

Protected Species Survey

**199 – 203 Henley Road & land to rear of
205-207 Henley Road, Caversham**



September 2019

Ecology | Green Space | Arboiculture | GIS

Unit 2 The Old Estate Yard | North Stoke Lane
Upton Cheyney | Bristol | BS30 6ND

info@ethosep.co.uk | 01179328203

www.ethosep.co.uk



Report Produced for Signature Senior Lifestyle Developments Ltd.

Written by: Kane Burchill, Ecologist

Checked by: Charlie Fayers, Principal Ecologist

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EXECUTIVE SUMMARY

Introduction	- The site was located land at 199 – 203 Henley Road and land to the rear of 205 – 207 Henley Road, Caversham, RG4 6LJ, (central grid reference: SU 73014 75214); - The development proposals include demolition of existing structures and redevelopment to form a care home (Class C2), communal and ancillary facilities, associated parking and landscaping;
Surveys undertaken	- A preliminary ecological survey was undertaken in February 2019 in order to identify the main habitats present on site and the potential for protected species; - The preliminary ecological survey identified the potential for bats, badger, otters, birds, reptiles and hedgehog on or adjacent to the site, and recommended further targeted surveys for bats, badgers, otters and reptiles; - The results of the preliminary ecological appraisal are detailed in a separate report by Ethos, April 2019
Ecological constraints	- Emergence surveys identified structures 199, 201 and 203 as bat roosts for low numbers of common pipistrelle, soprano pipistrelles, Daubenton's and brown long-eared bats; - Tree T85 at the western boundary is a roost for one common pipistrelle bat. It is being retained within development proposals; - The hedgerow 4 was assessed as being a key feature for foraging and commuting bats; - Reptile surveys identified a low population of grass snake on site; - Camera trap surveys identified one outlier badger sett on the southern boundary of the site - No presence of breeding birds was found in any of the structures;

Recommendations	• A European protected species licence will be required for demolition of 199, 201 and 203 Henley Road; • A wildlife buffer area will be created in the south of the site featuring a mosaic of grassland, scrub and tree thickets; • Bird and bat boxes will be installed on the new structures and retained vegetation; • Footpath re-routed at southern boundary to ensure 10m buffer to badger sett entrance, soft landscaping features used to buffer sett entrance and footpath. • Reptiles will be moved to the southern area of the site using habitat manipulation.
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1.0 INTRODUCTION

Ethos Environmental Planning (Ethos) have undertaken this Protected Species Report to inform the planning application for redevelopment of the land at 199 – 203 Henley Road and land to the rear of 205 – 207 Henley Road, Caversham, RG4 6LJ, hereafter referred to as the “Site”. This report accompanies a Preliminary Ecological Appraisal report issued by Ethos in April 2019. This document identified the potential for bats, badger, otter, bird, reptiles and hedgehog to be present on site, and includes the background data search records and results of previous ecological surveys on site which were carried out in 2016.

1.1 Aims and objectives

The overall assessment has been informed by guidelines provided in the ‘*CIEEM guidelines for ecological report writing 2nd Edition*, 2017’. Further guidance in relation to surveys for protected species is detailed in the relevant sections within this report. The primary aims of the ecological assessment is to provide a robust evaluation of the potential impacts of the proposed scheme on ecological features that may be affected; with due regard to relevant local planning policy and legislation.

The objectives of the protected species assessment were to:

- to identify if protected species are using the site;
- to identify any potential impacts from the development on protected species;
- to recommend a mitigation/compensation plan, which will ensure that no negative ecological impacts ensue from development of the proposed site;
- to identify ecological enhancement opportunities in relation to protected species; and
- to establish any requirements for further ecological surveys or monitoring

1.2 Site Location

The Site was located to the south of Henley Road in Caversham in Berkshire (central grid reference: SU 73014 75214). The Site was bordered by Henley Road to the north, by other residential dwellings and gardens to the west and east, and by a brook and farmland to the south. The wider environment was dominated by urban development with residential dwellings, gardens and roads to the west and a number of connected waterbodies, Caversham Lakes, and farmland to the east. The location of the Site in relation to the surrounding area is shown in Figure 1.

1.3 Development proposals

The development proposals (figure 2) include the demolition of existing structures and construction of a care home (Class C2), communal and ancillary facilities, associated parking and landscaping. The majority of the habitats in the centre of the site are proposed for removal, however, the boundary hedgerows are to be retained. A wildlife buffer will be created along the southern site boundary, incorporating areas of long grassland, fruit trees and enhancing a retained pond.

Figure 1: Site Location

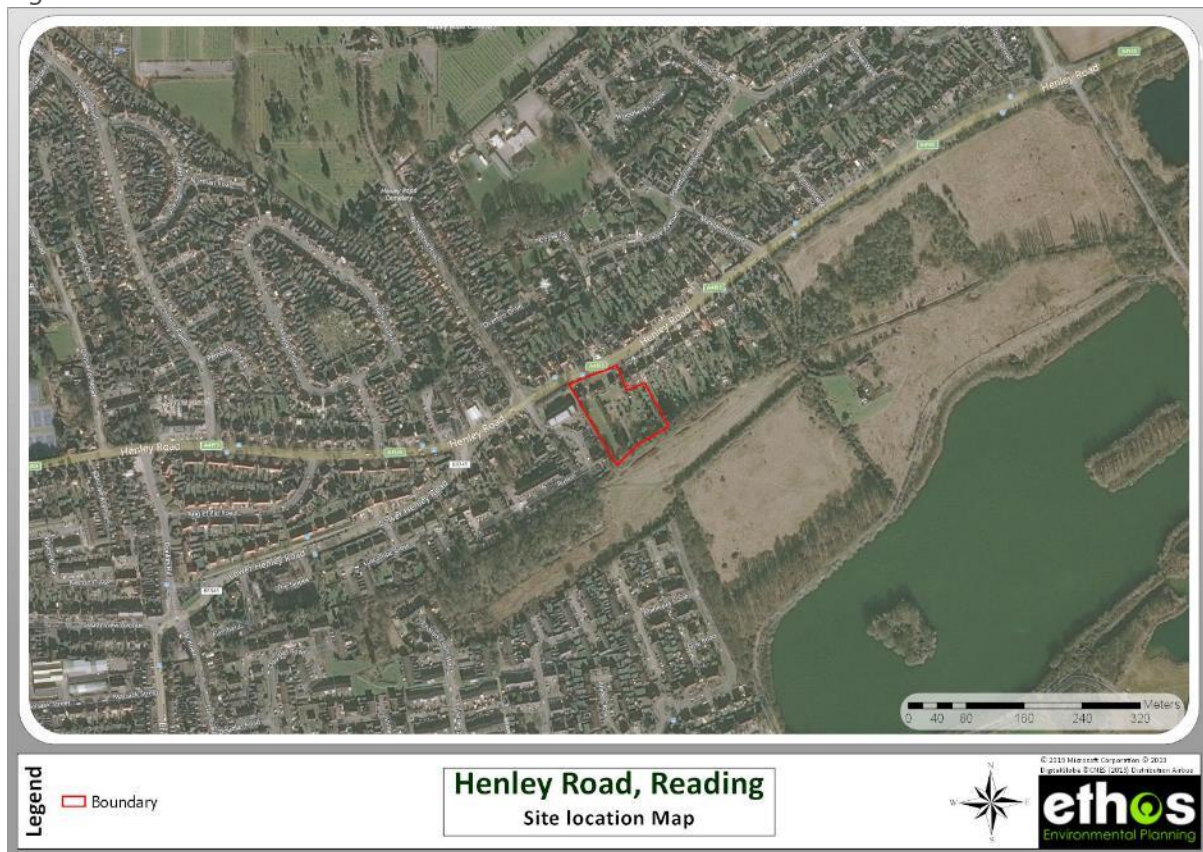


Figure 2: Development proposals



1.4 Structure of Report

The following sections are included within this report:

- Legislative and planning context;
- Methodology;
- Protected species assessment;
- Discussion; and
- Recommendations.

2.0 LEGISLATIVE AND POLICY CONTEXT

This section provides a summary of the legislative and planning context which has been used to inform the ecological assessment and subsequent recommendations made in this report. Appendix 1 sets out further details in relation to the most relevant legislation and policy.

2.1 Summary of Legislation

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all, the directive protects over 1,000 animals and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The habitats Directive and parts of the Birds Directive are transposed into legislation by the **Conservation of Habitat and Species Regulations 2017**. Further detail on legislation and designated sites is provided in appendix A1.2; with particular reference to the protection of Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

The **Natural Environment and Rural Communities Act 2006** (the NERC act) places a duty on all public authorities, including local planning authorities, to consider biodiversity in their work. Local planning authorities are to ensure that there is no net loss of biodiversity on a site, no net loss in habitat connectivity and aims to enhance biodiversity.

Specific legislation related to bat and breeding birds is outlined in Appendix 1, A1.1.

2.2 Policy

The 2012 National Planning Policy Framework has been updated and replaced with NPPF 2018 (as amended February 2019). This consolidates proposals from various Government consultation documents in recent years.

2.2.1 National Planning Policy Framework 2018 (As amended February 2019)

The NPPF 2018 (as amended February 2019) sets out principles for conserving and enhancing the local environment. Key policies are that local plans should allocate land with least environmental or amenity value and take a strategic approach to maintaining and strengthening networks of habitats and green infrastructure.

The approach to dealing with biodiversity in the context of planning applications is set out

at Paragraph 175 (NPPF):

‘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 reasons 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.*

2.2.2 Local Policy

The “Adopted Core Strategy Document” was produced by Reading Borough Council in January 2008 and revised January 2015. The following policies have been considered to be of particular relevance to the site:

CS36: Biodiversity and Geology

- A) Development should retain, protect and incorporate features of biodiversity or geological interest (including protected species and their habitats) found within the application site into their schemes.

On sites with recognised biodiversity or geological value, development will not be permitted where there would be a direct or indirect adverse impact on the site, unless it can be clearly demonstrated that: -

- i. The need for development clearly outweighs the need to protect the value of the site; and
- ii. Appropriate compensation, impact minimisation, mitigation and compensation are provided.

- B) Local Nature Reserves and Wildlife Heritage Sites will be safeguarded and where possible, enhanced. Permission will not be granted for any development that would adversely affect a designated nature reserve or Wildlife Heritage Site.

- C) Any development that would sever or threaten the integrity of an established wildlife link, as indicated on an adopted proposals map, will not be permitted. Where applicable, developments should be designed to protect, consolidate, extend and enhance the network of wildlife links and corridors in and adjoining the Borough, working with neighbouring authorities where appropriate.

CS38: Trees, Hedges and Woodlands

Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal, and the Borough's vegetation cover will be extended.

3.0 METHODOLOGY

3.1 Background data search

Background data search results were detailed in the Preliminary Ecological Appraisal (Ethos, 2019) and were used to determine the necessity for targeted protected species surveys. A brief summary of the background records and previous assessment data is made in section 4.1 to help contextualise the protected species survey results.

3.2 Bats

The methodology for the bat survey has been informed by the Bat Conservation Trust *Bat Surveys Good Practice Guidelines 2016*. The habitats on site were assessed for their suitability for foraging and commuting bats and the potential for roosting bats. The 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.

3.2.1 Structures assessment

The PEA recommended that an internal inspection of structures 201 and 203 be carried out as access into the loft voids was not possible during the survey carried out by Ethos in February 2019.

Physical internal inspection of the structures 201 and 203 was undertaken on 4th July 2019 by the surveyors using the equipment described below to assist the inspection. A CLU-10 (1 million candlepower) searchlight fitted with a red filter was used to search dark areas for signs of bats. Pentax 0.5m Papilio (8.5x21) close focusing binoculars were used to view areas inaccessible on foot. A telescopic inspection mirror was used to look on top of or into structures features with limited visual access for evidence of bats. A Rigid Sea-snake C-350 with micro camera head and extension cord endoscope was also used within the loft voids to search within gaps in the loft structure. Approximately one hour of search effort were expended.

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.

3.2.2 Emergence survey

The three main residential structures assessed as having high potential within the PEA were all subject to three emergent/ re-entry surveys on the dates shown in table 1 below;

Table 1: Survey dates

No. 199	No. 201	No. 203
23.05.19 Dawn re-entry	29.05.19 Dusk emergence	22.05.19 Dusk emergence
19.06.19 Dusk emergence	19.06.19 Dusk emergence	19.06.19 Dusk emergence
01.08.19 Dusk emergence	04.07.19 Dusk emergence	18.07.19 Dawn re-entry

The surveys included two surveyors positioned to cover northern and southern aspects of each structure, focusing on features with potential for roosting bats. Dusk surveys commenced fifteen minutes before sunset and finished 1.5 hours after sunset. Dawn surveys commenced 1.5 hours prior to sunrise and finished 15 minutes after sunrise.

The bat detectors used during the survey were all Echo Meter Touch Pro, recorded through the Echo Meter Touch application. All calls recorded were uploaded and analysed using Kaleidoscope software. All calls recorded were cross referenced to a call reference collection library of known bat species to confirm species presence.

3.2.3 Static Surveys

Passive bat detector surveys were used to identify levels of bat activity on the Site, as recommended in BCT Survey Guidelines. Passive bat detectors can provide a greater understanding of the bat species using the Site and identify patterns in bat activity over long periods of time.

Five Wildlife Acoustics Song Meter 4 (SM4) passive bat detectors were deployed in suitable locations on site (figure 3). This provided a comprehensive species assemblage for the site as well as an overview of bat activity across the site and highlighted areas of high activity. All calls recorded were analysed using Kaleidoscope Software and were compared to a library of known bat calls. The dates and locations of the static monitoring are detailed in table 2 and figure 3 below:

Table 2 Bat static dates

Static ref / location	Date deployed	Date collected	Survey nights
1, orchard, just north of southern boundary	16 th May 2019	28 th May 2019	13
2, hedge 4 in centre of site	22 nd May 2019	29 th May 2019	7
3, loft of building 203	4 th July 2019	24 th July 2019	20
4, hedge 4 in centre of site	4 th Sep 2019	10 th Sep 2019	7
5, orchard, just north of southern boundary	4 th Sep 2019	10 th Sep 2019	7

Figure 3: Static locations

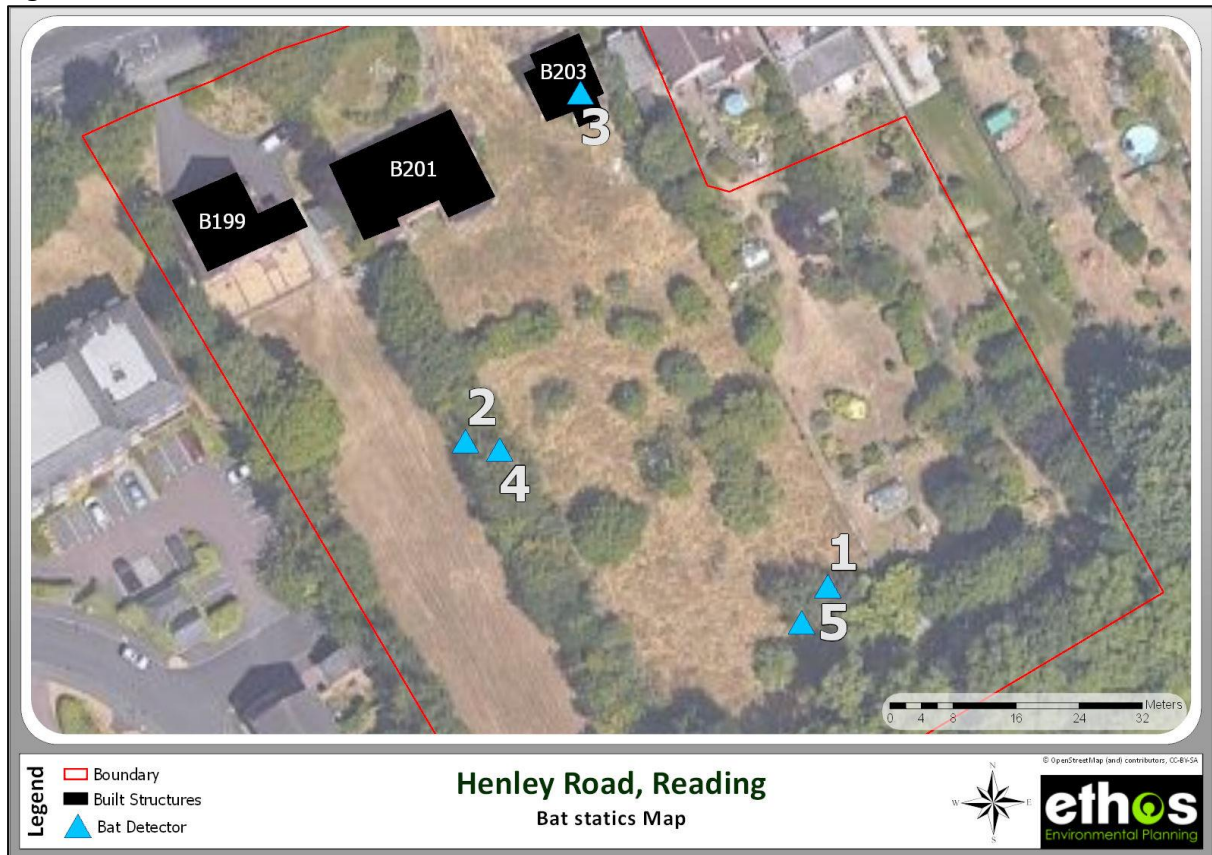


Figure 4 Hedgerow map



3.2.4 Elevated tree assessment

The preliminary ecological appraisal identified three trees on site as having roosting potential for bats. An elevated tree roost inspection was undertaken on 4th September 2019 inspecting all other potential roosting features (PRFs) not visible from the ground which may be used by bats. All PRFs will be identified, marked, recorded, mapped and described.

The close inspection comprised a detailed visual and olfactory investigation of the potential roosting feature (PRF) for; bats, field signs of bats, bat fly cases, and the suitability of the PRF. Data recorded during the inspection includes entrance dimensions, internal dimensions, apex shape, internal environment (humidity, texture, cleanliness, competitor occupancy, odour). Equipment included: Rigid micro CA-350 Inspection Camera with micro 6mm extension, camera, laser measure, and binoculars.

Figure 5 Tree survey for bats



3.3 Reptiles

The survey methodology for this assessment was informed by the Froglife Advice Sheet 10 – Surveying for Reptiles. 26 refugia were positioned in suitable habitat on site, focusing on the grassland fringes and scrub. The site was 1.04ha in size, meaning the number of deployed mats greatly exceeds the maximum refugia rate in Froglife (5 – 10 per ha). A search of natural refugia and basking areas was also undertaken during site surveys. Surveys were targeted to areas most likely to contain reptile habitats and to those areas that may be disturbed as part of the scheme and (to maximize the encounters with reptiles) 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 reptile mats were deployed on site on 16th May 2019 and were checked on eight separate occasions between May and September 2019:

- 22nd May 2019
- 2nd July 2019
- 18th July 2019
- 22nd July 2019
- 26th July 2019
- 30th July 2019
- 12th August 2019
- 10th September 2019

3.4 Otter

A detailed otter (*Lutra lutra*) survey was undertaken across the study area on 8th February, 2nd July and 4th September 2019. The surveys involved searching along the water course (Berry Brook) along the accessible frontage at the southern site boundary for signs of otter activity. In addition, suitable habitats within the vicinity of the brook were also searched for evidence of otters.

Survey methodology was informed by similar techniques used for national otter survey of Wales 2002 only a 100m section was searched upstream and 100m searched downstream from a fixed starting point. Also used to inform the survey methods was English Nature's advice sheet Monitoring the Otter, Conserving Natura 2000 Rivers Monitoring Series No. 10. Principal field signs for otter are:

- Holts - underground shelters, often found under tree roots, in rock piles, earth banks, and can be located within existing structures such as badger setts, rabbit burrows, fox earths. 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.
Spraints can be placed in one of three categories: old, recent or fresh. This provides some indication of the level and most recent occurrence of activity.
- Tracks - otter tracks (typically footprints) are highly distinctive and diagnostic and clearly differentiated from mink tracks by both size and shape.

3.5 Badger

All mammals holes on site will be subject to camera trap monitoring to establish species present and the status of any badger sett. Camera traps will be deployed to cover a 2 week period to view the holes on site. Data will be analysed for any evidence of badger to aid assessment and classification of the sett. The date, times and type of behavior will be noted.

As a guide to classifying each sett the following criteria is followed:

- **Main** – normally the focal sett for a badger social group. Generally always occupied, main setts usually have several well used holes with radiating tracks, latrines and other signs of activity. The actual number of holes can vary greatly, depending on social group size and soil conditions. Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
- **Annex** – a secondary sett, close to the main sett. Will normally be connected to the sett with very obvious tracks. Annexes may not be occupied constantly, even when the main sett is very active. Normally less than 150m from main sett, comprising several holes.
- **Subsidiary** – occurring at a greater distance from the main sett, and not as clearly linked to it as an annex. These setts will clearly fall within the territory of a social group and may be seasonally used by badgers; and
- **Outlier** – less frequently used, these setts may be colonised by other species when not in use by badgers. Outliers may represent a temporary sett, or a habitation for migrating individuals, or those excluded from a social group.

It is important to classify each sett and determine its use by the social group. This involves counting the number of entrances per sett and assessing sett use based on the following criteria:

- **Well-used:** being clear of any debris or vegetation, obviously in regular use and may or may not have been excavated recently;
- **Partially-used:** not in regular use and have debris such as leaves and twigs in the entrance or have moss and/or other plants growing in or around the entrance. Partially-used holes could be in regular use after a minimal amount of clearance; and
- **Disused:** not been in use for some time, are partially or completely blocked and could not be used without considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Two camera traps were deployed at the site from 4th -10th September 2019 to determine the status of the two mammal holes.

3.6 Personnel

The survey was led by Rachel Fayers who was assisted by Charlie Fayers, Martin Smith, Matt Attrill, George Clutterbuck and Kane Burchill. Full details are included within table 1 below. The survey team have worked together on numerous similar projects and have a complimentary range of skills and experience which are considered to have provided a robust ecological appraisal of the site.

Table 1 **Surveyors**

Ecologist	Position	Qualification/Licences	Experience
Rachel Fayers	Principal Ecologist	BSc (Hons), ACIEEM Class 2 Bat Licence (NE) Class 1 GCN Licence (NE)	Rachel is a practised ecologist and conservationist with over 7 years' experience in the field and is a licensed bat and GCN worker. Rachel is responsible for managing ecology surveys, appraisals and projects through various stages of planning and implementation.
Charlie Fayers	Principal Ecologist	BSc (Hons), ACIEEM Class 2 Bat Licence (NE) Class 1 GCN Licence (NE)	Charlie is a practising ecologist with 7 years' experience in biological fieldwork and is a licensed bat worker. Charlie is responsible for managing ecology surveys, appraisals and projects through various stages of planning and implementation.
Martin Smith	Ecologist	BSc (Hons), Grad CIEEM Class 2 Bat Licence (NE) Class 1 dormouse licence (NE)	Martin has over three years' experience in ecological field survey and consultancy. Martin is responsible for undertaking comprehensive habitat assessments, protected species surveys and is a licensed bat worker.
Matt Attrill	Ecologist	BSc (Hons), Grad CIEEM Class 2 Bat Licence Class 1 GCN Licence	Matt is a highly experienced field surveyor with over 6 years ecological experience. Matt is competent in surveying for a wide variety of wildlife gained experience from both the commercial and voluntary sectors. He is currently working towards further species licenses.
Joel Moore	Assistant Ecologist	BA (Hons) Working towards master's in applied Ecology Gloucestershire University	Has over two years' experience in ecological field survey and consultancy
Kane Burchill	Ecologist	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 Class 1 Bat Licence (NE)	Kane has over four years' experience in ecological field survey and consultancy. As an assistant Ecologist with Ethos; Kane is responsible for undertaking comprehensive habitat assessments and protected species surveys.
George Clutterbuck	Environmental Consultant	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 four years' experience in ecological field survey and consultancy. George works as Environmental Consultant for Ethos, assisting habitat and protected species surveys

3.7 Limitations

During the internal inspection of structure 203, it was not possible to gain access fully inside the loft void, due to the very small loft hatch. However, it was possible to view within the loft with a torch and survey the area immediately adjacent to the loft hatch. To compensate for the lack of access to the remainder of the loft void, a static bat detector was deployed in the loft for 20 days in order to further determine whether bats were using the loft space. This survey, in addition to the three emergence surveys was considered sufficient to determining the need for a protected species license from Natural England.

The bat emergence surveys identified Daubenton's bats roosting in Building 201. Myotis bats are known to be difficult to identify by their echolocation calls and eDNA analysis of droppings or trapping can be used to confirm species identification. In this survey, there were no droppings within the loft space of Building 201, and so eDNA analysis was not possible. In addition, trapping was not undertaken due to the bat's emergence points being in different places during the different surveys so it would have been very difficult to catch any emerging bats. Considering the invasiveness of trapping surveys, it was assessed that a detailed analysis of the echolocation calls would be sufficient and proportional to the low numbers of roosting bats. The echolocation calls were very clear, and Daubenton's bats are one of the more distinctive Myotis species. Overall, it was assessed that the survey techniques were proportional to the assessment and were sufficient to inform the need for a protected species license.

Bat Survey Guidelines (2016) recommend that for a building with 'high potential'. Three emergence surveys should be carried out, consisting of a minimum of one dawn survey and two dusk surveys. For structure 201, the programmed dawn survey had poor weather and the decision was made to change to a third dusk survey instead. Dawn surveys are particularly useful for larger roosts when trying to confirm the exact roosting location, and this was not an issue for this structure. It was considered that the lack of a dawn survey was not a significant limitation to the assessment.

The reptile survey was comprised of eight checks. Although the Froglife guidance recommends at least 20 visits to assess population size, it also notes that this '*depends on the objective of the survey, the size of the site and the size of the reptile population*'. For this site, the number of visits was deemed a proportional survey effort considering its relatively small size, the significant increase in refugia numbers deployed and the relatively low numbers observed in the presence/absence surveys. Furthermore, Ethos carried out 15 reptile checks at the site during 2016 and whilst those surveys are out of date, the results are still relevant to the assessment. Overall, it was assessed that sufficient survey effort was undertaken in order to determine a proportionate level of mitigation and compensation measures.

4.0 PROTECTED SPECIES ASSESSMENT

4.1 Summary of Previous Assessment:

Ecology Assessment, Land south of Henley Road, Reading, September 2016 (revised Feb 2017)

- The ecology assessment undertaken in 2016 identified moderate levels of bird activity across the site, with the majority of activity recorded in the hedgerows;
- Two mammal holes were observed at the site; one beneath a shed in the centre of the site and the other in a compost heap in the south-western corner of the site. Further camera trap monitoring however found no mammals to be using the hole throughout the duration of the surveys;
- There were four ponds identified onsite which all scored “poor” or below average” on the HSI assessment. Overall the site was assessed as having negligible potential for GCN;
- Reptile mats were deployed around the site on 20th July 2016 and a presence/absence survey undertaken on 15 occasions between 23rd August – 12th October 2016. The reptile surveys found low numbers of two reptile species – slow worm (*Anguis fragilis*) and grass snake (*Natrix natrix*).
- The tree inspection identified three trees on site with potential for bats;
- Subsequent emergent surveys identified tree 85 was an occasional day roost for a single common pipistrelle (*Pipistrellus pipistrellus*);
- The bat surveys confirmed that the three main residential dwellings (199, 201 and 203) were all used by roosting bats;
- Bat activity was spread over the site, with the highest concentrations along the western hedgerow, to the south of the main residential dwellings;

4.2 Bat survey

4.2.1 Environmental variables

Table 3 Environmental Variables

Variable	22/05/19		23/05/19		29/05/19		19/06/19		04/07/19		18/07/19		01/08/19	
Sunset/ Sunrise	20:59		05:02		21:06		21:25		21:23		05:09		20:38	
Time	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
	20:45	22:30	03:30	05:05	20:46	22:36	21:15	22:35	21:01	22:53	03:39	05:25	20:26	22:52
Temperature (°C)	15.3	11.9	6.7	8.7	13.5	10.3	18.7	17.3	23.8	14.9	12.4	7	17.5	14
Relative Humidity (%)	62	75	98.4	99.4	94.5	96.8	82.5	85	47.1	84.7	81	73	66.7	70
Cloud Coverage (oktas)	0	0	3	4	3	5	8	8	1	1	0	0	4	5
Precipitation	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Average Wind (mph)	0.5	1.1	0.3	0	0.2	0.4	0.1	0.0	1.2	0.9	0.7	0	0.6	1.3

4.2.2 Emergence/Re-entry Surveys

Three residential structures (numbers 199, 201, and 203) were each subject to three emergence/re-entry surveys. The key results are summarised below, along with photos showing the emergence location. Full survey results can be found in Appendix 2.

4.2.2.1 No. 199

Five Soprano pipistrelle (*Pipistrellus pygmaeus*) bats were observed emerging from building 199 during one survey, from three separate roost locations (as shown on photos 1 and 2). No other species were recorded emerging and no bats were recorded emerging or re-entering the structure during the other two surveys.



Photo 1: Location of Emerging bats at 21:20 and 21:32



Photo 2: Location of Emerging bat at 21:23

4.2.2.2 No. 201

- Three species of bat were observed emerging from the structure: a maximum from of two CP, three Daub and two BLE were observed emerging from the structure;
- Daub were observed
- High levels of commuting and foraging activity were noted within the garden and along the western hedgerow.



Photo 3: Location of emerging common pipistrelle at 21:38



Photo 4: Location of emerging Daub bat at 22:08



Photo 5: Location of Emerging BLE and Daub

4.2.2.3 No. 203

A single SP was observed emerging from the structure on one occasion. Activity around this structure was notably lower than elsewhere on site.



Photo 6: Location of Emerging SP at 21:44

Figure 6 Summary of bat roosting and commuting activity on site.



4.2.3 Activity Survey

Moderate - high levels of bat activity were recorded by surveyors during the emergence surveys, with the highest concentrations along hedgerow 4 where bats were observed commuting from north to south during the emergence surveys and back south to north during the dawn surveys. Up to 30 common pipistrelles and 15 soprano pipistrelles were observed following this commuting route. During the activity surveys the following species were recorded foraging at the site: common pipistrelle, soprano pipistrelle, Daubenton's, brown long-eared, noctule, serotine (*Eptesicus serotinus*) and Nathusius' pipistrelle. The key areas of activity were the southern boundary where all three pipistrelle species were observed foraging adjacent to the Berry Brook. Brown long-eared bats were observed foraging around the fruit trees in the orchard and other activity was generally spread across the site with common and soprano pipistrelles foraging along the western boundary hedgerow (hedge 2).

4.2.4 Static Monitoring

Full results of the static monitoring are detailed in appendix 2 and a summary is provided below:

The static bat detectors deployed at the site resulted in records for the following species:

-Common pipistrelle (*Pipistrellus pipistrellus*),

- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Nathusius pipistrelle,
- Noctule,
- Leislars
- Serotine (*Eptesicus serotinus*),
- Daubtentons
- Brown long-eared
- Myotis

Moderate levels of bat activity was recorded at the site through static detectors. The species assemblage was in line with the other bat surveys at the site with the most frequent bat recorded being pipistrelle species. Social calls from pipistrelle species were recorded during September.

4.2.5 Elevated Tree Inspection for Bats

Full results are shown in appendix 2 and a summary is provided below:

- Horse Chestnut (T85) was subject to an aerial inspection to further investigate potential roosting features not accessible from the ground. T85 had previously been subject to many pruning cuts high within the canopy which had resulted in damage to the tree. The most frequent PRF within the tree was pruning cuts, but as these were frequently opening upwards and hollowing into the tree, these did not offer much suitability to be used by bats.
- Two woodpecker holes were investigated on T85 and both had a strong bat smell from the holes. Given the experience of surveyors (2x class 2 bat license holders) the strong smell of bat confirms the feature as a bat roost.
- T85 is to be retained within the proposals.

4.3 Reptiles

The preliminary appraisal and Phase 1 habitat survey identified potential habitat for reptiles in the scrub edges and the semi-improved grassland beneath the traditional orchard. Subsequently, a series of reptile checks were carried out at the site and the results are shown in table 2 below.

Table 4: Reptiles Survey Results

Survey No.	Date/Time	Environmental conditions	Results
1	22/05/2019	16.9°C, 3/8 cloud, 0 mph avg. wind, 0.4 max wind, 52% relative humidity, dry	Juvenile grass snake
2	02/07/2019	18°C, 3/8 cloud, 1.2 mph avg. wind, 2mph max wind, 74% relative humidity, dry.	Vole Spp.
3	18/07/2019	16°C, 5/8 cloud, 2.1 mph avg. wind, 3.25 mph max wind, 48% relative humidity, dry.	No reptiles

4	22/07/2019	18°C, 0/8 cloud, 8 mph avg. wind, 9.1 mph max wind, 57% relative humidity, dry.	2 juvenile grass snakes
5	26/07/2019	17°C, 7/8 cloud, 0 mph avg. wind, 0mph max wind, 69% relative humidity, dry.	Adult grass snake
6	30/07/2019	15°C, 4/8 cloud, 7 mph avg. wind, 12mph max wind, 71% relative humidity, dry.	1 adult grass snake
7	12/08/2019	17°C, 4/8 cloud, 4 mph avg. wind, 6mph max wind, 67% relative humidity, dry.	Adult grass snake
8	10/09/2019	14°C, 2/8 cloud, 1 mph avg. wind, 3mph max wind, 78% relative humidity, dry.	2 juvenile grass snakes

A maximum of one adult grass snake was found on any one survey and the site contains a low population of a single common reptile species.

4.4 Otter

A search along the banks of the Berry Brook in February, July and September 2019 did not yield any evidence of otter. Whilst a mammal hole was observed along the Berry Brook in February 2019, further examination showed that it was not a proper hole, it was just an excavation beneath a broken section of shed. It was therefore assessed that otter do not actively use the site. As the suitable habitat for otter (the Berry Brook and the vegetative buffer of this feature along the south of the site), are proposed for retention and enhancement within the proposals, it was assessed that otters are not considered further in this report.

4.5 Badgers

The badger survey found that one active outlier sett on site, located along the southern site boundary. The hole was first observed to be active with signs of fresh digging on 4th September 2019. Camera trap surveys revealed that the sett was occasionally-used and a maximum of one badger was recorded at any one time.

Evidence of badger (*Meles meles*) foraging (in the form of mammal trails and snuffle holes) was found across the southern half of the site, especially around the fruit trees.

Two other mammal holes were previously observed during surveys, shown as target notes



Photo 5: badger on 5th Sept 2019



Photo 6: Badger on 6th Sept 2019

Figure 7 Badger survey results



5.0 DISCUSSION

5.1 Bats

The development proposals for the site include the demolition of all built structures and the removal of majority of the vegetation within the centre of the site. The bat emergence surveys on site identified structures 199, 201 and 203 as bat roosts as shown in figure 8 and summarised below:

Table 5 Summary of bat emergence

Building reference	Species	Number of bats	Roost type	Roost location
199	Soprano pipistrelle	5	Occasional day roost or small numbers of non-breeding bats	Three exit locations across building on southern and eastern elevations
201	Common pipistrelle	2	Day roost of small numbers of non-breeding bats	Southern elevation under window barge board
	Daubenton's	3	Day roost of small numbers of non-breeding bats	Eastern elevation under tiles
	Brown long-eared	2	Occasional day roost of small numbers of non-breeding bats	Southern elevation from loose tiles
203	Soprano pipistrelle	1	Occasional day roost of individual bats	Soffit level on northern elevation

The following conclusions were drawn from the surveys:

- The numbers of bats emerging/entering the structures varied on each survey which indicated that bats used the buildings on a transitional basis;
- The Daubenton's bat roost in Building 201 was assessed as being of County Significance under Wray Et Al guidance. (table 6)
- The common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle and brown long-eared roosts across buildings 199, 201 and 203 were assessed as being of District, Local or Parish level (see table 6);
- The roost statuses for structures 199 and 203 were assessed as being of 'low conservation value', as shown in figure 9 (on figure 4 of the Bat Mitigation Guidelines). The roost status for structure 201 was assessed as being 'low-moderate conservation value';
- Overall, it was assessed that the most proportional mitigation for the site would be: "provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements". This is shown on figure 9.

The development proposals include the demolition of all the built structures on site. Therefore, a European Protected Species licence will be required from Natural England in order to demolish structure 199, 201 and 203. Mitigation measures will include timing constraints, a precautionary working method statement and a pre-works check. Compensation measures will be included with roost features created within proposed dwellings and in retained trees at the southern boundary.

The bat surveys undertaken on site identified hedge 4 as a key commuting feature in regard to bats. Bats were observed commuting along this feature which connected the south of the site, where majority of foraging activity was recorded, to the roosts located towards the north of the site. Hedge 4 is scheduled to be removed in the development proposals which will

result in the loss of a commuting route both for roosting bats on site, and bats to the north of the site which were observed commuting south, likely to foraging over the lakes south of the site. As the compensatory roost features will be located at the southern boundary, this will negate the need for a strong commuting route for the on-site bats. To mitigate the impacts on the offsite bats to the north of the site, the western hedgerow (hedge 2) will be retained and enhanced. A lighting plan will be required to demonstrate that this retained commuting feature can be kept as a dark corridor. Recommendations are made in section 6.

Figure 8 Summary of bat roosting and commuting activity on site.



Table 6 Summary of importance of roosts and foraging features (Wray et al)

Location:		England					
Type and Complexity of linear Features:		Well-grown and well-connected hedgerows, small field sizes					
Foraging habitat characteristics:		Isolated woodland patches, less intensive arable and/or small towns and villages					
Species	Rarity	No. bats	Roost Type	Nearby Roosts	Geographic Frame of Reference		
					Roost	Commuting	Foraging

Daubenton's	Rarer	Small numbers of bats	Small numbers of non-breeding bats	Moderate number / not known	County	County (21)	County (21)
Common pipistrelle	Common	Individual bats	Individual bats	Moderate number / not known	District, Local or Parish	District, local or parish (15)	District, local or parish (12)
Soprano pipistrelle	Common	Individual bats	Small numbers of non-breeding bats	Moderate number / not known	District, Local or Parish	District, local or parish (20)	District, local or parish (19)
Brown long-eared	Common	Individual bats	Individual bats	Moderate number / not known	District, Local or Parish	District, local or parish (15)	District, local or parish (14)

Figure 9 bat mitigation table

	Roost status	Mitigation/compensation requirement (depending on impact)
Low	Feeding perches of common/rarer species	Flexibility over provision of bat-boxes, access to new buildings etc. No conditions about timing or monitoring
	Individual bats of common species	
	Small numbers of common species. Not a maternity site	
	Feeding perches of Annex II species	
	Small numbers of rarer species. Not a maternity site	
Conservation significance	Hibernation sites for small numbers of common/rarer species	Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements
	Maternity sites of common species	
	Maternity sites of rarer species	Timing constraints. More or less like-for-like replacement. Bats not to be left without a roost and must be given time to find the replacement. Monitoring for 2 years preferred.
	Significant hibernation sites for rarer/rarest species or all species assemblages	
	Sites meeting SSSI guidelines	Timing constraints. Like-for-like replacement as a minimum. No destruction of former roost until replacement completed and usage demonstrated. Monitoring for at least 2 years.
	Maternity sites of rarest species	
	High	

Figure 4. Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.

199 roost status ○
201 roost status ○
203 roost status ○
Overall requirement ○

5.2 Reptiles

The reptile surveys found low numbers of a single reptile species - grass snake (*Natrix natrix*). The snakes were observed in the semi-improved grassland and around the orchard. The

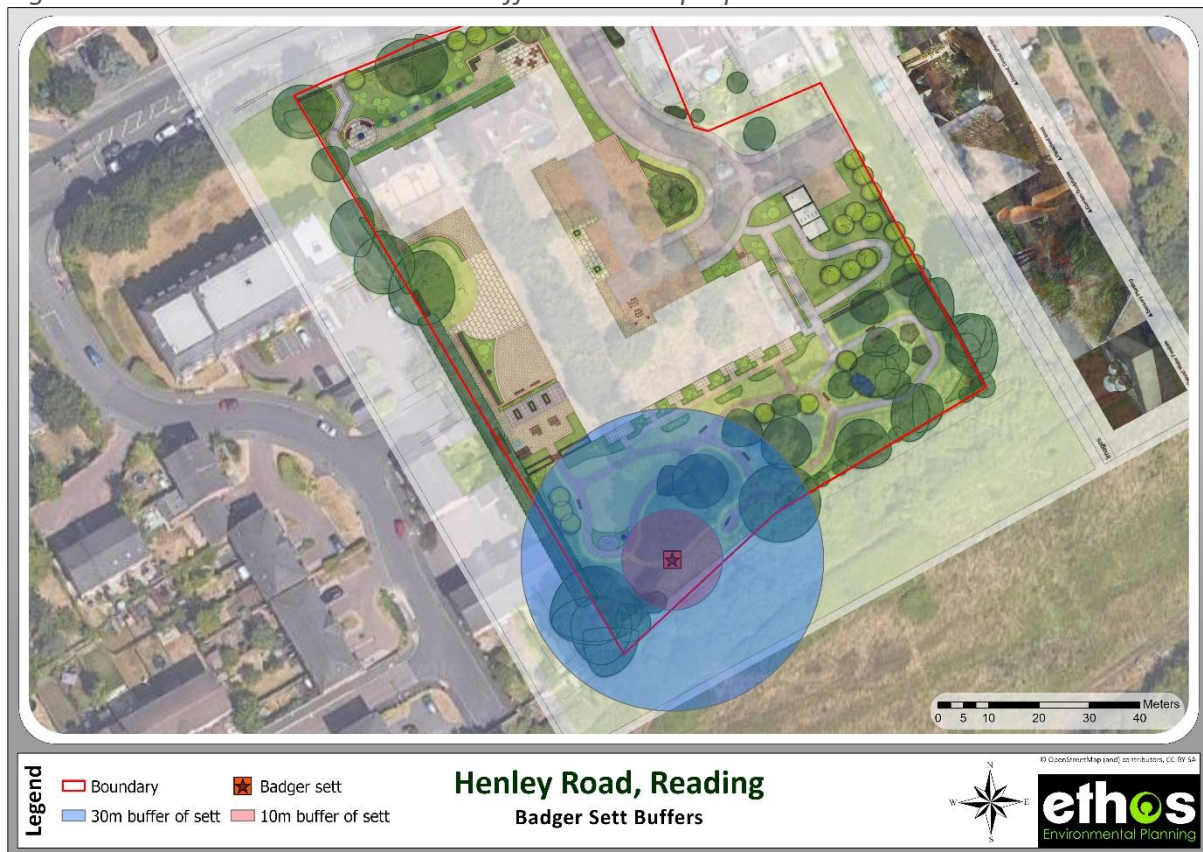
remainder of the habitats on site were assessed as having low to negligible value for reptiles. Given the low population size present, it was assessed that a translocation exercise would not be proportional. In order to ensure that reptiles are not injured or killed during the development, recommendations will be made for habitat manipulation to encourage them to autonomously relocate towards the southern site boundary, where habitat enhancements will be made to create a wildlife buffer area.

5.3 Badger

The surveys found one active outlier badger (*Meles meles*) sett located at the southern site boundary. This comprised of a single hole with evidence of fresh digging and videos showed a maximum of one individual at any one time using the sett. The hole was first observed in 2016 surveys, but was inactive throughout the whole survey period. Similarly, the hole was observed to still be inactive throughout the 2019 surveys until signs of use were observed on 4th September 2019. Therefore, it was not a long-established sett. The other mammal holes on site were found to be inactive and not used by badgers. The active outlier sett can be retained within development proposals as it is located in the southern boundary. The closest major construction works will be 29metres north of the sett entrance and will not impact the sett.

No works are proposed within the 10metres buffer; however, some footpaths will be created for residents within 15metres of the sett entrance. It was assessed that through the use of hand tools, these minor works would not impact badgers in their outlier sett. Furthermore, the direction of the tunnel was running to the south – further away from the site and construction area, therefore, it is highly unlikely that the tunnel would extend past the 10metre buffer.

Figure 10: Outlier sett location with buffers and site proposals



The development proposals will result in the loss of much of the semi-improved grassland on site and the orchard, which was likely to be used by foraging badgers. This will result in a net loss of badger foraging habitat although provisions have been made to enhance the retained habitat to enable badgers to continue to forage at the site. There is ample suitable habitat for badgers immediately to the south of the site, and it was assessed that overall the development of the site will not have a significant negative impact on badgers at a local level.

Mitigation measures will be required in order to protect the badger sett during construction activities and site clearance. Recommendations are included in section 6. Also included are recommendations to protect foraging and commuting badgers during construction activities.

6.0 RECOMMENDATIONS

This section makes recommendations for mitigation, compensation and enhancement measures for ecology on the site. The key measures are detailed below:

6.1 Habitats

The development proposals include the retention of the boundary hedgerows, but the removal of the majority of vegetation in the centre of the site which includes a species-rich hedgerow, two ponds, short sections of species-poor hedgerows, introduced shrub, amenity grassland, and part of the semi-improved grassland and traditional orchard.

6.1.1 Wildlife buffer

The vegetation at the south of the site will be retained and enhanced to create a wildlife buffer and this will compensate for the loss of the habitats cleared during development of the site. The following recommendations are made in relation to the wildlife buffer:

- To compensate for the loss of the section of Orchard (which is a BAP habitat), 10 fruit trees will be planted in the wildlife buffer. These will include a range of apple, plum and pear;
- Selected vegetation removed during site clearance will be retained on site and used to create habitat piles in the wildlife buffer;
- The existing hedgerow will be enhanced with the planting of native species such as hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), rowan (*Sorbus aucuparia*) and English elm (*Ulmus procera*). This will enhance the site for a wide range of faunal species;
- Grassland areas will be sown with a species-rich seed mixture such as Emorsgate Seeds EM3 – Special General Purpose Meadow Mixture. This contains a wide range of herb and grass species which would provide foraging habitat to a range of invertebrates;
- The wildlife buffer area should be separated from the construction site by hedges fencing to ensure its protection. The area should not be used to store construction materials or vehicles.

6.1.2 General habitat recommendations

- All proposed areas of amenity grassland (areas of open space and residential gardens) should be sown with Emorsgate Seeds EL1. This contains a range of slow growing grasses with a few wildflower species that both respond well to regular mowing and have value for butterflies and other pollinators; and,
- Proposed trees planted as part of the street scene should comprise locally native species. Suitable species include silver birch (*Betula pendula*) and rowan (*Sorbus aucuparia*) as they do not grow too large yet provide foraging habitat for a range of bird species.

6.2 Protected Species

6.2.1 Birds

- It is recommended that these areas are cleared outside of the bird nesting season (March to August inclusive) or else be subject to a pre-works check by a trained ecologist;
- Six bird boxes will be installed at the site to compensate for the temporary loss of nesting habitat. These should be of a style suitable for blue tits/great tits and robins/wrens (see figure 12);
- The retained southern boundary will be enhanced with the planting of native species.

9.2.2 Bats

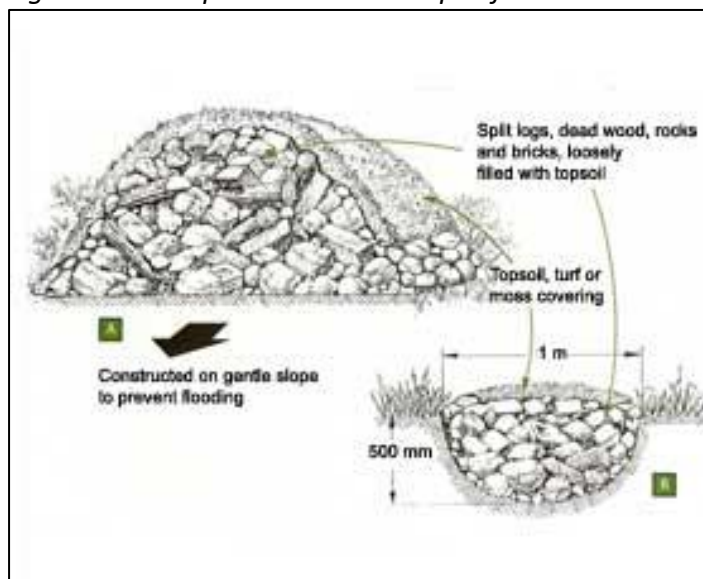
- A European Protected Species (EPS) license from Natural England will be required for demolition of the residential dwellings (199, 201 and 203) once planning permission has been granted;
- The current development proposals show the retention of Tree 1 (T85 within tree report), which was a confirmed transitional roost for common pipistrelle bats in the surveys undertaken 2016. If the development seeks the removal of this tree, a license will be required from Natural England prior to its removal;
- 10 replacement roosts capable of supporting pipistrelle, brown long-eared and Daubenton's bats will be erected around the site to provide a suitable range of environmental conditions and enhanced potential for roosting-shifting within the site boundary. The following three designs should be included within the site plan as shown on figure 12:
 - Two free-standing four-chamber bat house (can be custom-built or purchased). To be erected amongst vegetation along southern boundary;
 - Four Schwegler 2F bat boxes will be installed into mature trees on the western and southern boundary; and,
 - Four bat bricks (such as the Ibstock bat brick C) will be included in the southern elevation of the care home facing out onto the southern boundaries to further enhance the site by creating roosting opportunities for individual and small groups of bats;
- Before any works commencing, the retained bat expert will brief any site contractors on the presence of bat species, the legal implications of their presence and the appropriate procedures and control measures to be put in place;
- A pre-commencement bat survey will be made by the retained bat expert 24 hours before works commence. If any bats are encountered works will immediately stop and the bat expert will consult with the authorities. The bat expert will attempt to rescue torpid bats, hold them in accordance with the Bat Workers Manual and relocate them to the replacement bat roost boxes on site;
- Any gaps in the timbers, which have been recorded as clear of bats, will be plugged using clean rolls of newspaper into the holes which will remain in place during the soft stripping operations should this be required;

- The existing residential dwellings must be demolished during the bat inactive season (October – April inclusive). Prior to demolition the building must be inspected by a licensed bat worker (see section 2.4);
- All replacement roosts not due to be built into the fabric of the new structures will be installed prior to demolition commencing.
- An external lighting plan will be agreed with the Local Planning Authority. This should ensure that there is no excessive external lighting of the proposed roost entrances. Where required, light shielding/ hooding and restrictions shall be utilised to preserve darkened flight corridors to the principal bat mitigation features commuting routes and foraging areas.
- Planting of native vegetation on site (section 6.1) will help to enhance the site for bats foraging and provide linear corridors of movement through the site.

9.2.3 Reptiles

- All vegetation within the proposed construction site footprint will be strimmed down to 15 cm height during the reptile active season (Apr – Sep). Habitat clearance should begin at the north of the site and progress towards the south;
- Following a 24-hour period, the vegetation should then be cut down to the ground, and maintained low until commencement of construction;
- The wildlife buffer in the south of the site (see figure 5) will be managed to create a mosaic of grass, scrub and thicket habitats providing high-quality habitat for reptiles on site.
- Two reptile hibernacula will be created in the wildlife buffer as shown in the figure 11 below. The receptor site will also be subject to ongoing management to ensure its suitability for reptiles (see management below).

Figure 11 Reptile hibernacula specifications



Legend

- Free standing bat box
- Schweglar 2F bat box
- Bat Brick
- Swallow House martin / house sparrow box
- Blue/Great tit/Wren Robin) Box
- Hibernacula

9.2.4 Hedgehogs and Badgers

- Any excavations or trenches created during construction should either be covered at night time, or include ramps to allow animals to escape if they would fall in;
- Any external lighting used during construction should be switched off at night time to prevent disturbance to nocturnal animals; and
- Any proposed fencing should make use of permeable features that allow animals such as hedgehogs free movement around the site.
- Setts protection:
 - The outlier sett at the site may negatively impacted through the proximity of the footpath at the south of the site, the following recommendations are made to reduce the level of potential disturbance to this outlier sett.
 - The footpath should be re-routed to ensure a 10m buffer from the sett entrance.
 - Further protection of the sett can be created through careful soft landscaping features to be installed between the footpath and the sett entrance.
 - Footpath construction will be undertaken using lightweight machines and hand tools for any excavation works.
 - Site contractors will be briefed in a toolbox talk on the presence of a badger sett, location of the sett and legal implications of its presence.

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<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

APPENDIX 1 LEGISLATION AND POLICY DETAILS

A1.1 Legislation - Species

This section outlines the key legislation related to the habitats and species considered within this survey report.

A1.1.1 Bats

All British bats are fully protected under Section 9 Schedule 5 of the Wildlife and Countryside Act 1981 and amendments. Agreement, and are fully protected under The Conservation of Habitats and Species Regulations 2017. In addition, they are protected under the Berne Convention; they are given migratory species protection within the Bonn Convention. Regulation 43 (1) of The Conservation of Habitats and Species Regulation 2017 makes it an offence to:

- deliberately capture, injure or kill any species of bat;
- deliberately disturb any species of bat;
- damage or destroy a breeding site or resting place of any species of bat.

It is an offence to disturb any bat roosting site, whether the bats are there or not. Under Regulations 43 (2) disturbance includes in particular any disturbance which is likely:

- To impair their ability
 - to survive, to breed or reproduce, or to rear or nurture their young; or
 - in the case of a hibernating or migratory species, to hibernate or migrate; or
- To affect significantly the local distribution or abundance of the species to which they belong.

Presence of bats does not necessarily mean that development cannot go ahead, but that with suitable, approved mitigation, exemptions can be granted from the protection afforded to bats under regulation 43 by means of a licence. Natural England (NE) is the appropriate authority for determining licence applications for works associated with developments affecting bats, including demolition of their roost sites. In cases where licences are required, certain conditions have to be met to satisfy Natural England. Before the Statutory Nature Conservation Organisation (SNCO), in this case NE, can issue a licence to permit otherwise prohibited acts three tests have to be satisfied under the requirement of Regulation 55. These are:

1. Imperative Reasons of Overriding Public Interest [Reg 55(2)(e)];
2. No Satisfactory Alternative [Reg 55(9)(a)];
3. Maintenance of Favourable Conservation Status [Reg 55(9)(b)].

In order to meet the tests, SNCO usually expects the planning position to be fully resolved as this is necessary to satisfy tests 1 and 2. Full planning permission, if applicable, will need to have been granted and any conditions relating to bats fully discharged. ahead of any licence application to the SNCO. The LPA have a legal duty under The Conservation of Habitats and Species Regulations 2017, to assess whether the application is likely to meet the Three Tests

and therefore the requirements for Natural England licensing, prior to determination of an application The Licence application process may take two months before a licence is issued. Planning Permission and granting of a bat licence are separate legal functions. Therefore receiving planning permission from the Local Authority is no guarantee that the SNCO will issue a derogation licence.

A1.1.2 Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended) and cannot be killed or taken, their nests and eggs taken, damaged or destroyed while their nest is in use or being built. It also prohibits or controls certain methods of killing or taking except under licence. Other activities that are prohibited include possession and sale. Activities such as killing or taking birds (including relocating) which would otherwise be illegal can be carried out under licence where there is suitable justification and the issue cannot be resolved by alternative means.

Specially protected or Schedule 1 birds receive full protection under the Wildlife and Countryside Act 1981 (as amended). Part I birds are protected at all times, Part II during the close season only. In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

Appendix 2 Bat static analysis

The SM4 static bat detectors recorded the following bat calls:

Table 7: Static 1- 16th – 28th May 2019

Bat Species	No. recordings	Records / night	First recording	Maximum	Minimum	Mean
Common pipistrelle	503	71.8571429	21:23:00	89	46	71.5
Soprano pipistrelle	678	96.8571429	21:05:59	129	40	90.57142857
Nathusius's pipistrelle	95	13.5714286	21:53:48	26	1	13.14285714
Noctule	326	46.5714286	20:58:44	77	23	45.71428571
Daubenton's	105	15	21:48:44	21	2	13
Brown long-eared	1	0.14285714	23:00:27	1	0	0.142857143

Table 8: Static 2- 22nd – 29th May 2019

Bat Species	No. recordings	Records / night	First recording	Maximum	Minimum	Mean
Common pipistrelle	807	67.25	21:02:04	84	34	65.72727273
Soprano pipistrelle	1476	123	21:04:31	148	68	122.83333333
Nathusius's pipistrelle	74	6.16666667	21:43:03	15	0	6.166666667
Noctule	342	28.5	20:59:20	58	2	28.5
Leisler's	2	0.16666667	01:14:39	1	0	0.166666667
Serotine	4	0.33333333	21:56:07	1	0	0.333333333
Whiskered/Brandt's	29	2.41666667	21:28:11	5	0	2.416666667
Daubenton's	348	29	21:31:42	38	11	29
Brown long-eared	1	0.08333333	00:22:45	1	0	0.083333333

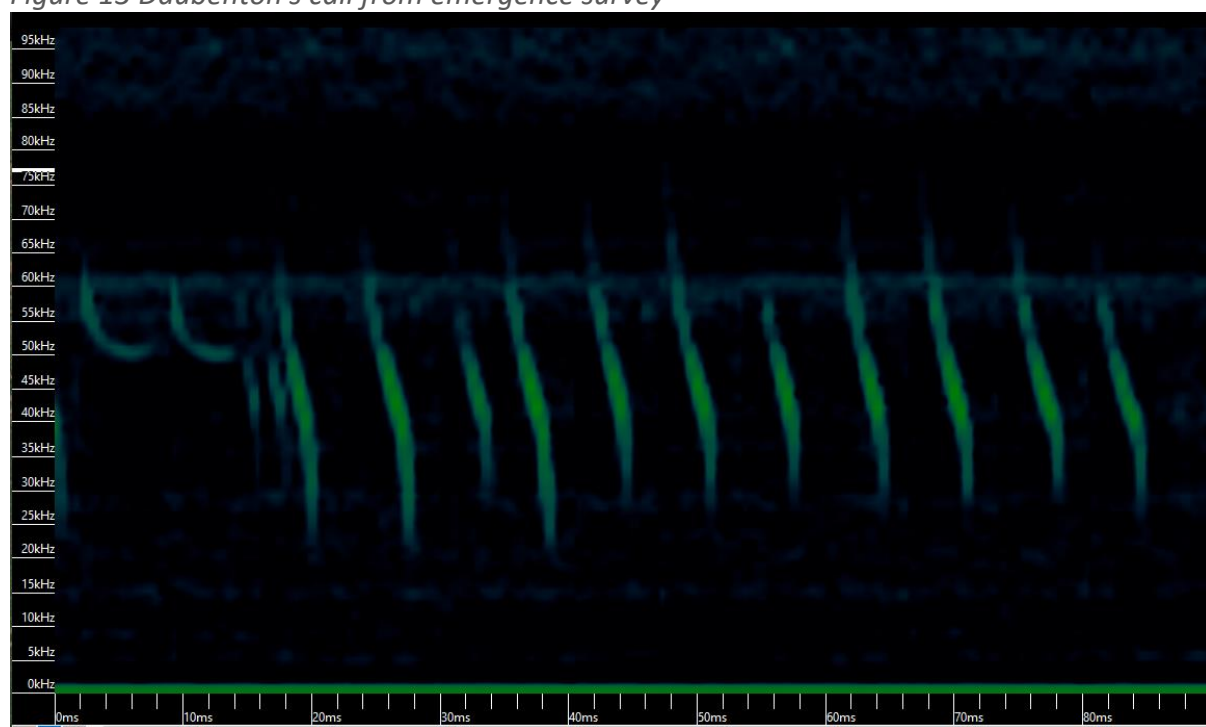
Table 9 Static 4, 4-10th September 2019

Code	Bat Species	No. recordings	Records / night	First recording	Maximum	Minimum	Mean
PIPPIP	Common pipistrelle	111	18.5	20:00:08	37	8	18.5
PIPPYG	Soprano pipistrelle	379	63.16666667	19:44:55	109	29	62
PIP NAT	Nathusius's pipistrelle	1	0.16666667	04:16:26	1	0	0.166666667
NYC NOC	Noctule	246	41	19:33:41	69	3	39
NYC LEI	Leisler's	4	0.66666667	21:32:36	4	0	0.666666667
EPTSER							
MYOBRA							
MYONAT							
MYODAU	Daubenton's	123	20.5	20:01:14	30	12	20
MYOBEC							
PLEAUR	Brown long-eared	19	3.16666667	20:50:33	6	0	2.5
RHIHIP							
RHIFER							
BARBAR							

Table 10 Static 5, 4-10th September 2019

Code	Bat Species	No. recordings	Records / night	First recording	Maximum	Minimum	Mean
PIPPIP	Common pipistrelle	65	10.83333333	19:46:42	15	8	10.83333333
PIPPYG	Soprano pipistrelle	110	18.33333333	19:48:36	22	13	17.83333333
PIP NAT	Nathusius's pipistrelle	9	1.5	20:25:58	4	0	1.5
NYCNOC	Noctule	235	39.16666667	19:33:32	71	12	37.16666667
NYCLEI	Leisler's	1	0.16666667	05:14:15		0	0
EPTSER							
MYOBRA							
MYONAT							
MYODAU	Daubenton's	18	3	20:25:06	5	1	2.833333333
MYOBEC							
PLEAUR							
RHIHIP							
RHIFER							
BARBAR							

Figure 13 Daubenton's call from emergence survey



Bat Emergence surveys

Building 199

23/05/2019 Dawn

- High levels of bat activity was recorded on site, including approx. 30 common pipistrelle and 15 soprano pipistrelle bats observed commuting south to north along central western hedgerow;

- Other species recorded included Daubenton's and noctule bats;
- No bats were observed entering or emerging from structure 199 throughout the duration of the survey.

19/06/2019 Dusk

- 20:20: Two soprano pipistrelle bats emerged from the southern gable end before commuting south along hedgerow 4;
- 20:23: A third SP bat emerged from a loose tile on the eastern pitch of the roof;
- 21:32: two SP bats emerged from the western pitch of the roof before commuting south.
- Other activity recorded included commuting noctules and a single Daubenton's bat foraging within the garden of 199.



Photo 7: Location of Emerging bats at 21:20 and 21:32



Photo 8: Location of Emerging bat at 21:23

01/08/2019 Dusk

- No bats were observed emerging from the structure during the survey;
- First bat recorded was a soprano pipistrelle (*Pipistrellus pygmaeus*) at 21:08;
- Other activity recorded included foraging and commuting common and soprano pipistrelle (*Pipistrellus pygmaeus*) bats as well as commuting brown long-eared bats and Daubenton's which were observed commuting north to south down hedgerow 4.

Building 201

29/05/2019 Dusk

- First bat recorded was a commuting noctule at 21:26 (20 mins after sunset);
- 21:38 Common pipistrelle bat emerged from Eastern dormer before commuting along western hedgerow;
- 22:08 Daubenton's bat emerged from eastern pitch of structure before commuting south along hedgerow 4;
- Other activity recorded on site included foraging and commuting; *Myotis spp.*, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and Daubenton's bat.



Photo 9: Location of Emerging common pipistrelle at 21:38



Photo 10: Location of Emerging Daub at 22:08

19/06/2019 dusk

- First bat recorded was a noctule commuting (11 mins after sunset);
- Two CP emerged from Western elevation at 21: 48 and 21:52;
- 21:12 three Daubenton's bats emerged from western elevation;
- Two brown long-eared bats emerged from the western elevation at 22:14 and 22:19;
- Other activity included CP, Daub's, BLE's commuting along the western hedgerow with foraging taking place within the garden.



Photo 5: Location of Emerging BLE and Daubs

04/07/2019 dusk

- First bat recorded was an unidentified small bat commuting over the site at 21:46 +23 after sunset;
- High levels of foraging activity with CP, SP, Daub and BLE recorded on site;
- No bats were observed emerging from the built structure onsite.

Building 203

22/05/2019 Dusk

- First bat recorded was a commuting noctule at 21:15 (16 mins after sunset);

- 21:44 SP emerged from a loose tile on the northern pitch of the structure;
- Other activity on site included noctules foraging above site throughout the duration of the survey and CP's commuting north to south across the site;



Photo 6: Location of Emerging SP at 21:44

19/06/2019 Dusk

- First bat recorded was a commuting noctule at 21:37 (15 mins after sunset);
- Other activity including commuting and foraging CP and SP
- No bats were observed emerging from the built structure on site

18/07/2019 Dawn

- First bat recorded was a brown long eared bat at 03:41 –88mins before sunrise;
- Other activity included commuting and foraging CP, SP, Noc and Daubs;
- No bats were observed re – entering the built structure onsite.

Scoring system from Wray et al. used to determine the roost significance in the discussion, section 5.

Scoring system for valuing commuting and foraging bats using Wray et al

Geographic frame of reference	Score
International	>50
National	41 – 50
Regional	31 – 40
County	21 – 30
District/local/parish	11 – 20
Not important	1 - 10

Summary of valuing commuting routes for bats (Wray et al)

Species	Number of bats	Roosts/potential roosts nearby	Types and complexity of linear features
Common (2)	Individual bats (5)	None (1)	Absence of linear features (1)
-	-	Small number (3)	Unvegetated fences and large field sizes (2)

Rarer (5)	Small number of bats (10)	Moderate number/not known (4)	Walls, gappy or flailed hedgerows, isolated well-grown hedgerows and moderate field sizes (3)
-	-	Large number of roosts or close to SSSI (5)	Well-grown and well-connected hedgerows, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within SAC (20)	Complex network of mature well established hedgerows, small fields, river/streams nearby (5)

Summary of valuing foraging areas for bats (Wray et al)

Species	Number of bats	Roosts/potential roosts nearby	Types and complexity of linear features
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established vegetation (1)
-	-	Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Small number of bats (10)	Moderate number/not known (4)	Isolated woodland patches, less intensive arable and/or small towns/villages (3)
-	-	Large number of roosts or close to SSSI (5)	Larger or connected woodland blocks, mixed agriculture, and small villages/hamlets (4)
Rarest (20)	Large number of bats (20)	Close to or within SAC (20)	Mosaic of pasture and wetland areas (5)

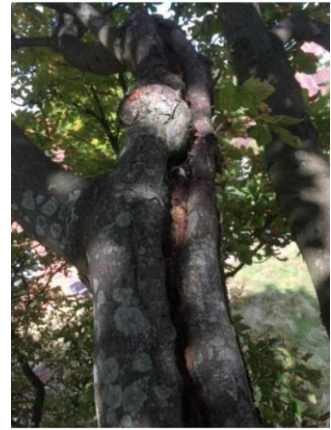
Ground level assessment results for onsite trees

Tree Reference	Tree Species	Tree category	Life stage	Tree height/diameter breast height	Features for bats	Suitability for roosting bats
T85	Horse chestnut	C1	Mature	19m/84cm	Woodpecker holes/multiple pruning cuts/historic tear outs/loose bark	High
T56	Apple	C1	Mature	6m/33cm	Hollow areas on main trunk	Low
T61	Crack willow	U	Late mature	24m/115cm	Subsistence cracks	Low
T62	Crack willow	U	Late mature	24m/85cm	Subsistence cracks	Low
T65	Crack willow	U	Late mature	24m/200cm	Subsistence cracks	Low
T70	Common beech	U	Mature	26m/110cm	Physiological condition fair, with signs of fungal decay	Negligible
T88	Common beech	B2	Mature	27m/92cm	Good condition tree with some light ivy cover	Low
T89	Common beech	B2	Mature	25m/51cm	Good condition tree with some light ivy cover	Low
T90	Common beech	B2	Mature	25m/53cm	Good condition tree with some light ivy cover	Low
T91	Common beech	B2	Mature	25/53cm	Good condition tree with some light ivy cover	Low

PRF number	PRF type	PRF height (m)	Further details	Suitability for roosting bats	Photo
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1	Woodpecker holes	2.9m	Two woodpecker holes on deadwood from previous tree works. Holes had strong smell of bats.	High/confirmed roost	
2	Pruning cut	9	Poor pruning cut resulted in tree damage.	Negligible	

3	Pruning cut	9	Poor pruning cut resulted in tree damage. Did not extend into the tree and opening was pointing upwards.	Negligible	
4	Pruning cut	9	Poor pruning cut resulted in tree damage	Negligible	

5	Pruning cut	8	Poor pruning cut resulted in tree damage.	Negligible	
6	Tear out/rams horns	9	Historic damage to tree resulted in this feature. Feature did not extend into limb and offered little protection for bats.	Low	

7	Pruning cut	9	Poor pruning cut resulted in tree damage	Negligible	
8	Pruning cut	9	Poor pruning cut resulted in tree damage	Negligible	

9	Pruning cut	9	Poor pruning cut resulted in tree damage	Negligible	
10	Pruning cut	9	Poor pruning cut resulted in tree damage	Negligible	

11	Lifted bark	7	Small area of lifted bark on limb of tree. Bark offered minor possible protection only and	Low	
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