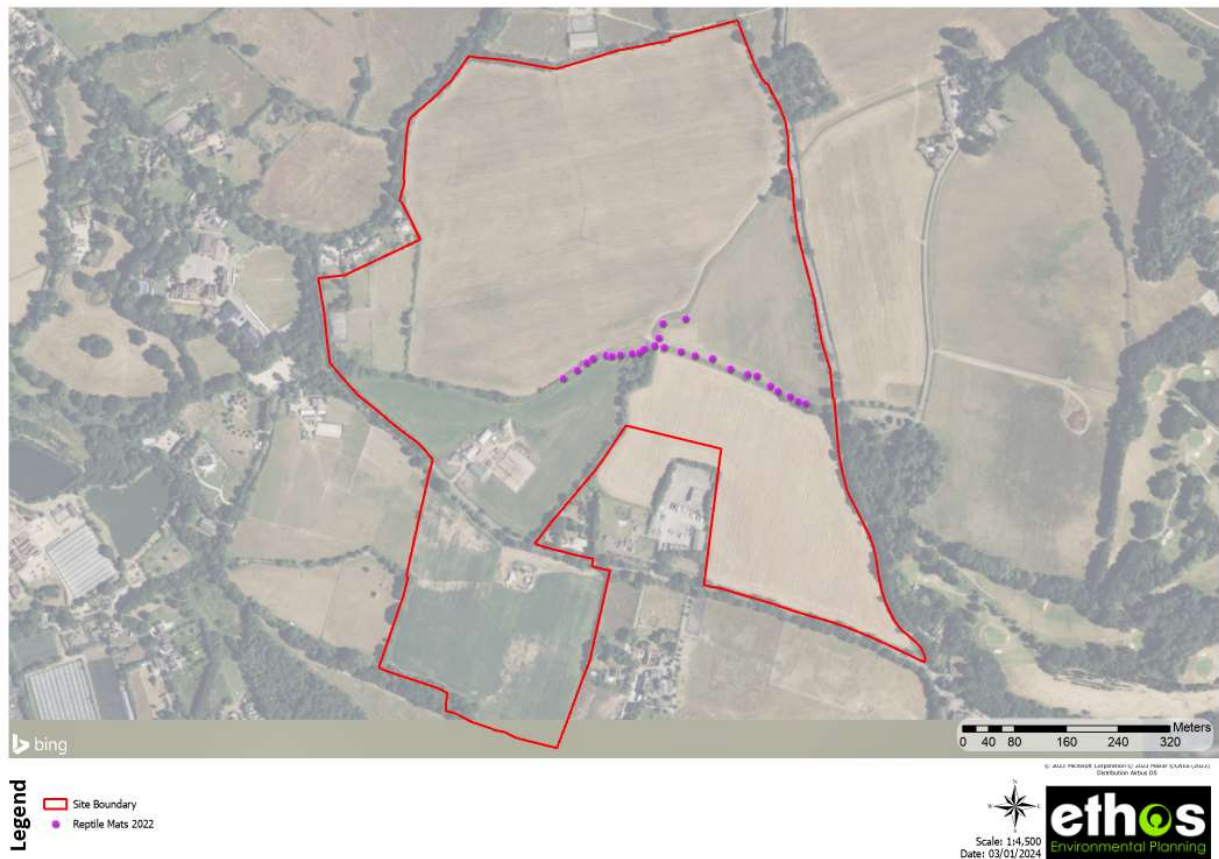


Figure 6 Location of reptile mats



Figure 7 Close up location of reptile mats

2.12 Amphibians

- 2.12.1 Surveys for GCN were informed by the *Great Crested Newt Conservation Handbook*, Froglife 2001.
- 2.12.2 The site was examined for suitable waterbodies and for breeding terrestrial habitat. Terrestrial habitats providing sufficiently structured vegetation in which amphibians may forage or hibernate over winter were also surveyed for.
- 2.12.3 In addition to the on-site assessment, *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) recommend that a desktop analysis of ponds within 500m of the site be undertaken, to identify any potential breeding ponds which may require further survey. Ponds within 500m of the site were mapped on GIS with an OS OpenData base map at 1:10,000 resolution.

HSI scoring

- 2.12.4 Habitat suitability indices (HSI) were calculated for every pond within the 500m buffer. The HSI was developed by Oldham *et al.* (2000) as a means of evaluating habitat quality and quantity. Ten suitability indices are assessed visually for each pond resulting in a numerical index between 0 (unsuitable) and 1 (highly suitable). As stated in ARG UK Advice Note 5 (Amphibian and Reptile Groups of the United Kingdom, 2010), "In general, ponds with high HSI scores are more likely to support great crested newts than

those with low scores. However, the system is not sufficiently precise to conclude that any pond with a high score will support newts, or that any pond with a low score will not do so.”

- 2.12.5 Targeted GCN survey were carried out in accordance with the guidelines set out in the Herpetofauna Worker’s Manual (Gent & Gibson, 2003) and Great Crested Newt Mitigation Guidelines (English Nature, 2001).

eDNA surveys

- 2.12.6 Ponds 1 and 2 were subject to eDNA surveys on 28th April 2022. The surveys comprised the collection of 40ml samples from 20 locations around the edge of the pond. Samples are mixed together in a bag and six 15ml samples are extracted and stored within preserving fluid. These samples were then sent to ADAS, who analyse the samples for GCN DNA. This technique has been tested by DEFRA and found to have a reliability of 99.3%. Sampling methodology followed best practice guidance within Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt (Freshwater Habitats Trust, 2014).

2.13 Invertebrates

- 2.13.1 Due to the many invertebrate taxonomic groups that exist, the often-large differences in invertebrate diversity between habitats and the many survey techniques available, invertebrate surveys are highly specific to individual sites. Therefore, an assessment of the site’s potential for invertebrates was undertaken, including the need for targeted surveys, as recommended in *Considering Invertebrates in Preliminary Ecological Appraisals* (Jukes, 2021).

2.14 Limitations

- 2.14.1 The static bat detectors deployed during some of the static deployments did not record a full 5 nights of data due to a technical failure. It was assessed that this was not a significant limitation due to the extensive monitoring throughout the remaining active season.
- 2.14.2 Several of the offsite ponds, identified in the desktop search were on private land and not accessible for surveying. The majority of the ponds were separated from the site by significant barriers to dispersal and it was considered that this did not constitute a significant limitation to the assessment.

2.15 Evaluation of Ecological Features

- 2.15.1 In line with CIEEMs guidelines on EcIA, this assessment has focused on relevant Important Ecological Features. The scale of importance of these features has been determined based on available contextual information, which for this project are considered only to include:

- **International** – of international importance and protected through international legislation;
- **National** – of importance in England and protected through national legislation;
- **County** – of importance to the county (Berkshire) but not sufficiently important to warrant 'National' scale of importance; and
- **Local** – of importance to the local area (Wokingham), but not sufficiently important to warrant County scale of importance.

2.15.2 Potential impacts on Important Ecological Features are identified and assessed; likely significant effects are those likely to result in a change to the conservation status of a habitat or species population or undermine/support nature conservation policy. Mitigation measures have been devised following the mitigation hierarchy; appropriate mechanisms for securing mitigation measures have been identified.

2.16 Personnel

2.16.1 The surveyors on site have been detailed below in Table 2.

Table 2 Site surveyors

Ecologist	Position	Qualifications/ Licences	Experience	Role in assessment
Jim Philips	Managing Director	MSc BSc (Hons), MCIEEM Class 2 Bat Licence Class 1 GCN Licence	Jim's experience in ecology covers a wide range of projects and clients and his focus is on interpreting relevant policy and legislation to ensure projects are delivered efficiently and meet the needs of the client. He holds survey licenses for bats and great crested newts in England and Wales and is a registered consultant on Natural England's Bat Low Impact Class License (BLICL)	Report checker
Sarah Forsyth	Principal Ecologist	MSc DIC BSc (Hons), ACIEEM Class 1 GCN Licence Tree Climbing and Rescue, City and Guilds NPTC Level 2 Award (206 and 306)	Sarah has over 15 years' experience in ecological management and assessment, both in consultancy and the public sector. Sarah is responsible for leading on ecological assessments and overseeing projects through various stages of planning and implementation.	Bat surveyor
Steph Green	Principal Ecologist	MSc BSc (Hons), MCIEEM Class 1 GCN Licence	Steph has over eight years' experience in ecological field survey and consultancy. Steph is responsible for leading and undertaking comprehensive	Bat, reptile and dormouse surveyor

Ecologist	Position	Qualifications/ Licences	Experience	Role in assessment
		Class 1 Hazel Dormouse Licence	habitat assessments, protected species surveys and is a licenced GCN and dormouse worker, as well as a Full Member of CIEEM.	
Dan Carpenter	Principal Consultant (Biodiversity Net Gain)	BSc(Hons), PhD, CEnv, MIEEnvSc, official position:	Dan is an ecologist and environmental data scientist with over twelve years of experience in ecological research and practice. His focus is on securing biodiversity and environmental net gains for Ethos' clients, both for individual projects and strategically. Dan has a broad range of ecological experience and its application in development, land management and nature conservation.	Bat and otter and water vole surveyor
Martin Smith	Senior BNG Consultant	BSc (Hons) Class 2 Bat Licence (NE) Class 1 dormouse licence (NE) Class 1 GCN Licence	Martin is a qualified tree climber and holds licences for dormouse, bats, and GCN. Martin specialises in undertaking BNG assessments and works on offsetting projects for Ethos. Martin manages multiple projects with Ethos and is competent at a range of phase 1 and phase 2 ecological surveys.	Reptile, bat, otter and water vole, River Condition assessment and UKHab surveyor
Matt Attrill	Senior Ecologist	Tree Climbing and Rescue, City and Guilds NPTC Level 2 Award (206 and 306) BSc (Hons) Class 2 Bat Licence Class 1 GCN Licence	Matt is a highly experienced field surveyor with over 7 years ecological experience. Matt is competent in surveying for a wide variety of wildlife gained experience from both the commercial and voluntary sectors.	UKHab, bat, badger, dormouse, reptile, otter and water vole, GCN surveyor
Kane Burchill	Senior Ecologist	Level 2 Certificate and Diploma in Work-based Environmental Conservation Tree Climbing and Rescue, City and Guilds NPTC Level 2 Award (206 and 306) ACIEEM	Kane has over eight years' experience in ecological field survey and consultancy. As an Senior Ecologist with Ethos; Kane is responsible for leading and undertaking comprehensive habitat assessments protected species surveys and is a licenced bat, GCN and dormouse worker.	Bat, dormouse, tree and reptile surveyor

Ecologist	Position	Qualifications/ Licences	Experience	Role in assessment
		Class 1 Bat Licence (NE) Class 1 Hazel Dormouse Licence (NE) Class 1 GCN Licence (NE)		
George Clutterbuck	Environmental Analyst	Level 2 Certificate and Diploma in Work-based Environmental Conservation Working towards a certificate of higher learning: Field Ecology - currently Level 2 Certificate and Diploma in Work-based Environmental Conservation	George has over seven years' experience in ecological field survey and consultancy. George is responsible for undertaking comprehensive habitats and protected species assessments. Much of his time is spent digitising using GIS software to achieve Biodiversity Net Gain.	UKHab, bat and drone surveyor
Joel Sellors-Moore	Ecologist	MSc, Qualifying CIEEM	Has over four years' experience in ecological field survey and consultancy. Joel is responsible for managing projects and undertaking comprehensive habitat and protected species assessments in addition to biodiversity net gain and nutrient neutrality assessments. At the time of writing this report, Joel no longer works for Ethos.	Bat, dormouse, UKHab, GCN, reptile and tree surveyor
Becky Morris	Ecologist	PhD, DIC, MSc, BSc, MCIEEM Class 1 GCN Licence	Becky has 16 years' experience working as an Ecological Consultant, specialising in botanical surveys. She holds a great crested newt survey licence.	Reptile, otter and water vole and bat surveyor
Joe Bamforth	Ecologist	MSc, BSc (Hons) Class 1 Bat Licence 2022-10148-CL17-BAT Tree Climbing and Rescue, City and Guilds NPTC Level 2 Award (206 and 306)	Joe has over three years' experience in ecological consultancy and assists with habitat assessments, protected species surveys and data analysis.	Bat, dormouse, UKHab, reptile and otter and water vole surveyor
Sarah Roberts	Assistant Ecologist	MSc, BA	Sarah has over three years' of consultancy and biodiversity project management experience. Sarah assists with fieldwork and report-writing	Bat, dormouse, River Condition assessment and UKHab surveyor

Ecologist	Position	Qualifications/ Licences	Experience	Role in assessment
		Class licence WML-CL29 To survey for barn owl (<i>Tyto alba</i>)	for habitats and protected species. She specialises in ornithology and ecological provisions for urban developments.	
Ellie Shearn	Ecologist	BSc (Hons), Qualifying CIEEM	Ellie is an ecologist at Ethos with three years' experience in ecological field survey. Ellie undertakes protected species surveys including bat surveys and assessment.	Bat, reptile, dormouse and otter and water vole surveyor. Report author
Ben Smurthwaite	Ecologist	MSc, BSc (Hons) Qualifying CIEEM Class 1 GCN Licence (NE) Class 1 Bat Licence (NE)	Ben has over three years' experience in ecological field surveys and consultancy, and is responsible for managing projects, undertaking habitat and protected species surveys and biodiversity net gain assessments, and is a licenced bat and great crested newt worker.	Bat, otter and water vole and dormouse surveyor
Kate Downes	Assistant Ecologist	MSc, BSc (Hons), DET, QTLS Qualifying CIEEM	Kate is an assistant ecologist at Ethos with a special interest and relevant field survey experience in ornithology. Kate assists with fieldwork and report-writing for habitats and protected species.	Reptile, dormouse, bats, otter and water vole surveyor
Katie Munday	Ecologist	MSc, BSc (Hons), Qualifying CIEEM	Katie has two years' experience in ecological consultancy. She undertakes a variety of surveys, including protected species surveys and habitat assessments, and she assists with bat call data analysis.	Bat and reptile surveyor
Holly Atkinson	GIS Officer	MSc, BSc (Hons)	Holly has worked for two ecological consultancies in the South West and currently supports the Ethos team by producing GIS maps for a wide range of projects. Her GIS skills have been enhanced through use of the software both during her Masters and while carrying out ecological research abroad. She also has experience in the field performing ecological surveys, primarily of bats.	Bat surveyor

3 BASELINE ECOLOGICAL CONDITIONS

3.1 Designated Sites

Statutory Designated Sites

- 3.1.1 The background data search identified one Local Nature Reserve (LNR), three Sites of Special Scientific Interest (SSSI) and one Special Protection Area (SPA) within 2km of the proposed development. All of the below sites are located over 1km from the site.
- 3.1.2 Heath Lake is a LNR and a SSSI that consists of a small, shallow lake, surrounded by birch and pine woodland with areas of relict heathland. Heath Lake is a long-established open water habitat supporting specialist communities of native plants and animals. Of particular interest are populations of some uncommon and rare aquatic plant species.
- 3.1.3 Broadmoor to Bagshot Woods and Heaths is a SSSI that has an extensive mosaic of broadleaved woodland, coniferous plantation, dry and wet heathland, valley mire, a series of base-poor ponds and a scarce breeding invertebrate assemblage. In particular, the heathland and coniferous plantation supports internationally important populations of woodlark, nightjar and Dartford warbler, and have a nationally important dragonfly and damselfly population. The site includes the valley bogs of Broadmoor Bottom and Wishmoor Bottom which form the most important remaining examples of this type of habitat in the area.
- 3.1.4 Wykery Copse is a SSSI that is a fragment of ancient broadleaved woodland of a kind now drastically reduced in Berkshire, situated on London Clay on the fringe of Bracknell. It is exceptionally diverse for its size, in terms of both woodland stand-types and herbaceous flora, and it contains several rarities. Its interest is enhanced still further by the small stream which flows through it.
- 3.1.5 The Thames Basin Heath is a SPA that is a composite site that is located across the counties of Surrey, Hampshire and Berkshire in southern England. It encompasses all or parts of Ash to Brookwood Heaths Site of Special Scientific Interest (SSSI), Bourley and Long Valley SSSI, Bramshill SSSI, Broadmoor to Bagshot Woods and Heaths SSSI, Castle Bottom to Yateley and Hawley Commons SSSI, Chobham Common SSSI, Colony Bog and Bagshot Heaths SSSI, Eelmoor Marsh SSSI, Hazeley Heath SSSI, Horsell Common SSSI, Ockham and Wisley Commons SSSI, Sandhurst to Owlsmoor Bogs and Heaths SSSI and Whitmoor Common SSSI. The open heathland habitats overlie sand and gravel sediments which give rise to sandy or peaty acidic soils, supporting dry heathy vegetation on well-drained slopes, wet heath on low-lying shallow slopes and bogs in valleys.

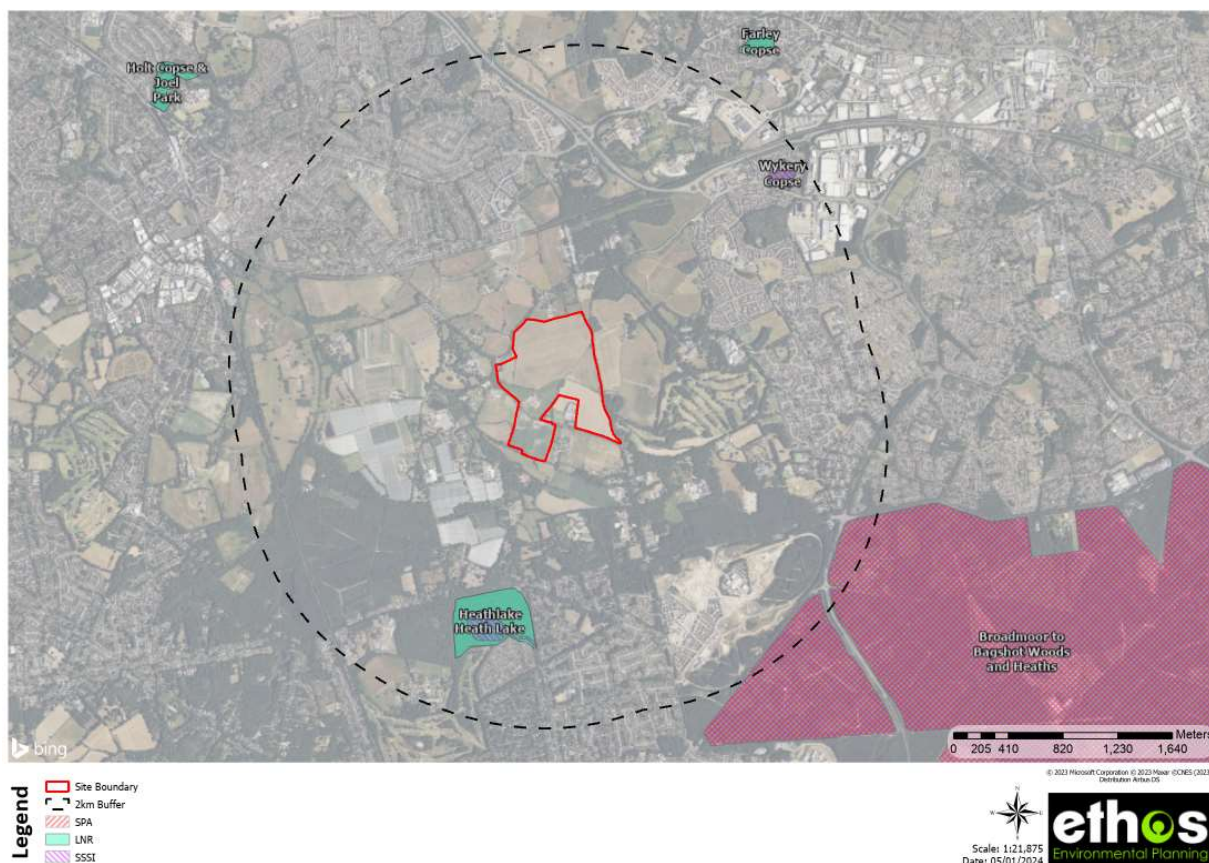


Figure 8 Statutory designated sites within 2km of the site

Non-statutory Designated Sites

3.1.6 The data search returned records of eight Berkshire Local Wildlife Sites within the 2km search radius, as detailed in Table 3 below; the data search also returned two Berkshire Proposed Local Wildlife Sites and one Biodiversity Opportunity Area.

Table 3 Non-statutory designated sites

Site Name	Designation	Description	Distance from the Site
Adjacent Wokingham Road/Peacock Lane	Local Wildlife Site	A small area split into two by a footpath. It is partly acidic birch woodland with some wet areas and partly oak woodland with much sycamore and some old lime coppice. Species recorded here include wood anemone, bluebell, bugle, primrose, yellow archangel and Solomon's-seal.	0m E
Rigg's Copse	Local Wildlife Site	A small ancient woodland with stands of oak and birch with hazel coppice, alder with birch and beech with holly. There are two good stands of wild service tree. There is a good varied ground flora including less common species such as common cow-wheat, polyplody and great wood-rush. Other species present include bluebell,	1.3km NE

		common spotted orchid, pignut, wood anemone, betony and wood sorrel.	
Tarman's Copse	Local Wildlife Site	Tarman's Copse, on the west edge of Bracknell, is bounded to the north and west by residential estates and industry to the east. To the south is an area of rough grassland, new properties and building site (as at May 2013). It is a mature, outgrown sweet chestnut coppice with ash and scattered oaks and localised alders. The ground flora includes locally abundant broad buckler fern and abundant bluebell. There are indications of its ancient woodland status, notably old ash coppice stools and wood banks, both external and internal with old pollard marker trees. The woodland has a varied 3D-structure and includes deadwood habitats and there is also, at least locally frequent, regeneration of the canopy trees. The habitat has affinities to the calcareous (W8) end of the W10 community. It has high public use. SECTION 41 HABITAT(S) OF PRINCIPLE IMPORTANCE: Lowland Mixed Deciduous Woodland	1.35km NE
Big Wood	Local Wildlife Site	Big Wood consists of two areas of woodland and an open area along the line of power lines. The site is largely ancient woodland except for the south-western section. The western area is classed in the inventory as replanted and is continuous with similarly classified woodland to the west. The southern woodland is dominated by birch with oak with bracken dominating below. Bluebells and wood sorrel are frequent. In the east oak is dominant and there is a well-developed understorey of hazel coppice with hawthorn, crab apple and field maple. Here bluebells dominate the ground flora. Ash is present at the edge. On the northern edge there is an area with abundant alder. The south western area is a pine plantation with some birch. Here holly is present. The northern woodland and also a small strip between the power lines is birch dominated with some oak and occasional hazel. Bracken dominates the ground flora although there are patches with abundant dog's mercury. Barren strawberry is present here. At the edge of the small strip a wild service tree is present. The open area is mainly dominated by bracken. In the east there is an area of wet	550m NE

		grassland with tufted hair-grass, Yorkshire fog and creeping bent and rush pasture with abundant soft rush. Species present indicate the acidic and wet nature of this area. These include locally frequent yellow loosestrife, foxglove, wood sage, marsh thistle, water mint, greater bird's-foot trefoil, tormentil, common century, the rare marsh stitchwort, betony and ragged robin. SECTION 41 HABITAT(S) OF PRINCIPAL IMPORTANCE: Lowland mixed deciduous woodland	
Gorrick Plantation	Local Wildlife Site	This site is largely conifer plantation with some wet alder woodland. The site has remnants of heathland and bog habitat. Grass snake, woodlark, woodcock and nightjar have been recorded here. Plants recorded here include purple moor-grass, cross-leaved heath, bell heather and round leaved sundew.	950m SW
Trench's Bridge	Local Wildlife Site	An area of woodland and coppice with a stream running from north to south. Oak is the dominant tree in the canopy and there is much birch. In the wetter areas, in the west, alder is abundant. Species present include bluebell, remote sedge, dog's mercury and lady fern. In the wetter areas common marsh bedstraw and bugle can be seen.	1.5km SW
Woodland near Ludgrove School	Local Wildlife Site	An area of dense woodland that slopes down to a stream with ditches running north-south through the wood. The wood is hazel coppice with alder, birch, rowan and hawthorn. There are some wet areas and some willow carr. The ground flora has dense nettles and currant (probably redcurrant). The richest areas of ground flora are found along the paths. Species present include moschatel and yellow archangel.	1.2km W
Peacock Meadows	Local Wildlife Site	Peacock Meadows is a large area of public open space predominantly composed of recreated wildflower grassland. The grassland creation has been successful, and the site is quite species-rich in places, however as of the 2019 survey the habitat is not currently considered to quite meet the definition of Lowland Meadow priority habitat. The site also incorporates West Garden Copse (formerly an ancient woodland LWS in its own right) along with areas of newly planted native woodland, scrub and scattered trees.	500m NE

Woodland South of Allotment Gardens	Proposed Local Wildlife Site	A small patch of ancient woodland on the outskirts of Bracknell, supporting lowland mixed deciduous woodland and a variety of wildlife. Section 41 Habitats of Principal Importance: Lowland Mixed Deciduous Woodland Recorded Occurrences of Protected / Notable Species Stag Beetle, Common Pipistrelle, Soprano Pipistrelle, Brown Long-eared, Serotine, and Natterer's Bats, Grass Snake and Slow Worm.	1km SE
Beaufort Park	Proposed Local Wildlife Site	This site has been proposed as a Local Wildlife Site. It was considered by the selection panel in spring 2010 but while some areas appeared likely to qualify for such status, especially the heathland, the information on the grassland was not sufficient to decide on where it was worthy of being notified at that time. It was hoped that further information would be obtained in for future consideration by the Local Wildlife Sites Panel. The site consists of an area of heathland, in the south-west, acid grassland and woodland.	600m SE
Thames Basin Heath	SAC, BOA	There are extensive areas of heathland and bog at Sandhurst to Owlsmoor Bogs and Heaths SSSI, Wellington Bog SSSI and within the largely wooded Broadmoor to Bagshot Heaths and Woods. Remnants are found elsewhere including the golf course at Crowthorne. Bog is also found in association with ponds and small lakes at Englemere Pond and Rapley Lakes. In the west remnants of these habitats are found. The heathland is important for species such as nightjar, woodlark and Dartford warbler and also reptiles and butterflies such as silver studded blue and grayling.	770 m S

Ancient Woodland

- 3.1.7 Parcels of ancient woodland are found within the 1km search radius of the site, namely Easthampstead Park, Watley's Copse and Big Wood, as shown on Figure 9 below. Easthampstead Park is located immediately adjacent to the eastern boundary of the site.

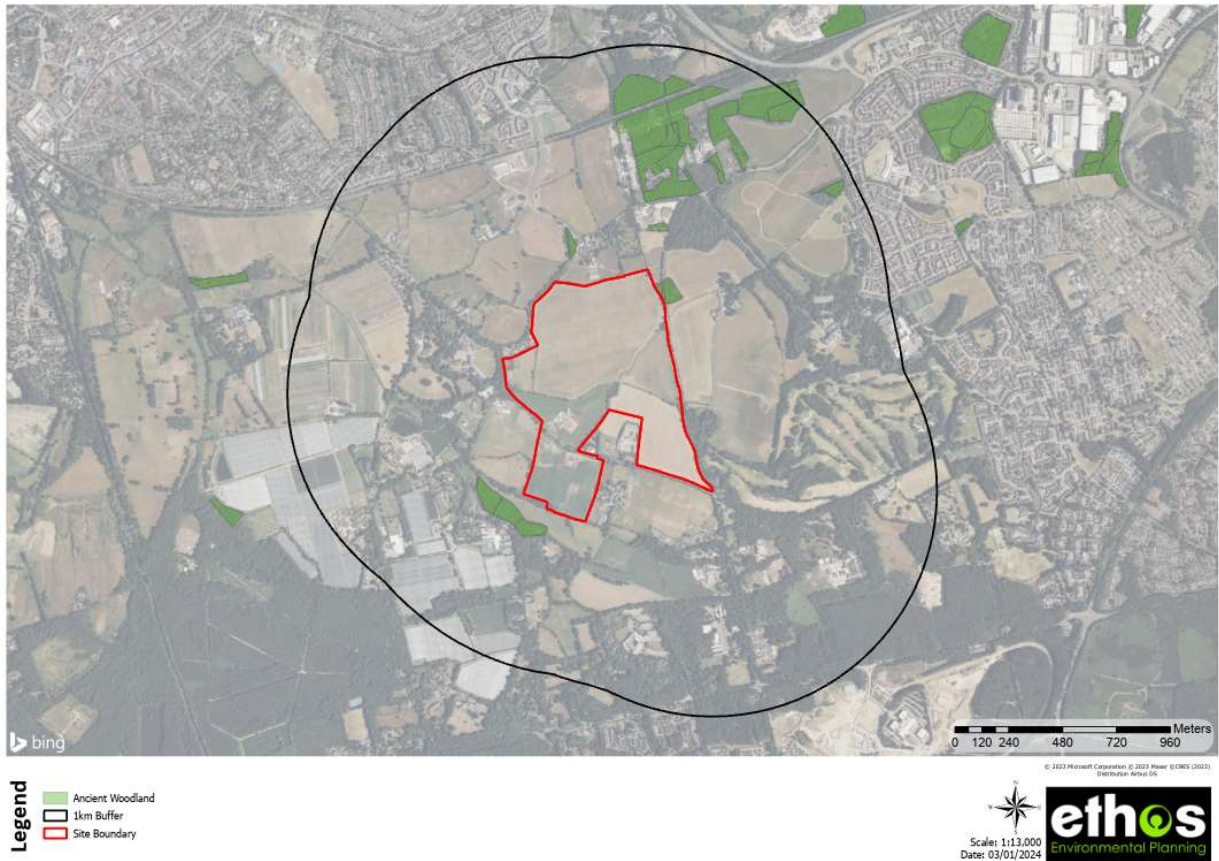


Figure 9 Ancient woodland parcels within 1km of the site

Priority Habitats

- 3.1.8 Many parcels of deciduous woodland are located immediately adjacent to and close to the site, as shown in Figure 10.

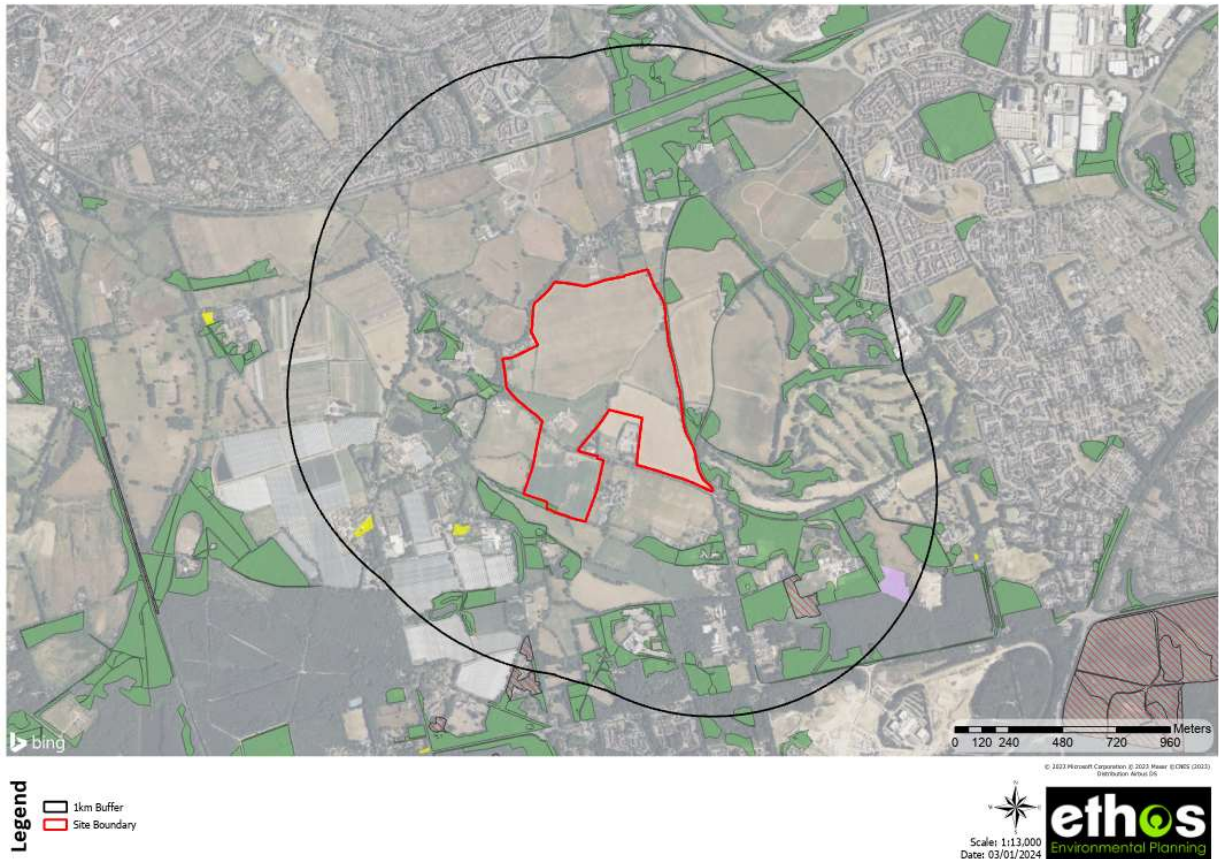


Figure 10 Priority habitats within 1km of the site (green is deciduous woodland and yellow is traditional orchard)

3.2 Habitats

General Site Description

- 3.2.1 The site is comprised of a network of grassland and arable fields with areas of mixed scrub and sealed and unsealed urban habitats. Within the site are several parcels of land under different ownership. Within the subsequent sections, the areas of land are referred to by the name of the land owner; Jeater and O'Brien are located in the west of the site, Wilson in the south, and Priors and Hambridge make up the large central section of the site.

UKHab Survey

- 3.2.2 Figure 11 displays the key habitats using the UK Habitat classifications. Descriptions of the habitats are provided in the following section. The UKHab was first undertaken in 2022 and then updated in July 2023.

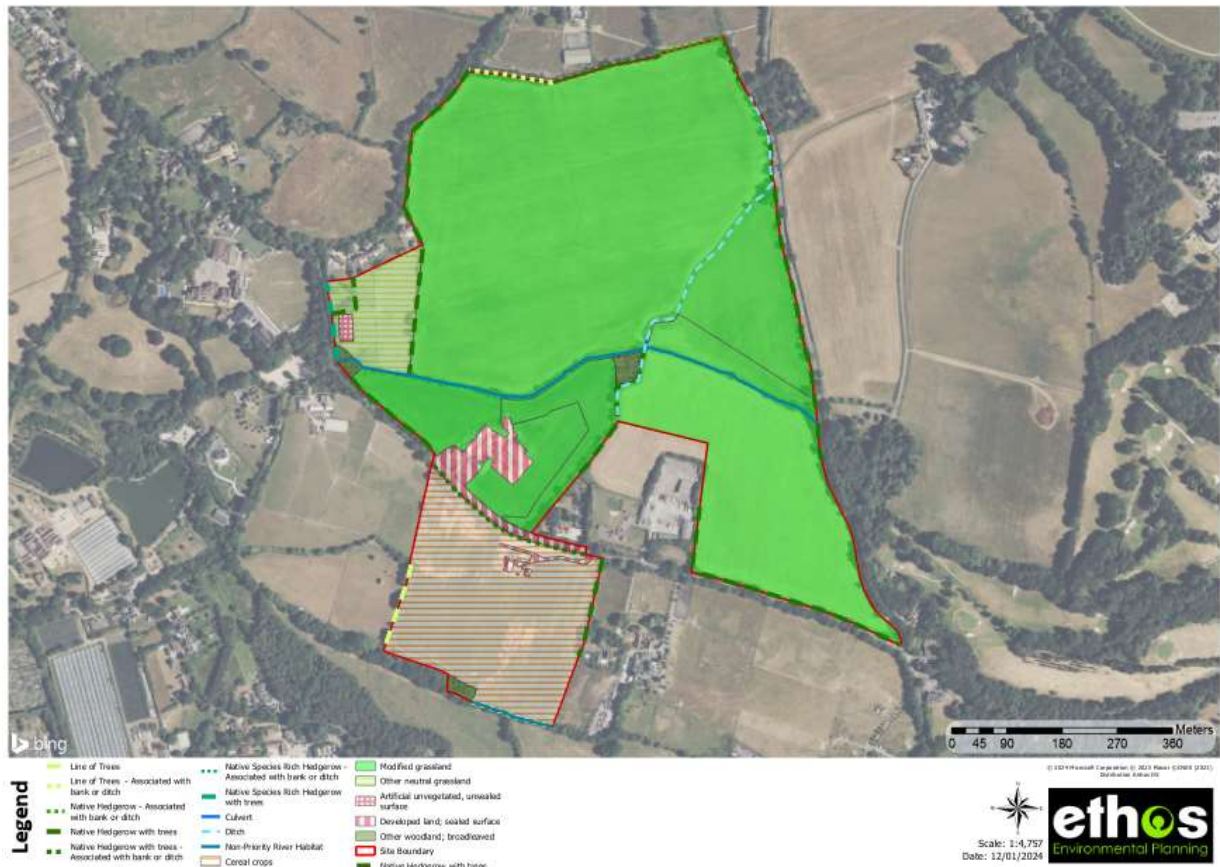


Figure 11 UKHab

Other neutral grassland

- 3.2.3 There is a parcel of other neutral grassland in the west of the site that is horse-grazed with minor poaching.
- 3.2.4 The species recorded within the Jeater parcel areas are: creeping bent (*Agrostis stolonifera*), Yorkshire fog (*Holcus lanatus*), field buttercup (*Ranunculus acris*), bush vetch (*Vicia sepium*), dandelion (*Taraxacum spp*), primrose (*Primula vulgaris*), cuckoo flower (*Cardamine pratensis*), white clover (*Trifolium repens*), creeping thistle (*Cirsium arvense*), kidney vetch (*Anthyllis vulneraria*), common daisy (*Bellis perennis*) and common nettle (*Urtica dioica*).
- 3.2.5 The species recorded within the O'Brien parcel include: ragwort (*Jacobaea vulgaris*), chickweed (*Stellaria media*), water purslane (*Ludwigia palustris*), ribwort plantain (*Plantago lanceolata*), white clover, creeping buttercup (*Ranunculus repens*), dandelion, common daisy, creeping bent, common cats ear (*Hypochaeris radicata*), Yorkshire fog, common yarrow (*Achillea millefolium*), common nettle, hard rush (*Juncus inflexus*), cuckoo flower, broadleaved dock (*Rumex obtusifolius*), sedge spp (*Cyperaceae spp*), lesser celandine (*Ficaria verna*), cleaver (*Galium aparine*) and common hogweed (*Heracleum sphondylium*).

- 3.2.6 The other neutral grassland does not meet the criteria as a habitat of principal importance and is not considered to be of particular nature conservation importance. It is therefore only considered further in this assessment in relation to its potential to support protected species.



Photo 1 Other neutral grassland



Photo 2 Other neutral grassland

Modified grassland

- 3.2.7 The majority of the site was comprised of modified grassland that is dominated by ryegrass. The overall species composition of this habitat comprised: creeping bent, Yorkshire fog creeping thistle, creeping buttercup and dock spp.
- 3.2.8 The modified grassland does not meet the criteria as a habitat of principal importance and is not considered to be of particular nature conservation importance. It is therefore only considered further in this assessment in relation to its potential to support protected species.



Photo 3 Modified grassland, Hambridge parcel 2022



Photo 4 Modified grassland, Prior's farm 2022



Photo 5 Modified grassland, Prior's farm 2023



Photo 6 Modified grassland, Prior's farm 2023

Other woodland, broadleaved

- 3.2.9 One parcel within the centre of the Prior's farm parcel was comprised of woodland with well established trees. Bramble dominates the undergrowth and around the edges of the parcel. A small glade was present and used for building storage.
- 3.2.10 A parcel of woodland was also present at the southern boundary of the site, adjacent to the cereal crops. The woodland parcel continues as H24 to the east and is runs alongside to the Emm Brook.
- 3.2.11 The species present within the woodland parcel included: goat willow (*Salix caprea*), pedunculate oak (*Quercus robur*), hazel (*Corylus avellana*), silver birch (*Betula pendula*), dogwood (*Cornus sanguinea*), blackthorn (*Prunus spinosa*), field maple (*Acer campestre*) and ash (*Fraxinus excelsior*).
- 3.2.12 Other broadleaved woodland is not a Habitat of Principal Importance however is considered to be of particular importance for nature conservation. The habitat parcel will be considered further in relation to habitat value and potential to support protected species.



Photo 7 Central woodland



Photo 8 Central woodland

Cereal crops

3.2.13 The Wilson parcel of the proposed development was previously determined to be modified grassland, however in the 2023 UKHab update, it was determined that the field had been ploughed and planed with maize (*Zea mays*) crop, as per the photos below.

3.2.14 The cropland does not meet the criteria as a habitat of principal importance and is not considered to be of particular nature conservation importance.



Photo 9 Wilson parcel crops



Photo 10 Wilson parcel crops

Artificial unvegetated, unsealed surface

3.2.15 A parcel of artificial unvegetated, unsealed surface is present along the eastern boundary of the O'Brien parcel, which was comprised of a horse training field.

3.2.16 The cropland does not meet the criteria as a habitat of principal importance and is not considered to be of particular nature conservation importance.



Photo 11 Horse training paddock in O'Brien parcel.

Developed land, sealed surface

- 3.2.17 A parcel of developed land, sealed surface is present along the northern boundary of the Hambridge Farm parcel; this was comprised of agricultural barns and hardstanding; this buildings are discussed further in Section 3.7.
- 3.2.18 The cropland does not meet the criteria as a habitat of principal importance and is not considered to be of particular nature conservation importance.



Photo 12 Developed land, sealed surface



Photo 13 Developed land, sealed surface

Linear Habitats

3.2.19 The linear habitats on site are shown in Figure 12 and described below.

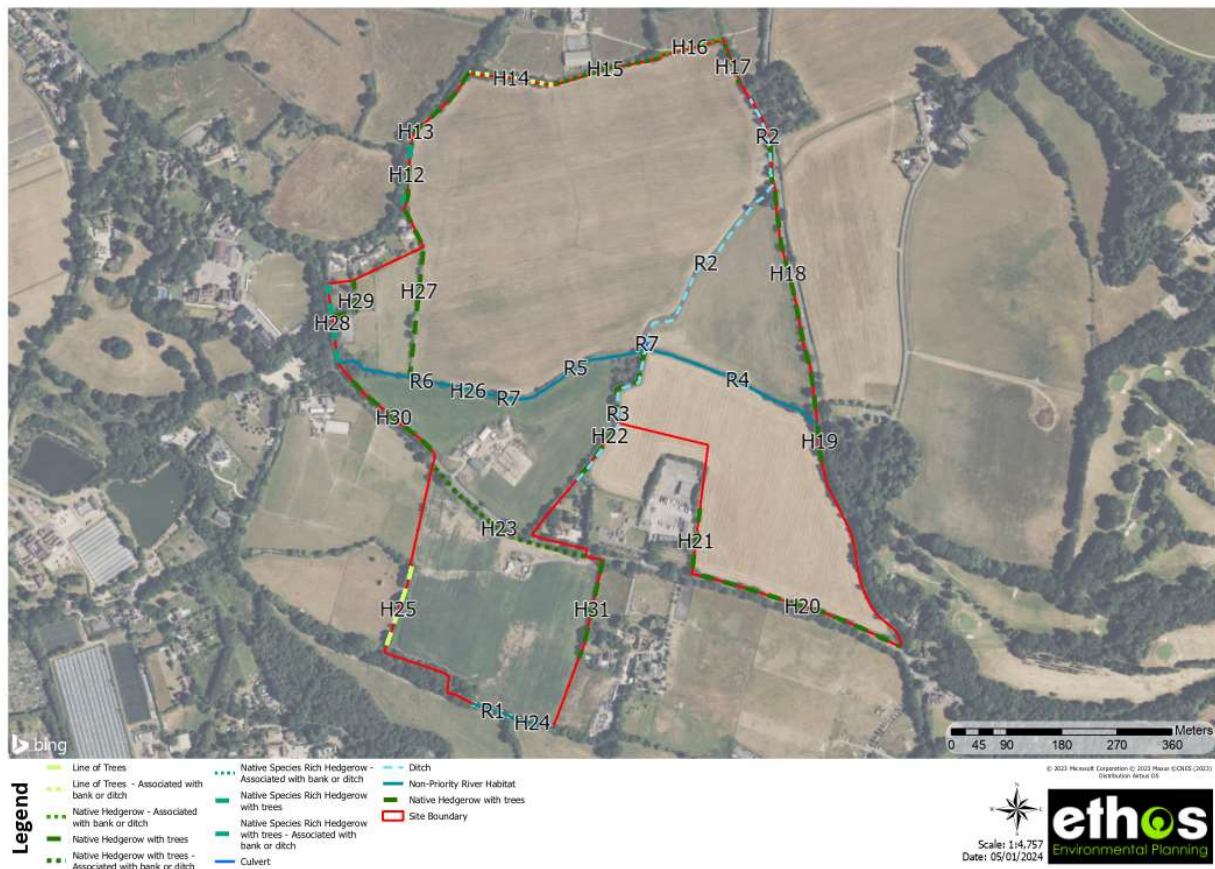


Figure 12 Linear habitats on site

Non-priority river habitat

- 3.2.20 A tributary of the Emm Brook system is located going east to west across the site along the Prior's farm parcel. The watercourse has been heavily shaded and overgrown throughout all surveys undertaken across the site.
- 3.2.21 The Emm Brook is present and running along the southern boundary of the Wilson parcel, located adjacent to a hedgerow and flows into a wooded area (Photos 16 and 17).
- 3.2.22 The tributary and Emm Brook are not Habitats of Principal Importance however are considered to be of **Local** importance for nature conservation. The habitats will be considered further in relation to habitat value and potential to support protected species.



Photo 14 Tributary of Emm Brook



Photo 15 Tributary of Emm Brook



Photo 16 Emm Brook



Photo 17 Emm Brook

Ditch

- 3.2.23 The ditch on site runs from north to south within the proposed development. The habitat is comprised of a vegetated ditch between two of the modified grassland fields on site and is dominated by ruderal vegetation and umbellifer with nettles growing along the banks.
- 3.2.24 The ditch is not a Habitat of Principal Importance however is considered to be of **Local** importance for nature conservation. The habitat will be considered further in relation to habitat value and potential to support protected species.



Photo 18 Overview of ditch



Photo 19 Direct view of ditch

Hedgerows

3.2.25 The below table details the information on the hedgerows across the site.

Hedgerow Number	Type	Description	Photo
H13	Native hedgerow with trees	Hedgerow with mature/veteran oak trees along a double corridor along the byway. Hedgerow is underplanted with a blackthorn hedge. Species include: pedunculate oak, field maple, ash, elder, hawthorn and dog rose.	
H14	Line of trees – associated with bank or ditch	Grown out previous hedge now forming line of trees with minimal understory. Species include: pedunculate oak, ash, cherry (<i>Prunus spp</i>), hawthorn, field maple, dog rose and blackthorn.	
H15	Native hedgerow with trees – associated with bank or ditch	Hedgerow with large volumes of bramble filling in all gaps. Regular trees present throughout and a dry ditch running along the hedge. Species included ash, pedunculate oak, elm, hawthorn, blackthorn, dog rose and elder (<i>Sambucus nigra</i>).	

H16	Native hedgerow – associated with bank or ditch	Hedgerow with a dry ditch running alongside it. Species included blackthorn, pedunculate oak, dog rose, hawthorn, dogwood and goat willow.	
H17	Native hedgerow with trees – associated with bank or ditch	Hedgerow with a ditch running alongside it that includes goat willow, hawthorn (<i>Crataegus monogyna</i>), honeysuckle (<i>Lonicera spp</i>), pedunculate oak, blackthorn, field maple and dog rose (<i>Rosa canina</i>).	
H18	Native hedgerow with trees	Hedgerow dominated by blackthorn with mature and semi mature oak trees present throughout. Hedgerow runs along Old Wokingham Road.	
H19	Native hedgerow with trees	Hedgerow dominated by field maple and English oak. Hedgerow runs along Old Wokingham Road.	
H20	Native hedgerow with trees	Hedgerow dominated by hawthorn and blackthorn. Hedgerow runs along Easthampstead road.	
H21	Native hedgerow with trees	Hedgerow comprised of English oak, goat willow, hawthorn, hazel, ivy and field maple.	

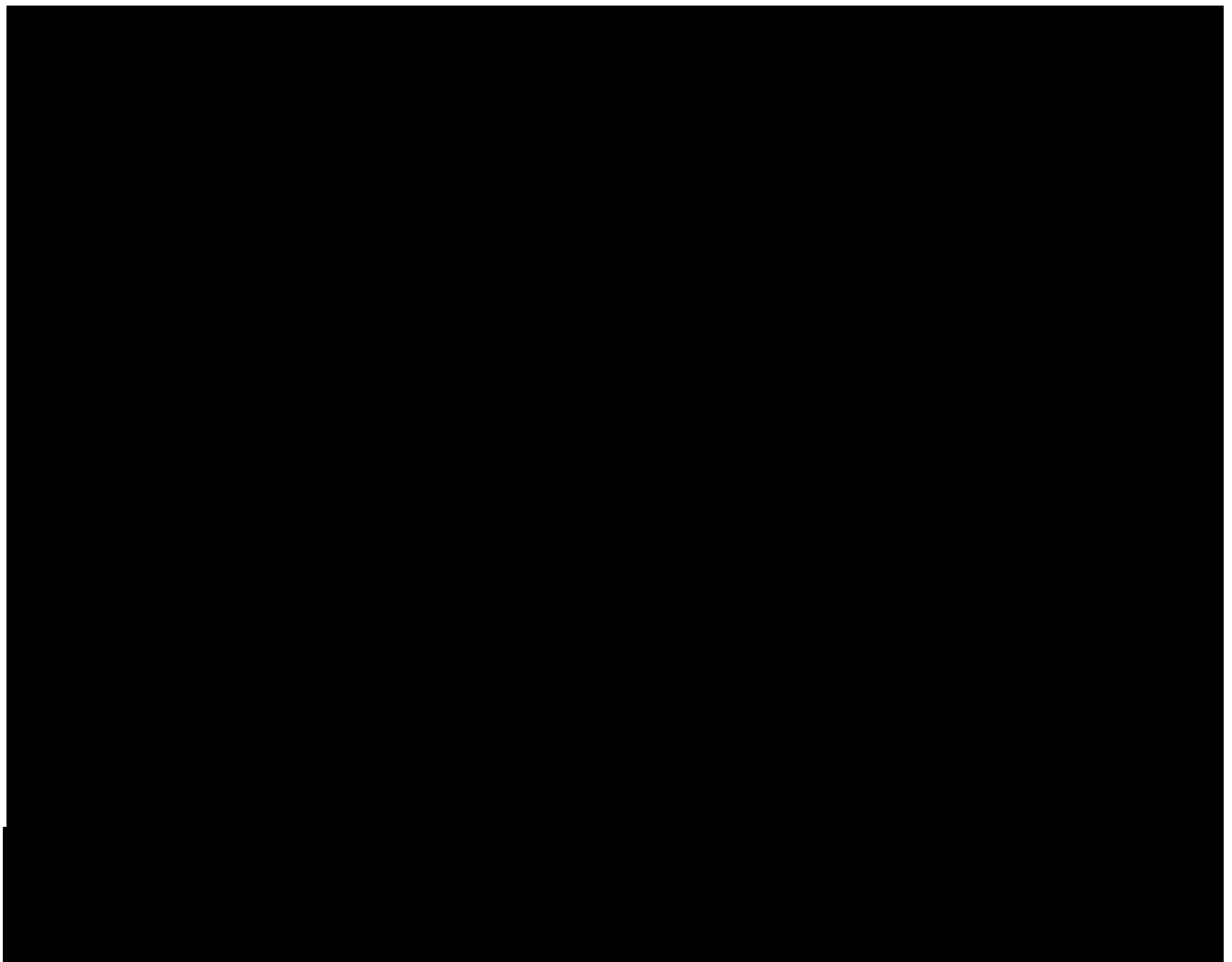
H22	Native hedgerow – with trees	Hedgerow with high bramble occurrence through hedge infilling gaps. Dead elm trees occurring throughout hedgerow. Species include: ash, pedunculate oak, blackthorn, hawthorn and elm.	
H23	Native hedgerow with trees – associated with bank or ditch	Hedgerow comprised of ash, blackthorn, hawthorn, hazel, elm, English oak, field maple, maple, sycamore and goat willow. The hedgerow runs along Easthampstead road.	
H24	Line of trees – associated with bank or ditch	Overgrown hedgerow with minimal understory and running alongside ditch. Bramble and nettle comprised the majority of the ground flora. Species include: alder (<i>Alnus glutinosa</i>) dominating, oak, hazel and blackthorn.	
H25	Line of trees	Hedgerow comprised of English oak, birch and hazel.	
H26	Native hedgerow with trees – associated with bank or ditch	Hedgerow with dense woody vegetation at length of base. Comprises blackthorn, bramble, oak, field maple and ash saplings. Dock and nettle form majority of vegetation adjacent to the ditch.	
H27	Native hedgerow with trees	Blackthorn and hawthorn hedge with occasional trees. The hedge has gaps and large spaces between trees. Species include blackthorn, hawthorn, ash and dog rose.	

H28	Native species-rich hedgerow with trees	Ash, alder, blackthorn, common hawthorn, common hazel, English oak and field maple present.	
H29	Native hedgerow with trees	Hedgerow comprised of hawthorn, birch, English oak and pine spp present.	
H30	Native hedgerow with trees	Hedgerow comprised of alder, ash, common hazel and English oak. The hedgerow runs along Easthampstead road.	
H31	Native hedgerow with trees	Hedgerow comprised of English oak, hawthorn and field maple.	

3.3 NERC S. 41 Mammals

- 3.3.1 A total of 59 records of hedgehog (*Erinaceus europaeus*) within 2km were returned by the data search dated between 2012 and 2022. Whilst no records were from within the site one record was from old Wokingham Road along the northern boundary. The other records were scattered throughout the local area, with the majority of records being located within residential areas approximately 1km to the northeast and northwest of the site, with several records within 1km of the southern boundary.
- 3.3.2 No NERC S.41 mammals were recorded on site, however the camera traps recorded sightings of fox (*Vulpes vulpes*) and roe deer (*Capreolus capreolus*) on site.

- 3.3.3 The site was dominated by modified grassland with hedgerows, which provides good potential habitats for hedgehog and brown hare. The key features for hedgehog were assessed to be the grassland, boundary hedgerow, woodland and scrub areas of the site. The site is bisected by the wider environment via roads, however these are not major roads and do not ecologically disconnect the site from the wider environment. Overall, it was considered that the site held potential for hedgehog and brown hare. It was determined that the site was not suitable for polecat or harvest mouse given the lack of suitable habitat.
- 3.3.4 Hedgehog and brown hare are listed as a Species of Principal Importance for the conservation of biodiversity in England. Any animals using the site are likely to form part of a wider population within the local area, which would be of **Local importance** for nature conservation.



3.5 Hazel Dormouse

- 3.5.1 Two records of hazel dormice (*Muscardinus avellanarius*) within 2km were returned by the data search, records included field signs as well as individuals and were located in Big Wood, Bracknell approximately 300m to the north of the site.
- 3.5.2 155 dormouse nest boxes were deployed in April 2022 across the site in appropriate hedgerows and vegetation and were checked:
- 5th May 2022;
 - 25th August 2022;
 - 27th September 2022;
 - 20th October 2022;
 - 2nd December 2022.
- 3.5.3 Throughout all of the surveys undertaken, no evidence of hazel dormouse was recorded. Several wood mouse (*Apodemus sylvaticus*) and previously used birds nests were recorded within the nest tubes.
- 3.5.4 It has been determined that hazel dormouse are absent from the site and will not be considered further.

3.6 Riparian Mammals

- 3.6.1 No records of otter (*Lutra lutra*) within 2km of the site boundary were returned by the data search.
- 3.6.2 No records of water vole (*Arvicola amphibius*) within 2km of the site boundary were returned by the data search.
- 3.6.3 The site contained riparian habitat in the form of flowing ditches, a tributary of and the Emm Brook and the pond within the residential area onsite; therefore there was minor suitable habitat for riparian mammals. The nearest substantial waterbody is the pond located at Park View Farm immediately adjacent to the eastern boundary of the southern section of the site. The pond is linked via a tributary of the Emm Brook that passes through the centre of the site, along H7. Emm Brook is a tributary of the River Lodden, which in turn is a tributary of the Thames.
- 3.6.4 Otter are exploratory animals that can use small water bodies to explore territories. Water vole prefer slow flowing waterways that also offer vegetative forage and cover opportunities.
- 3.6.5 Otter and water vole surveys were conducted on the 14th April 2022, 19th July 2022 and 5th October 2022 on all watercourses across the site.
- 3.6.6 No direct evidence of otter was recorded on site, however clear mammal trails and paths into the watercourses were recorded. Unidentified mustelid droppings, likely mink, and mammal holes within under hangs along the Emm Brook tributary have been recorded across the watercourses. It has been determined that the site is suitable for otter given the onsite habitats and good connectivity into wider landscape.
- 3.6.7 No direct evidence of water vole was recorded on site, however clear evidence of bank vole (*Clethrionomys glareolus*) has been recorded on site, as per Photos 22 and 23.



Photo 22 Bank vole droppings (with 1p for scale)



Photo 23 Bank vole droppings (with 1p for scale)

- 3.6.8 It has been determined that although no direct evidence of otter or water vole has been recorded on site, the site is highly suitable for both species and other riparian

mammals therefore riparian mammals have been determined to be likely present on site and will be considered further on a precautionary basis.

3.7 Bats

Background data search

- 3.7.1 There were a total of 482 records of bats within 2km returned by the data search. These included Annex II species Bechstein's bat (*Myotis bechstenii*), and barbastelle bat (*Barbastella barbastellus*) of which both were single records from beyond the site boundary. There was also 12 records of unidentified *Myotis sp.*, also beyond the site boundary.
- 3.7.2 The remaining records related to brown long eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), Nathusius's pipistrelle (*Pipistrellus nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctule*), serotine (*Eptesicus serotinus*), and soprano pipistrelle (*Pipistrellus pygmaeus*), as well as unidentified *Plecotus* and *Pipistrellus* species.
- 3.7.3 No records were located within the site boundary however many records relating to roosts or evidence of potential roosts were considered confidential and only provided to 1km accuracy, and therefore the exact location is unknown.
- 3.7.4 Six European Protected Species (EPS) licences were returned within a 2km background data search for bats.
- (2014-4527-EPS-MIT) returned for Brandt's bat, brown long-eared bat, common and soprano pipistrelle and whiskered bat from 2014 – 2025, located 300m south of the site.
 - (2014-4527-EPS-MIT-1) returned for Brandt's bat, brown long-eared bat, common and soprano pipistrelle and whiskered bat from 2015 – 2025, located 300m south of the site.
 - (EPSM2013-5937) returned for common and soprano pipistrelle from 2013 – 2014, located 1.9km south of the site.
 - (EPSM2009-993) returned for common pipistrelle from 2009 – 2011, located 2km northeast of the site.
 - (2018-34805-EPS-MIT) returned for brown long-eared bat and common pipistrelle returned from 2018 – 2023 located 1.3km west of the site.
 - (2018-37587-EPS-MIT-1) returned for brown long-eared bat, common and soprano pipistrelle bats from 2018 – 2023, located 2km north of the site.

Habitat context

- 3.7.5 The hedgerows, line of trees, pond and ditches on site were assessed to be the most valuable features for commuting and foraging bats. The majority of the site was comprised of agricultural cropland with sections of modified grassland, which were

assessed to hold low suitability for bats. The site was connected to several small woodland copses and a larger, connected woodland section in the south-eastern edge of the site. The northern, eastern and western boundary hedgerows provided good connectivity to the wider area. The habitats on site were therefore assessed to have moderate potential for commuting and foraging bats.

- 3.7.6 The wider area was comprised of a network of arable land, hedgerows and small sections of woodland that provides good connectivity from the site to the wider area. There are several small ponds nearby as well as the one onsite that were assessed to hold moderate potential to support foraging bats.

Trees

- 3.7.7 Tree surveys have been undertaken by Quaife Woodland and The Environmental Dimension Partnership (EDP) on the site. It has been determined that some trees will be removed on site for the proposed development, this will need to be considered further.
- 3.7.8 T73 has moderate bat roost potential and will need to be considered further.
- 3.7.9 Indirect impacts will occur on trees across the site e.g, added lighting.

Preliminary roost assessment

- 3.7.10 There are nine structures onsite, which are shown in Figures 14 and 15. One of the structures is a residential dwelling which is in active use and the remaining structures are outbuildings with a predominantly agricultural usage. Descriptions of the buildings onsite are provided in Table 4 below along with their potential for roosting bats.

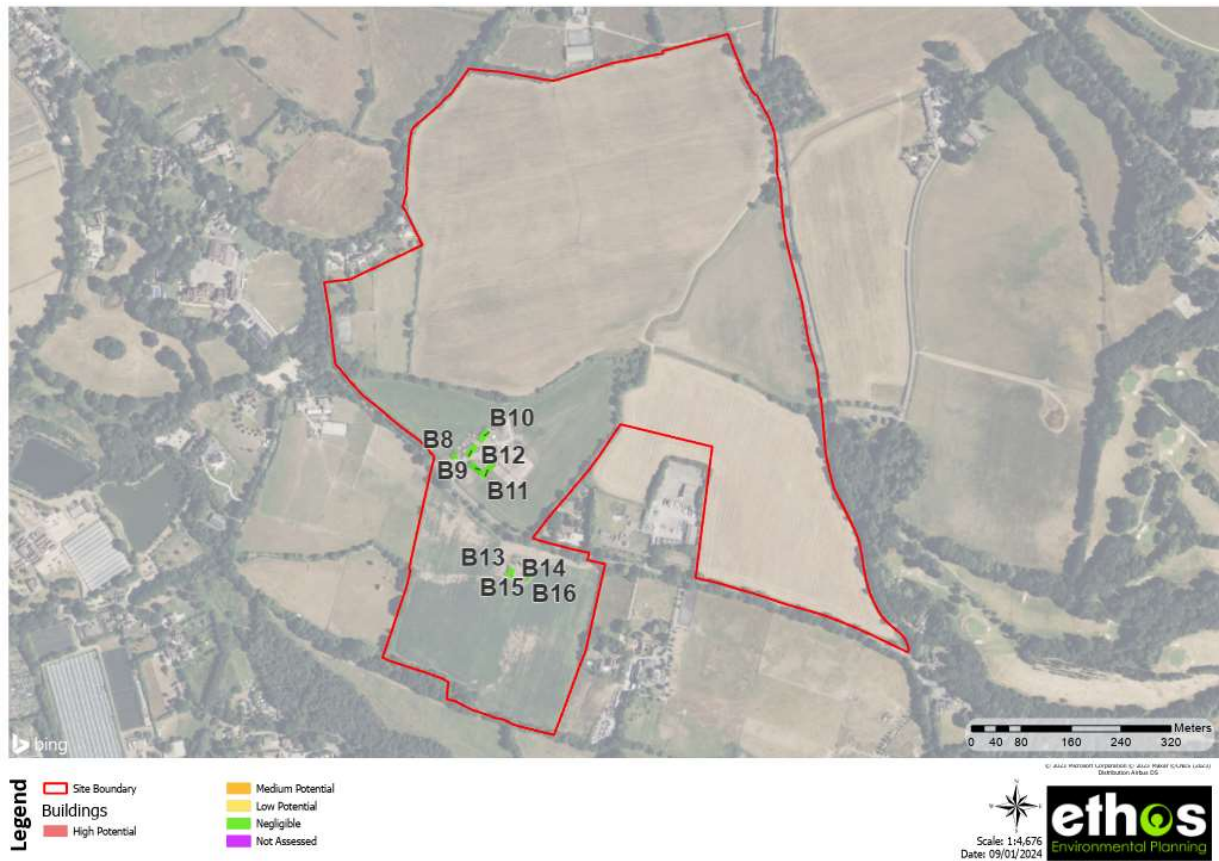


Figure 14 Structures present and assessed on site

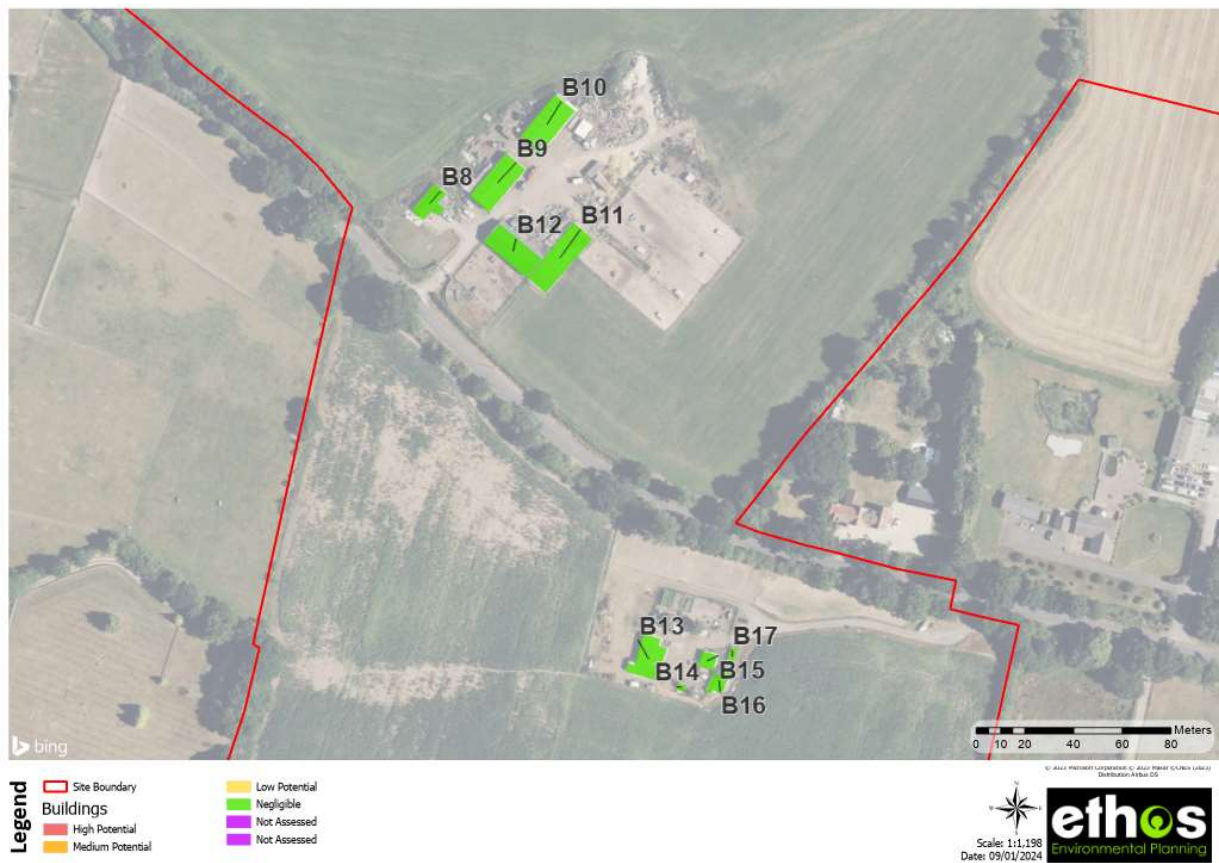


Figure 15 Localised view of structures on site

Table 4 Structures present on site and the bat roost suitability

Building number	Description of structure and evidence of roosting bats	Suitability for roosting bats
B8	Timber residential structure with cross gable felt tiled roof. Open access to porch on eastern elevation to breathable roofing membrane. The remaining externals are well sealed with no suitable access points or features for bats. There are small gaps below the ridge tiles and vents on western elevation and there is a split in the timber panelling on the northern elevation providing potentially suitable crevices for bats. However, these are of limited suitability and the adjacent habitats are of negligible to low value for bats. No evidence of roosting bats observed.	Negligible
B9	Open vaulted and open fronted cow shed. The western aspect is timber panelled and the remaining aspects are open. A breeze block and brick lower wall supports the timber panels on the western aspect. The roof is supported by timber roof joists. The roof is made of corrugated asbestos with plastic skylights. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible
B10	Same construction materials and design as B9. No evidence of roosting bats observed.	Negligible
B11	Agricultural barn which was in construction at the time of survey and therefore had no roof and sides. It is considered that the completed structure will be of the same construction and design as B9 and B10.	Negligible
B12	Open sided and fronted prefab agricultural barn. It has a steel corrugated roof over steel frames and half height concrete blocks. There is no internal loft void and the interior is light, exposed and thermally unstable. No evidence of roosting bats observed.	Negligible
B13	Open fronted and vaulted, corrugated metal and asbestos agricultural barn. A breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible

B14	Open, metal panelled agricultural storage structure. A breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible
B15	Open fronted and vaulted, corrugated metal and asbestos agricultural barn. A breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible
B16	Open access block, wood panel and corrugated metal structure, potential pigsty usage. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible
B17	Corrugated metal, single-storey metal storage container. The structure comprises unsuitable materials for bats. No evidence of roosting bats observed.	Negligible



Photo 24 B8



Photo 25 B8



Photo 26 B9



Photo 27 B9



Photo 28 B10



Photo 29 B12



Photo 30 B12



Activity transect surveys

- 3.7.11 Seven bat activity transect surveys were undertaken between April – October 2022 with eight species recorded, namely: common pipistrelle, soprano pipistrelle, noctule, serotine, brown long-eared bat, Natterer's bat, Daubenton's bat and unknown Brandt's/whiskered bat.
- 3.7.12 The highest levels of activity were recorded in the July surveys. The highest activity levels were recorded across the Emm Brook and along the north east and north west elevations of the site, within the Prior's Farm parcel.
- 3.7.13 *Myotis spp* were only recorded in low levels on two surveys, once in May along the southwest of transect 2 and along three times along the northern boundary of transect 1 in August.
- 3.7.14 The detailed results of the activity surveys are detailed in Appendix 1.

Static detector surveys

- 3.7.15 Twelve species were recorded on the static detectors, namely barbastelle, Bechstein's bat, Brandt's/whiskered bat, brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius's pipistrelle, Natterer's bat, noctule, serotine and soprano pipistrelle.
- 3.7.16 Common pipistrelle comprised 72% of total calls recorded, followed by soprano pipistrelle comprising 22.6% of total calls recorded. Low numbers of barbastelle (0.24%) and Bechstein's bat (0.01%) were recorded across the site.

Table 5 Total calls

Species	Calls	Percentage of Calls
Barbastelle	81	0.24%
Bechstein's Bat	4	0.01%
Brandt's/Whiskered Bat	229	0.67%
Brown Long-eared Bat	316	0.93%
Common Pipistrelle	24422	71.96%
Daubenton's Bat	134	0.39%
Leisler's Bat	11	0.03%
Nathusius' Pipistrelle	84	0.25%
Natterer's Bat	72	0.21%

Noctule	854	2.52%
Serotine	56	0.16%
Soprano Pipistrelle	7677	22.62%
Grand Total	33940	100.00%

3.7.17 Location B2 recorded the highest bat calls with some significance across the site, as seen in Table 4 below, however this was dominated by common pipistrelle calls. The peaks in bat calls recorded were in June and July.

3.7.18 Barbastelle bats were recorded across all detectors and Bechstein's bats were only recorded at location B1.

Table 6 Total calls per detector

Species	Location B1	Location B2	Location B3	Location B4
Barbastelle	6	10	46	19
Bechstein's Bat	4	0	0	0
Brandt's/Whiskered Bat	3	163	39	24
Brown Long-eared Bat	75	66	125	50
Common Pipistrelle	2195	18802	1833	1592
Daubenton's Bat	28	59	10	37
Leisler's Bat	2	2	4	3
Nathusius' Pipistrelle	5	50	24	5
Natterer's Bat	32	7	3	30
Noctule	201	272	161	220
Serotine	22	16	6	12
Soprano Pipistrelle	761	3921	1480	1515
Grand Total	3334	23368	3731	3507

3.7.19 The detailed results of the static detector surveys are detailed in Appendix 1.

3.8 Birds

Background data search

3.8.1 A total of 1169 records of birds within 2km were returned by the data search. Records included Schedule 1 species; black redstart (*Phoenicurus ochruros*), brambling (*Fringilla montifringilla*), crossbill (*Loxia curvirostra*), fieldfare (*Turdus pilaris*), firecrest (*Regulus ignicapilla*), green sandpiper (*Tringa ochropus*), hobby (*Falco subbuteo*), kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), red kite (*Milvus milvus*), redwing (*Turdus iliacus*), and wood lark (*Lullula arborea*).

3.8.2 Returned records also included and Amber and Red List species; barnacle goose (*Branta leucopsis*), black-headed gull (*Chroicocephalus ridibundus*), bullfinch (*Pyrrhula pyrrhula*), common gull (*Larus canus*), common redpoll (*Acanthis flammea*), common

sandpiper (*Actitis hypoleucos*), common tern (*Sterna hirundo*), cuckoo (*Cuculus canorus*), dunnoek (*Prunella modularis*), gadwall (*Mareca strepera*), greenfinch (*Chloris chloris*), grey wagtail (*Motacilla cinerea*), greylag goose (*Anser anser*), hawfinch (*Coccothraustes coccothraustes*), herring gull (*Larus argentatus*), house martin (*Delichon urbicum*), house martin (*Passer domesticus*), kestrel (*Falco tinnunculus*), lapwing (*Vanellus vanellus*), lesser black-backed gull (*Larus fuscus*), lesser spotted woodpecker (*Dryobates minor*), linnet (*Linaria cannabina*), mallard (*Anas platyrhynchos*), meadow pipit (*Anthus pratensis*), mistle thrush (*Turdus viscivorus*), moorhen (*Gallinula chloropus*), nightjar (*Caprimulgus europaeus*), pochard (*Aythya farina*), redstart (*Phoenicurus phoenicurus*), reed bunting (*Emberiza schoeniclus*), ring ouzel (*Turdus torquatus*), rook (*Corvus frugilegus*), sedge warbler (*Acrocephalus schoenobaenus*), shoveler (*Spatula clypeata*), skylark (*Alauda arvensis*), snipe (*Gallinago gallinago*), song thrush (*Turdus philomelos*), sparrowhawk (*Accipiter nisus*), spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*), stock dove (*Columba oenas*), swift (*Apus apus*), tawny owl (*Strix aluco*), teal (*Anas crecca*), tree pipit (*Anthus trivialis*), turtle dove (*Streptopelia turtur*), wheatear (*Oenanthe oenanthe*), whinchat (*Saxicola rubetra*), whitethroat (*Curruca communis*), widgeon (*Mareca penelope*), willow warbler (*Phylloscopus trochilus*), woodcock (*Scolopax rusticola*), woodpigeon (*Columba palumbus*), and wren (*Troglodytes troglodytes*).

- 3.8.3 No Schedule 1 or Red and Amber List species records were located within the site, however many of the records were given to 1km or 2km accuracy and therefore the exact location of these records is unknown.

Habitat assessment

- 3.8.4 The habitats on site were dominated by modified grassland which provides some, however restricted opportunity for ground nesting birds.
- 3.8.5 As the background data search has returned records of ground nesting birds i.e., skylark and lapwing, and there is some suitable habitat on site, it has been determined that the site provides some potential habitat for breeding ground nesting birds.
- 3.8.6 The scrub areas, woodland and boundary hedgerows could also provide potential breeding habitats for common and widespread species of birds.
- 3.8.7 It was considered that the ditch and stream on site may provide some potential habitat for common species of waterfowl but as water levels were very low, the suitability of habitats for waterfowl was poor.

3.9 Reptiles

Background data search

- 3.9.1 A total of 117 records of reptiles within 2km of the site boundary were returned by the data search dated from between 1995 and 2023. Records included adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix natrix*), and slow worm (*Anguis fragilis*).
- 3.9.2 Slow worm accounted for 90 of the records, no records were from on site with the majority of records coming from areas either approximately 600m to the north or 600m to the southeast of the site. The closest record was located 520m to the southeast of the site.
- 3.9.3 There were 8 records of grass snake returned, the closest of which was located approximately 590m east of the site, other records were 1.25 – 1.45km from the site boundary.
- 3.9.4 There were 17 records of common lizard, the closest of which was approximately 620m north of the site. The most recent record from 2023 is from Gorick plantation, approximately 1.4km to the south west of the site.
- 3.9.5 Only two records of adder within 2km were returned by the data search, dated 1997 and 2018, the latter of which is the closest being located in Beaufort park 1km to the south east of the site.

Habitat assessment and survey results

- 3.9.6 The site was dominated by grassland, which, in the tussocky areas can provide good foraging habitat for reptiles, along with the network of hedgerows and watercourses. The well-managed modified grassland was not considered suitable habitat for reptiles.
- 3.9.7 The site also contained suitable habitat and hibernation opportunities for a population of reptiles, for example within the woodland and woodland edge habitats. The site was connected to suitable reptile habitat in the wider environment on all boundaries.
- 3.9.8 Seven surveys were undertaken between May – October 2022 on areas of suitable reptile habitat. The results of each survey are detailed below in Table 7. Throughout the reptile surveys, the highest count recorded was 7 grass snakes recorded on one survey. One slow worm was also recorded on site.

Table 7 Reptile survey results

Survey number	Date	Temp (Celsius)	Wind (m/s)	Humidity (%)	Cloud cover (Oktas)	Results
1	05/05/2022	15	8	63	5	None
2	12/05/2022	18	4	45	6	5 grass snakes
3	16/05/2022	18	1.6	61	5	7 grass snakes
4	01/06/2022	17	0.8	56	7	1 grass snake and 1 slow worm
5	23/08/2022	19	0.9	73	3	None

Survey number	Date	Temp (Celsius)	Wind (m/s)	Humidity (%)	Cloud cover (Oktas)	Results
6	27/09/2022	16	0	70	7	None
7	05/10/2022	17	7	83	8	None

3.9.9 Overall, low numbers of slow worm and grass snake have been recorded, determining that **‘low’ populations of slow worm and a ‘good’ population of grass snake** are present on site, as per Froglife Advice Sheet 10. Both slow worm and grass snake are Species of Principal Importance in England and are therefore assessed to be of **Local importance** for nature conservation.

3.10 Amphibians

3.10.1 The data search returned a total of 89 amphibian records within 2km of the site. Records related to great crested newt (*Triturus cristatus*), palmate newt (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*) and were dated from between 1998 – 2023.

3.10.2 Of these records 24 were great crested newt, two of which were in close proximity to the site; 1 lies within a residential garden approximately 60m beyond the northern site boundary and the other lies within a residential garden approximately 90m beyond the most western edge of the boundary.

3.10.3 UK BAP species common toad accounted for 15 of the recorded dated from between 1998 and 2021. The closest of these records was approximately 375m west of the site within fishing ponds.

3.10.4 No EPS licences relating to GCN were identified by the data search.

Habitat assessment

3.10.5 The site was dominated by modified grassland which provides some suitable terrestrial habitat for amphibians due to some, but not a range of foraging and cover opportunities; the other neutral grassland habitat of the site also comprised grazing horses. It was considered that the key features on site are the waterways and fringe habitats.

3.10.6 Overall, connectivity of suitable GCN habitat in the local area is good as the site is bordered by grassland fields, hedgerows and local roads, which do not ecologically cut off the site. The arable fields nearby do not provide suitable habitat as they have a distinct lack of cover opportunities suitable for GCN.

3.10.7 Two waterbodies are located immediately outside of the red line and were subject to HSI's (Ponds 3 and 4). The HSI of pond 3 was 0.297, which gives a classification of 'poor' regarding its suitability to support GCN. The HSI of pond 4 was 0.353, which gives a

classification of 'poor' regarding its suitability to support GCN. Ponds 3-4 were both man-made fishponds and were both assessed as unsuitable for GCN due to the high concentration of fish within them. Environmental DNA analysis was carried out on both ponds with a negative and indetermined result. The latter result is believed to be due to sample degradation.

- 3.10.8 A search for ponds within 500m of the site identified a total of 23 around the site. Ponds 5-12 are located on private land and could not be accessed for the survey.
- 3.10.9 Ponds 5-12, which could not be assessed, were considered a significant distance from the site and separated by barriers to dispersal, including a main road. Therefore, GCN within these ponds would be unlikely to be impacted by the development.

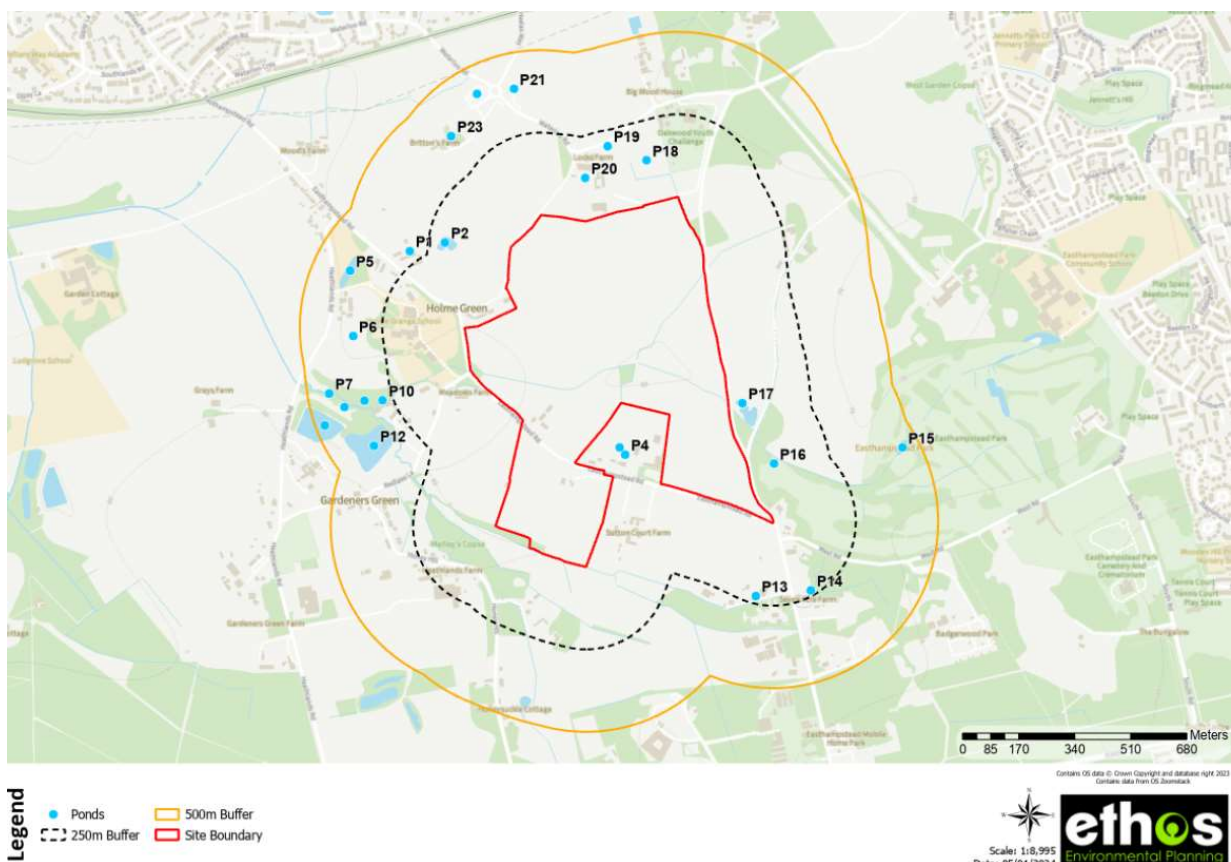


Figure 16 Ponds within 500m of the site

eDNA survey

- 3.10.10 The eDNA of the two ponds immediately adjacent to the southern boundary of the site, between the site and Easthampstead Road are absent from the pond. Full results are shown in Appendix 10.8. Therefore, GCN are considered to be absent from the site and are not considered further in this appraisal.

3.11 Invertebrates

- 3.11.1 A total of 144 records of invertebrates within 2km of the site were returned by the data search dated between 1993 and 2023, 98 of the records related to nationally scarce stag beetle (*Lucanus cervus*), all of which were beyond the site boundary the closest record was located within residential gardens at Holme Green just beyond the western edge of the site. The records were scattered around the local area with the majority coming from residential gardens approximately 1km to the north west. Other notable species records include Schedule 41 species small heath (*Coenonympha pamphilus pamphilus*), blood vein moth (*Timandra comae*), cinnabar moth (*Tyria jacobaeae*), dot moth (*Melanchra persicariae*), forester moth (*Adscita statices*), knot grass moth (*Acronicta rumicis*), olive crescent moth (*Trisateles emortualis*), rustic moth (*Hoplodrina blanda*), shaded broad-bar moth (*Scotopteryx chenopodiata*), and white ermine moth (*Spilosoma lubricipeda*) none of which were located within the site boundary.
- 3.11.2 The site was dominated by modified grassland, which provides low habitat for invertebrates. The key features were assessed to be the waterways and mature trees in the hedgerows which could provide potential habitat for invertebrates. Given the large number of stag beetles within the background data search and the site provides suitable habitat, it has been determined that they are likely present on site.

3.12 Invasive Species

- 3.12.1 Records of American skunk-cabbage (*Lysichiton americanus*), buddleia (*Buddleja davidii*), Himalayan balsam (*Impatiens glandulifera*), rhododendron (*Rhododendron ponticum*) and *Crangonyx pseudogracilis/floridanus* have been recorded within 2km of the site; all records besides *Crangonyx pseudogracilis/floridanus* were located over 1km from the site. Records of *Crangonyx pseudogracilis/floridanus* are present on the Emm Brook along the south of the site.
- 3.12.2 Mink (*Meogale vison*) have been recorded along the tributary of the Emm Brook on site within the camera trap surveys.

REFERENCES

Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARGUK.

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

BTHK (2018) Bat Roosts in trees: A Guide to Identification and Assessment for Tree-care and Ecology Professionals. Exeter: Pelagic Publishing.

Chanin, P. (2003) Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No.10. English Nature, Peterborough.

CIEEM (2016) UK Guidelines for Accessing and Using Biodiversity Data. Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester.

CIEEM (2017) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.2 (updated April 2022). Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6.

Countryside and Rights of Way Act 2000.

Available at: <http://www.legislation.gov.uk/ukpga/2000/37/contents>

Dean, M., Strachan, R., Gow, D., Andrews, R. (2016) The Water Vole Mitigation Handbook. The Mammal Society Mitigation Guidance Series. Eds Fiona Mathews and Paul Channin. The Mammal Society. London

Defra (2007) Hedgerow Survey Handbook. A Standard Procedure for Local Surveys in the UK. Department for Environment, Food and Rural Affairs, London.

English Nature (2001) Great Crested Newt Mitigation Guidelines.

Froglife (1999) Reptile Survey: An Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Gent, T. and Gibson, S. (2003). Herpetofauna Workers Manual. JNCC, Peterborough.

Harris, S., Cresswell, P. and Jefferies, D. J. (1989) Surveying Badgers. Issue 9 of Occasional Publication of the Mammal Society. ISBN- 978-0906282069.

JNCC (2010) Handbook for Phase 1 Habitat Survey. A Technique for Environmental Audit. JNCC, Peterborough. ISBN-978-0-86139-636-8.

John Simpson Architects Ltd (2023^a) *Project Area Plan, Phase 4b, 4c & 4c(i) of the South Wokingham SDL Extension*. Drawing No: SK014F, Rev F.

John Simpson Architects Ltd (2023^b) *Project EIA Illustrative Masterplan, Phase 4B, 4C, 4C(i) of the South Wokingham SDL Extension*. Drawing No: SK02.4.1G.

Jukes, A (2021) Considering Invertebrates in Preliminary Ecological Appraisals. In Practice. 40-45, Issue 111. CIEEM.

Langton, T. E. S., Beckett, C. I., and Foster, J. P. (2001) Great Crested Newt Conservation Handbook, Froglife, Halesworth.

Mitchell-Jones, A. J. (ed.) (2004) Bat Mitigation Guidelines. English Nature, Peterborough. ISBN-1 85716-781-3.

Mitchell-Jones, A.J, & McLeish, A.P. Ed., (2004) 3rd Edition Bat Workers' Manual, 178 pages b/w photos, softback, ISBN-1 86107 558 8.

National Planning Policy Framework (2018). Available at:
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

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

Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management, Ampfield.

The Conservation of Habitats and Species Regulations 2017 (as amended) Available at:
<https://www.legislation.gov.uk/ukdsi/2019/9780111176573/contents>

UKHab Ltd. (2023) UK Habitat Classification Version 2.0. Available at: www.ukhab.org

Wildlife and Countryside Act 1981. Available at:
<http://www.legislation.gov.uk/ukpga/1981/69>

APPENDIX 1 – BAT ACTIVITY SURVEY DATA

The following section details the results of the bat surveys at the site. Codes used in the description of bat species are as follows:

CP	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)
SP	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)
NOC	Noctule bat (<i>Nyctalus noctula</i>)
SER	Serotine bat (<i>Eptesicus serotinus</i>)
MYODAU	Daubenton's bat (<i>Myotis daubentonii</i>)
MYONATT	Natterer's bat (<i>Myotis nattereri</i>)
WHI/BRA	Whiskered/Brandt's bat (<i>Myotis mystacinus/ brandti</i>)
BLE	Brown long-eared bat (<i>Plecotus auritus</i>)

A summary of the bat activity surveys is included below, and the environmental variables recorded during the surveys are shown in Table 6.

Table 8 Emergence surveys environmental variables

Date	14/04/2022		16/05/2022		23/06/2022		19/07/2022		30/08/2022		27/09/2022		20/10/2022	
Sunset/Sunrise	19:57		20:49		21:20		21:10		19:48		18:50		18:00	
Start / End time	19:57	22:02	20:56	00:23	21:20	23:38	21:10	23:10	19:48	22:01	18:50	20:44	18:00	20:00
Temperature (°C)	13	10	15	14	19	19	26	23	21	21	15	10	10	9
Humidity (%)	67	88	80	85	77	82	56	67	65	64	75	86	100	
Cloud cover (oktas)	8	6	2	4	8	0	7	1	1	0	7	6	8	
Avg. Wind speed (m/s)	0.9	1.4	10	10	0.4	0.4	n/a	0.4	1.1	0	0	0.8	0	0
Rain	None		Earlier today		None		Earlier today		None		Earlier today		None	

14th April 2022 – Transect 1 (Priors Farm)

- First bat 20:29 SP commuting east into woodland at B3
- 20:35 SP HNS B4
- 20:31 SP HNS brief quiet pass B6
- 20:58 SP HNS by road south of B7
- Same 21:00
- 21:10 CP commuting South along ditch south of B8
- 21:11 SP faint calls B8
- 21:14 SP foraging B8
- 21:17 CP HNS B9
- 21:18 CP 2 passes HNS B8
- 21:20 CP commuting east B8

- 21:31 SP HNS commuting B11

14th April 2022 – Transect 2 (Jeater, O'Brien and Hambridge Farm)

- 20:29 CP foraging by C5 highland cattle building. SP forage by Hambridge Emm Brook hedgerow corridor.
- 20:36 NOC west end of Emm Brook - NOC was foraging at top of oak, 2 bats seen here.
- 20:48 SP forage along Jeater hedgerow.
- 20:49 CP commute along Jeater hedgerow.
- 20:58 CP south of Jeater foraging along Emm Brook and also a SP same location.
- 21:02 CP foraging by trees on Emm Brook, continuing to forage from earlier.
- 21:11 CP forage by hedgerow between Hambridge and prior residential, social calls heard.
- 21:19 CP forage by Emm Brook.
- 21:31 SP commute by hedgerow at east of Jeater.
- 21:40 south of Jeater by Emm Brook SP HNS.
- 21:43 2 x SP Emm Brook mature trees 1 pass.

16th May 2022 – Transect 1 (Priors Farm)

Started at B2.

- 21:28 SP commuting west to east, north of Emm brook.
- 21:45 X3 CP foraging along Emm Brook, on the north side (north of B5) and in corner of field opposite B5.
- Foraging bout on-going (21:51)
- 22:05 CP foraging (HNS) at B8
- 22:22 CP foraging at B10 (HNS - north side of hedgerow?)
- 22:32 CP faint foraging (HNS) by B12
- 22:24 SP commuting in field near Hambridge B1, NW to SE
- 22:52 CP foraging B1, HNS

16th May 2022 – Transect 2 (Jeater, O'Brien and Hambridge Farm)

- B2 – SP HNS quick pass at 21:18
- B3 – SP foraging along southern roadside hedgerow
- 21:38 SP and CP faint foraging HNS between C3 and C4 along the ditch
- B4 – CP HNS social calling and foraging at 21:45. Possible BLE HNS at 21:44. NOC foraging at 21:47.
- 21:51 CP HNS faint pass coming up to C5 along the ditch
- B5 21:54 several CPs and two SP foraging along ditch, SPs social calling
- 21:50 high CP and SP foraging activity along ditch between C5 and C6, SPs social calling
- 22:03 CP foraging along southern boundary of Jeater
- 22:12 SP HNS faint pass eastern boundary of Jeater after C6
- 22:14 high CP and SP foraging activity along ditch between C6 and C1
- B1 - 22:18 high CP and SP foraging activity and social calling

- B2 - 22:27 CP HNS quick pass
- 22:30 CP HNS quick pass just after C2
- B3 - 22:33 CP foraging and SP faint call HNS
- 22:44 – SP and CP faint pass coming up to C5
- 22:48 - NATT faint call just before C4
- B4 - 22:49 CP faint foraging with social calls
- B5 - 22:54 CP foraging

23rd June 2022 – Transect 1 (Priors Farm)

- 22:18 SP HNS at B7 brief pass;
- 22:21 SP faint foraging around trees at site boundary between B7-8.
- 22:23 CP as above
- 22:28 CP HNS foraging near B6 on inner field boundary
- 22:30 SP as above
- 22:35 foraging CP and SP on inner field grassland strip/ditch between B7-8. South west of B8. Seen out in the open but mostly foraging along strip
- 22:40 CP foraging at B8 HNS around trees
- 22:42 x2 CP and SP foraging along field edge heading south west
- 22:44 SP social harmonics HNS just after B8 around trees at road edge
- 22:49 CP HNS B9
- 22:56 CP faint HNS B10, foraging
- 22:31 BLE off transect along site boundary near corner of field to south of B1. Just outside MOT centre.

Common pip and soprano pipistrelle. Most activity around B8 and foraging around trees and hedgerow. BLE at the end.

23rd June 2022 – Transect 2 (Jeater, O'Brien and Hambridge Farm)

- 21:39 NOC commuting south over C1
- 21:57 NOC commuting south of C6. NOC continued to forage
- 22:14 SP foraging along mature tree belt west of C1
- 22:21 CP foraging over C2
- 22:31 CP foraging above C5, HNS
- 22:35 CP foraging above C5
- 22:45 2X CP foraging on corner west of C1

19th July 2022 – Transect 1 (Priors Farm)

- 21:48 NOC faint HNS just after B14
- 21:49 2 x NOC commuting and socialising after W of B6
- 22:53 NOC foraging over large field Along Transect W of B6 stretch 14-13
- 22:01 NOC HNS B13 -12
- 22:03 Faint CP HNS at B12

- 22:04 NOC foraging over B12
- 22:05 CP foraging HNS at B12
- 22:08 NOC pass at B12
- 22:10 NOC pass B12-11
- 22:11 NOC, CPHNS at B11
- 22:13 SP faint HNS at B11
- 22:15 NOC foraging HNS at B11
- 22:21 2 NOC HNS at B10
- 22:21 SP HNS at B10
- 22:22 SP at B10
- 22:24 CP HNS B10-9
- 22:27 CP HNS at B9
- 22:29 CP foraging around trees at B9
- 22:30 SER HNS at B9
- 22:34 SER just S of B9 HNS
- 22:34 SER pass at B9 HNS
- 22:55 SER in corner S of B6
- SP pass at B6

30th August 2022 – Transect 1 (Priors Farm)

- 20:12 NOC commuting at B3 HNS.
- 20:24 SP x 2 forage at B5 in rough grassland at field margin.
- 20:28 2 x SP forage along Emm Brook by B5.
- 20:33 NOC forage in field by Emm Brook then Head off to east of site main road.
- 20:37 NOC HNS B6.
- 20:48 SP along north east corner of site.
- 20:49 CP same location also commute.
- 20:51 SP HNS at B7 1 pass also probs commute, CP same place.
- 20:56 CP at south of hedgerow B8 forage also SP same location: also SER same location forage.
- 21:15 CP forage south of B8.
- 21:19 CP commute north of B8 1 pass.
- 21:23 DAUB at north east corner B9.
- 21:27 SP forage slightly east of B10.
- 21:30 MYO poss MYOBRA at B10 1 pass likely commute.
- 21:35 MYO BRA/WHISK at northern boundary of site forage, then CP forage at B11.
- 21:40 B13 CP HNS.

27th September 2022 – Transect 2 (Jeater, O'Brien and Hambridge Farm)

- 19:21 SP seen commuting west to east along hedgerow by C5.

20th October 2022 – Transect 1 (Priors Farm)

- 18:36 CP forage around confluence of ditch and hedge at B8
- 18:39 SP forage along roadside hedge between B8/9
- 18:42 CP forage along northern most hedge
- 18:48 SP forage along hedgeway of byway
- End of loop one – 19:00
- 19:09 CP forage single call hns B5
- 19:32 SP forage along edge of roadside hedge between B8/9
- End loop two at 20:00

20th October 2022 – Transect 2 (Jeater, O'Brien and Hambridge Farm)

- Very low activity, low level CP and SP commuting along the tributary of the Emm Brook corridor throughout the survey. No other bats.

APPENDIX 2 – BAT STATIC DETECTOR DATA

The following section details the results of the bat static detector surveys at the site.

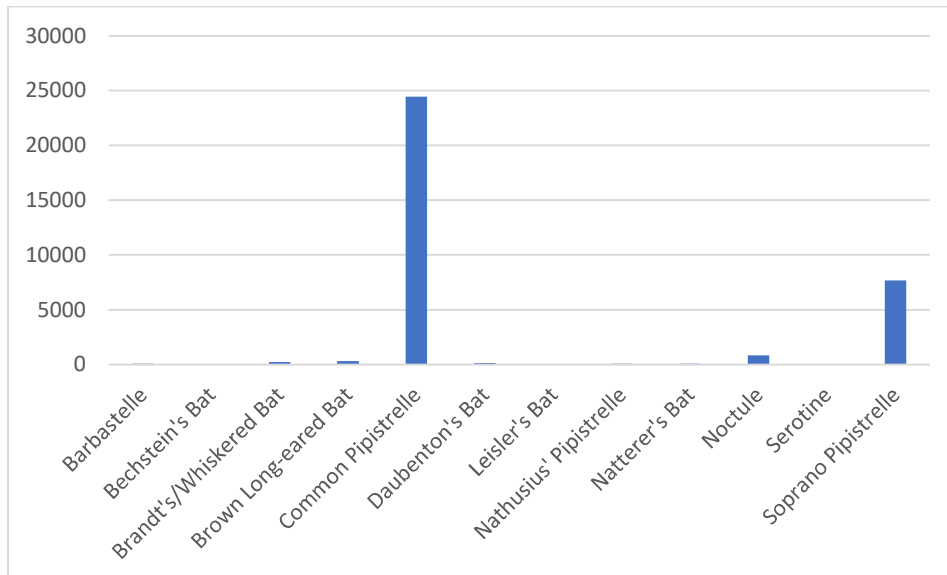


Figure 17 Total bat calls across the site

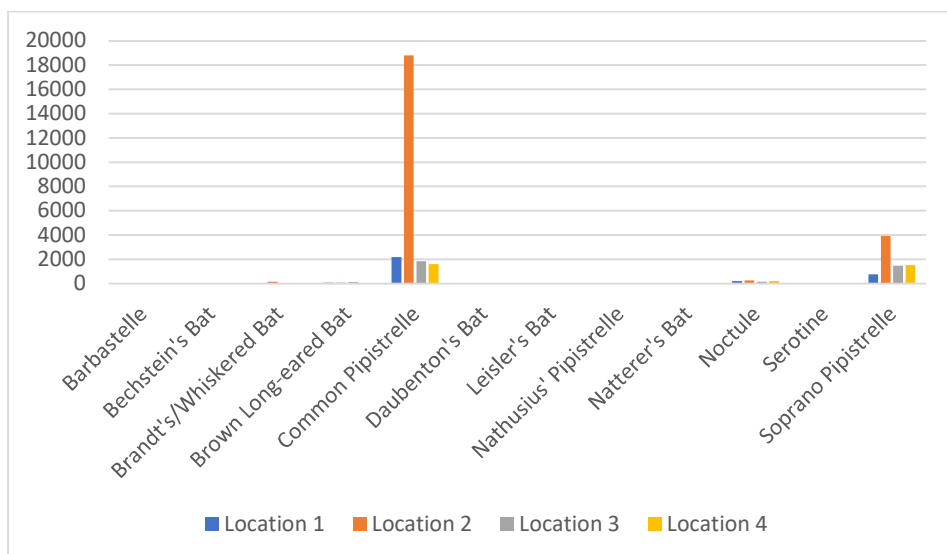


Figure 18 Total calls per location

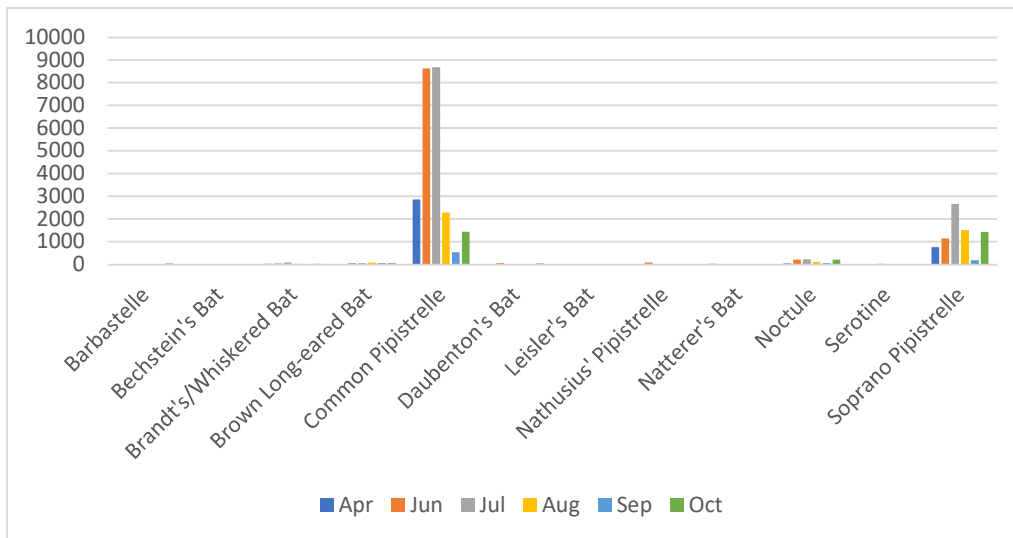


Figure 19 Total calls per month

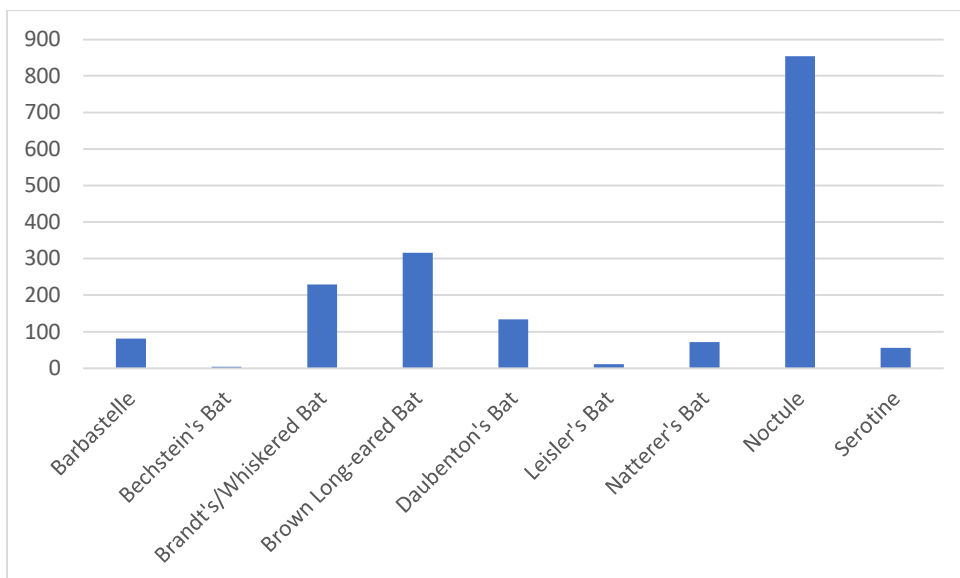


Figure 20 Total calls without pipistrelle bats

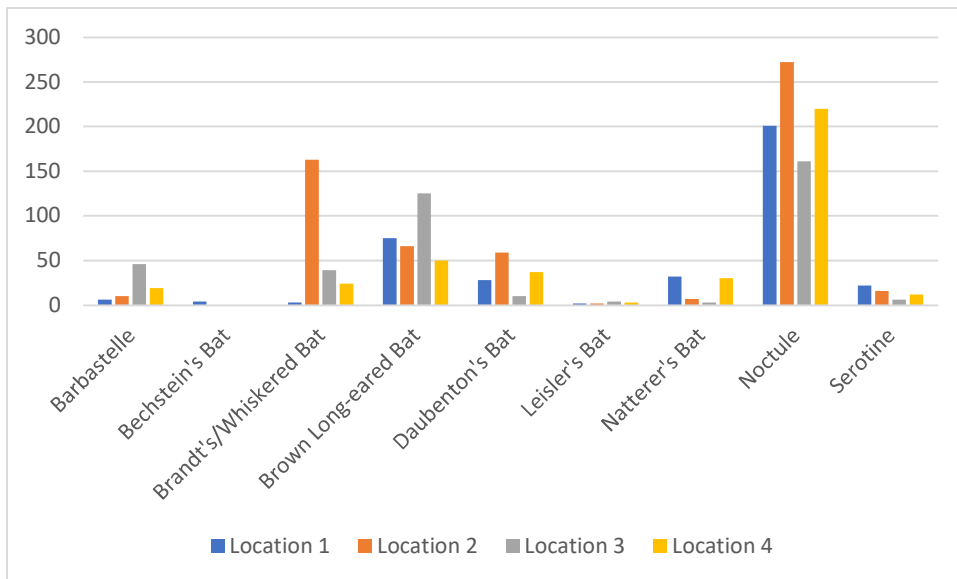


Figure 21 Total calls per location without pipistrelle bats

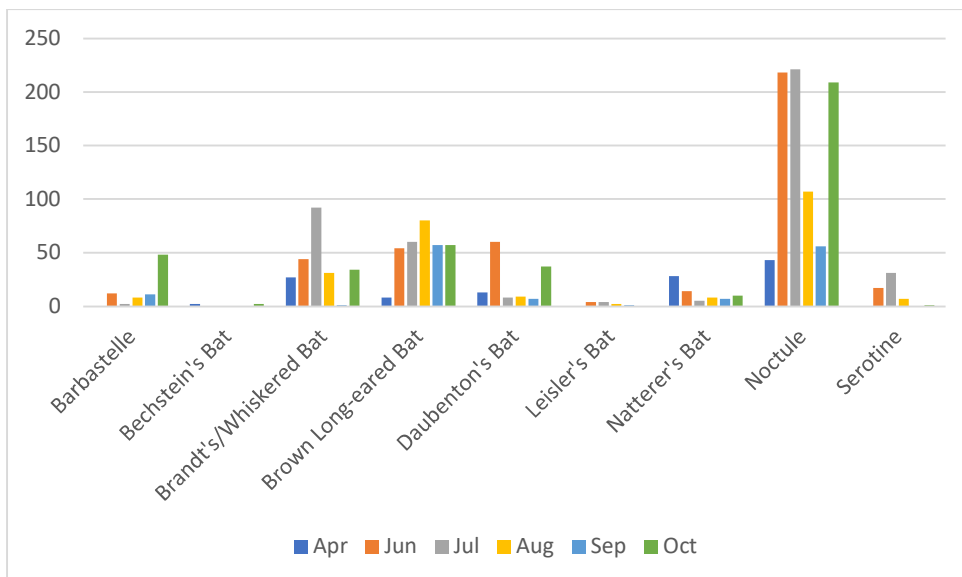


Figure 22 Total calls per month without pipistrelle bats