



**EASTERGATE ECOLOGY
BAT SURVEY REPORT**

Prepared for Linden Homes

by

Hankinson Duckett Associates

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hankinson duckett associates

The Stables, Howbery Park, Benson Lane, Wallingford, Oxfordshire, OX10 8BA

Hankinson Duckett Associates Limited Registered in England & Wales 3462810 Registered Office: The Stables, Howbery Park, Benson Lane, Wallingford, OX10 8BA

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1 INTRODUCTION

1.1 Site location and summary description

1.1.1 This report describes a suite of bat surveys of approximately 11.5ha of land at Eastergate, West Sussex, hereinafter referred to as the site. The site centre is located by National Grid Reference SU 948055. The study was commissioned by Linden Homes in two phases in July and August 2013.

1.1.2 The site is located on the northern edge of Eastergate and is bordered to the south by Barnham Road with residential development beyond, to the east by a public footpath with farmland beyond and to the west by residential development fronting Fontwell Avenue and Collins Close. Unmanaged orchard and farmland extends to the north. The location and boundary of the site are shown in *Appendix A*.

1.1.3 In general terms, the site comprises a disused fruit farm characterised by areas of unmanaged orchard separated by managed species-poor semi-improved grassland fields and areas of species-poor semi-improved grassland/ scrub mosaic. Field boundaries within and around the site generally comprise fences with mature tree lines and a single stretch of species-poor hedgerow. A more detailed description of the habitats within the site is given in the Ecological Appraisal (HDA, 2013).

1.2 Legislative context

1.2.1 All UK bat species are protected under The Conservation of Habitats and Species Regulations 2010 (as amended), which implements the EC Habitats Directive 92/43/EEC in the United Kingdom. In relation to European Protected Species (EPS), the 2010 Regulations make it an offence to:

- Deliberately capture, injure or kill any wild animal of an EPS;
- Deliberately disturb wild animals of any such species, in particular any disturbance which is likely to: (i) impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or to hibernate or migrate; (ii) affect significantly the local distribution or abundance of the species to which they belong;
- Damage or destroy a breeding site or resting place of such an animal; and
- To (a) be in possession of, or to control; (b) to transport any live or dead animal or any part of an animal; (c) to sell or exchange or (d) offer for sale or exchange any live or dead animal or part of an animal of an EPS.

1.2.2 In addition, all UK bat species are protected under the Wildlife and Countryside Act 1981 (as amended). All species are listed on Schedule 5 of the Act and are subject to the provisions of Sections 9.4b and 9.4c, which make it an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection; or

- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a bat.

1.2.3 If works are planned that are likely to constitute an offence under the current legislation, an application for a licence should be made to Natural England.

1.2.4 Seven species of bat (Barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteinii*, Noctule *Nyctalus noctula*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Brown Long-eared, Greater Horseshoe *Rhinolophus ferrumequinum* and Lesser Horseshoe *Rhinolophus hipposideros*) are included as priority species on the UKBAP.

1.3 Development proposals

1.3.1 The site is proposed for residential development with associated infrastructure including public open space and surface water attenuation.

1.4 Scope and purpose of the report

1.4.1 The Ecological Appraisal of the site (HDA, 2013) identified habitats suitable for use by foraging and commuting bats. In addition, the presence of buildings and trees with the potential to contain features suitable for use by roosting and/or hibernating bats were noted.

1.4.2 In recognition of the proposed development of the site and its potential to be used by bats, and within the legislative context set out in *Section 1.2*, a suite of bat surveys was subsequently undertaken to inform bat presence and usage of the site and adjacent areas, and to determine the need for any licensing or mitigation in relation to bats. The surveys conducted to inform this assessment are described in *Section 2*.

1.4.3 Specifically, the aims of the study were:

- To identify potential bat roosts in structures and trees within the site, where affected by the proposed development;
- To determine levels of bat activity within the site, and identify species and approximate numbers;
- To provide an assessment of the importance of the site for foraging and/or commuting bats;
- To determine the requirement, if any, for licensing in respect of bats; and
- To provide outline recommendations for any mitigation and/or enhancement required to ensure that the development avoids adverse impacts on bats, and, where possible, provides enhancements to support the long-term favourable conservation status of bats in accordance with nature conservation legislation, planning policy and the 2006 NERC Act.

2 METHODOLOGY

2.1 Introduction

- 2.1.1 The methodology followed in relation to all bat survey work undertaken at the site, accords with current legislation and good practice guidelines set out by the Bat Conservation Trust (BCT, 2012). The following sections detail the suite of bat surveys undertaken to inform the potential development of the site.

2.2 Phase 1 bat survey

- 2.2.1 A Phase 1 bat survey was carried out by Alex Leishman of HDA on 30th July 2013. All buildings and trees within and immediately adjacent to the site were assessed for their potential to support roosting and/or hibernating bats and classified into categories according to their potential. The methodology for each has been outlined in the following sections.

Phase 1 building survey

- 2.2.2 Buildings were inspected externally to assess their suitability for occupancy by roosting and/or hibernating bats, and to locate any evidence of current or former bat roosts in the form of bats, droppings, staining, scratch marks, feeding signs and/or remains of bats. Internal inspections were not carried out due to health and safety concerns.
- 2.2.3 Externally, binoculars and a powerful torch were used to identify and investigate, from the ground, any potential entry and exit points such as missing roof tiles, loose fascias and lifted lead flashing, and to look for evidence of entry/exit in the form of staining, discolouration and/or scratch marks.
- 2.2.4 Built structures were classified as having 'high', 'moderate', 'low', 'very low' or 'negligible' potential to support roosting bats. Assessment of bat roosting potential requires consideration of a number of criteria including the design and construction of the building or structure, the size and location of potential features and access points, the position of the building or structure, aspect, surrounding habitat use and adjacent landscape linkages. A plan showing the results of the Phase 1 building survey is provided in *Appendix A*.

Phase 1 tree survey

- 2.2.5 All trees within and immediately adjacent to the site were inspected from ground-level, with the aid of binoculars and a powerful torch, to identify potential features suitable for use by roosting and/or hibernating bats. Potential features include splits, cracks, cavities, peeling bark, woodpecker holes, broken branches and a covering of Ivy *Hedera helix* where this is of a sufficient age to provide a suitable micro-climate between the tree and Ivy stem(s).
- 2.2.6 In accordance with current good practice guidelines (BCT, 2012), trees were categorised into one of five categories. Categorisation was based on the nature, size, location and quality of features present in each tree:

- confirmed bat roosts;
- trees with multiple, highly suitable features capable of supporting larger roosts (BCT Category 1*);
- trees with definite bat potential, supporting fewer suitable features than Category 1* trees or with potential for use by single bats (BCT Category 1);
- trees with no obvious potential although the tree is of size and age that elevated surveys may result in cracks or crevices being found, or the tree supports some features that have some limited potential to support bats (BCT Category 2); and
- trees with no potential to support bats (BCT Category 3).

2.2.7 The results of the Phase 1 bat survey of buildings and trees was used to determine the need for further bat surveys.

2.3 Phase 2 roost surveys

2.3.1 Phase 2 roost surveys, comprising dusk emergence surveys, were conducted wherever either: (i) buildings and trees to be affected by the proposed development contained evidence of current or former occupation by bats; or (ii) buildings and trees affected by the proposed development could not be exhaustively searched and had potential to support roosting bats. Times and dates of surveys are given in *Table 1* below, along with surveyors present and weather conditions.

Table 1: Time and dates of bat emergence surveys (2013)

Date	Start	Finish	Sunset / Sunset	Weather conditions	Surveyors	Building / Tree surveyed
23/08/13	19.50	22.10	20.08	22-18°C, dry, calm, overcast	AS, EP, TW	B1, B2
30/08/13	19.35	21.53	19.53	19°C, mostly dry (short downpour at end of survey), calm	TW, AS	T1, T10
26/09/13	18.40	21.00	18.56	16-8°C, dry, calm	EP, MB	T1, T10

Surveyor references: Anna Senior (AS), Elisabetta Pirodda (EP), Tony Wells (TW), Michael Berwick (MB)

2.3.2 The Phase 2 roost surveys of the buildings and trees affected by the proposed development comprised emergence surveys to determine presence/probable absence of bats and, where present, identify species and number present. The level of survey effort conducted was determined with reference to the bat roosting potential of each building and tree identified during the Phase 1 survey in accordance with best practice guidelines (BCT, 2012).

2.3.3 Surveyors with electronic bat detectors were positioned outside buildings/trees to record bats emerging from or entering the building/tree. Surveyors were positioned to provide adequate coverage of all potential emergence points on each building/tree surveyed. Dusk surveys generally began 15 minutes before sunset, ending approximately 2 hours after

sunset. Records were made of any emergencies and entries, and incidental records were also made of bat commuting and foraging activity in the vicinity of each surveyor.

2.4 Phase 2 bat activity survey

Bat activity transects

- 2.4.1 In order to provide an assessment of the importance of the site for foraging and commuting bats, dusk activity surveys were undertaken between July 2013 and May 2014. Bat surveyors carrying hand-held bat detectors walked transects of the site, with listening stops at regular intervals for periods of up to 5 minutes. Visual observations of bats and bat call registrations were noted, recording time, location, activity and, where known, species. Recordings of foraging and/or commuting activity made using digital devices were subsequently analysed to determine the identity of any unconfirmed species recorded during the surveys. Times and dates of surveys are given in *Table 2* below, along with surveyors present and weather conditions.

Table 2: Details of bat activity surveys (2013 & 2014)

Date	Sunset	Time	Surveyors	Weather conditions
23/07/13	21.03	20.45 – 23.05	AS, MB	19-17°C, dry, calm
16/08/13	20.22	20.05 – 22.22	AS, TW	18.5 - 18°C, heavy mist from 21.00 onwards, calm
26/09/13	18.56	18.40 – 21.00	AS	16-8°C, dry, calm
09/05/14	20.35	20.20 – 22.45	AM, MB	13-12°C, dry, breezy

Surveyor references: Anna Senior (AS), Adrian Meurer (AM), Tony Wells (TW), Michael Berwick (MB)

Automated surveys

- 2.4.2 Automated surveys were carried out as a supplement to the activity transect surveys and to gain further information on the species and activity frequency of bats at the site. A programmable electronic bat detector¹ was positioned in an open part of the site and left in place during the activity surveys on three occasions in August 2013. The detector was programmed to record all bat activity. Details of the times and dates of automated bat detector deployment are provided in *Table 3* below and the location of each detector deployed is shown in *Appendix C*.
- 2.4.3 The results of the dedicated bat activity surveys are further supported by additional records made during the dusk emergence surveys of the buildings and trees within the site. Together, these surveys allow a robust assessment of bat foraging and commuting activity throughout the site.

¹ Anabat SD2 with remote microphone and 'Analook' software

Table 3: Details of automated bat detector deployment (2013)

Location	Deployment date and times	Sunset/ Sunrise	Temp. Max. / Min.	Weather conditions
A	16.08.13 – 19.08.13	20.21 / 05.54	20°C / 9°C	Light breeze; dry.
B	23.08.13: 19.20 to 22.10	20.07	24°C / 15°C	Light breeze; dry.
C	30.08.13: 19.50 to 22.10	19.52	23°C / 12°C	Light breeze; dry.

2.5 Limitations of surveys

2.5.1 All surveys followed current best practice guidelines (BCT, 2012) and were conducted at an appropriate time of year and with an appropriate level of survey effort both in terms of the number of surveyors used and number of survey visits undertaken.

2.5.2 All emergence and activity surveys were generally carried out during suitable weather conditions. Although 'sub-optimal' weather conditions were experienced during the later stages of the bat emergence survey on 30/08/13 this was not considered a significant constraint as bats continued to be recorded throughout.

2.5.3 Due to vandalism of the bat recording equipment the automated survey carried out at location A failed to record. Following this incident, automated detectors were only left out on two occasions, whilst surveyors were on site undertaking other surveys. Whilst this limited the intended amount of automated data to be collected it is considered that the activity transect surveys and incidental records of bat activity made during the emergence surveys provide a good indication of the foraging and commuting activities of bats utilising the site.

2.5.4 With due regard to the above, it is considered that no significant constraints were encountered during the course of the surveys and it is considered that the surveys conducted are sufficient to allow a robust assessment of the potential effects of the proposed development on roosting and foraging/ commuting bats.

3 RESULTS

3.1 Desk study

3.1.1 The desk study conducted to inform the Ecological Appraisal (HDA, 2013) identified 17 bat records including Common Pipistrelle *Pipistrellus pipistrellus* and Brown Long-eared bat *Plecotus auritus* as well as undetermined species. The closest records to the site were of an individual undetermined pipistrelle bat, from a residential area of Eastergate approximately 100m south of the site.

3.2 Phase 1 building survey

3.2.1 All buildings within the site were inspected during the Phase 1 building survey. The results of the survey are summarised in *Table 4* below and the location of the buildings are shown in *Appendix A*.

Table 4: Summary of Phase 1 building scoping survey (2013)

Name (Ref no.)	Description	Findings	BCT Category
Barn (B1)	Brick barn with single pitched corrugated tin roof in good condition.	Gaps behind wooden fascia boards and hanging guttering provide potential roosting sites. No evidence of roosting bats recorded.	'Low' bat roosting potential
Chimney (B2)	An 8m tall brick built chimney, heavily clad in Ivy.	No obvious features but dense Ivy on chimney may be covering potential roost features. No evidence of roosting bats recorded.	'Low' bat roosting potential
Complex of farm buildings (B3-B5)	An assortment of three partially collapsed, derelict brick and corrugated iron barns and sheds that are becoming heavily overgrown with Bramble <i>Rubus fruticosus</i> and Ivy. The buildings are in a state of disrepair and the roofs have partially collapsed creating a light, cluttered (with vegetation), and draughty environment.	No suitable features or evidence of roosting bats recorded.	'Negligible' bat roosting potential
Brick Shed (B6)	A small brick built building located to the east of Buildings 1-5 within an area of dense scrub and trees. Tile roof with no sarking and Ivy growing throughout. The building has open windows and doors resulting in a draughty interior and it is completely surrounded by dense vegetation resulting in a very cluttered external environment.	No evidence of bats recorded. Building unsuitable for roosting bats.	'Negligible' bat roosting potential
Water Tower (B7)	A small water storage tank supported by a brick built base. No features for roosting bats identified.	No evidence of bats recorded. Building unsuitable for roosting bats.	'Negligible' bat roosting potential
Doctor's Surgery (B8)	A single-storey doctor's surgery building of fairly recent brick construction with a pitched tiled roof. The building is in a good state of repair.	No suitable features or evidence of roosting bats recorded.	'Very low' bat roosting potential

3.2.2 In summary, two buildings were identified as having potential to support roosting bats, namely the Barn (B1) and Chimney (B2). Emergence surveys were conducted on each of these buildings (see *Section 3.4*).

- 3.2.3 All other buildings within the site were considered to have negligible or very low potential to support roosting bats and were not subject to further survey and assessment.

3.3 Phase 1 tree survey

- 3.3.1 The Phase 1 tree survey identified a total of 13 trees with potential to support roosting bats within or adjacent to the site. Five of these were identified as Category 1 (i.e. trees displaying features with definite potential to support single roosting bats) and the remaining eight trees were considered to be Category 2 (i.e. trees not displaying obvious potential but with potential to contain concealed features, or trees displaying features with limited bat roosting potential).

- 3.3.2 The location of trees identified as having potential to support roosting bats are identified on the plan in *Appendix A* and are described in *Table 5* below. Numbers refer to the tree labels given on the plan.

Table 5: Summary of Phase 1 tree scoping survey (2013)

Tree Ref	Description	Findings	BCT Category
1	Mature Oak	Split branch on the southern aspect and a number of dead branches.	1
2	Mature Oak	No obvious features but of an age where features may be present.	2
3	Oak	No obvious features but of an age where features may be present and dense ivy on trunk may be covering potential roost features.	2
4	Multi stemmed Ash	No obvious features but of an age where features may be present.	2
5	Mature Oak with dense ivy covering. Located off site.	Split branches and dense ivy and epicormic growth on trunk may be covering potential roost features.	1
6	Mature Oak. Located off site.	Split branch on south-eastern aspect.	1
7	Mature Oak with dense ivy covering. Located off site.	No obvious features but dense ivy on trunk may be covering potential roost features.	2
8	Mature Ash with dense ivy covering. Located off site.	No obvious features but dense ivy on trunk may be covering potential roost features.	2
9	Mature Ash. Located off site.	Two woodpecker holes on the northern and western aspects. Split branches on the western aspect.	1
10	Mature Ash	Potential cavity in the tree trunk.	1
11	Apple	No obvious features but of an age where features may be present and dense ivy on trunk may be covering potential roost features.	2

Tree Ref	Description	Findings	BCT Category
12	Apple	No obvious features but of an age where features may be present and dense lvy on trunk may be covering potential roost features.	2
13	Apple	No obvious features but of an age where features may be present and dense lvy on trunk may be covering potential roost features.	2

3.3.3 All other trees within or adjacent to the proposed development were assessed as having negligible (Category 3) potential to support roosting bats. All trees with Category 1 or above potential to support roosting bats, and with the potential to be affected by development proposals, were subject to Phase 2 roost surveys in accordance with BCT guidelines (BCT, 2012).

3.4 Phase 2 roost surveys

3.4.1 Following the identification of buildings and trees with potential to support roosting bats within the site, all buildings with 'low' or above potential to support roosting bats and all Category 1 trees were subject to Phase 2 emergence surveys using up to three surveyors on any one occasion to ensure comprehensive coverage.

3.4.2 The results of the Phase 2 bat roost surveys are given in *Table 6* below.

Table 6: Results of Phase 2 building and tree surveys (2013)

Building / Tree Ref	Date / Type	Results	Updated Roost Status
Barn (B1)	Dusk – 23/08/2013	No bats emerged	No roosting bat activity recorded No bat roost expected
Chimney (B2)	Dusk – 23/08/2013	No bats emerged	No roosting bat activity recorded No bat roost expected
T1	Dusk – 30/08/2013	No bats emerged	No roosting bat activity recorded No bat roost expected
	Dusk – 26/09/2013	No bats emerged	
T10	Dusk – 30/08/2013	No bats emerged	No roosting bat activity recorded No bat roost expected
	Dusk – 26/09/2013	No bats emerged	

3.4.3 No roosts were identified within the surveyed buildings or trees during the Phase 2 emergence surveys.

3.5 Bat activity and automated surveys

3.5.1 The areas covered during the bat activity transects included all site boundaries, tree lines and unmanaged orchard and scrub edges within the site. The locations in which the automated bat detector were placed are shown on the plan in *Appendix C*.

3.5.2

A summary of bat activity recorded during the activity and automated surveys, along with additional data recorded during the emergence surveys, is provided on the plans in *Appendices B and C*. Levels of mapped activity (heavy, moderate, occasional, single pass) generally relate to the frequency of bat passes rather than the number of individuals observed. A summary of each species, their activity and an estimation of numbers is provided in *Table 7*. Together, these records provide a good indication of the importance of habitats across the site for foraging and commuting bats. In total, at least six species of bat were recorded during the surveys.

Table 7: Summary of bat species activity observed/recorded during all surveys (2013 & 2014)

Species	Activity Summary	Approx. number recorded*
Common Pipistrelle	Common Pipistrelle was the most frequently recorded species during the surveys. The peak areas of activity were along Barnham Road on the southern boundary of the site and along the footpath on the eastern boundary of the site. Other areas of frequent foraging were associated with the unmanaged orchard margins to the centre and south east of the site. Activity was less frequent in the field in the west of the site. Other treelines, unmanaged orchard edges and hedgerows within and on the boundaries of the site are likely to be used on at least an occasional basis by foraging or commuting Common Pipistrelle bats roosting in the local area. The automated detector revealed occasional use of location C by Common Pipistrelle bats and occasional passes at location B. It is expected that up to 5 Common Pipistrelle bats could have been using the site at any one time. The areas of activity would suggest that at least some of these bats are roosting within the urban area of Eastergate to the south.	5
Soprano Pipistrelle	Soprano Pipistrelle was the second most frequently recorded species during the surveys. The peak area of activity was along the boundary hedgerow adjacent to Barnham Road on the southern boundary of the site. Other areas of frequent foraging were associated with the unmanaged orchard edge to the south east of the site and along the treelines in the centre of the site. Activity was less frequent in the field to the west of the site. Other treelines, woodland edges and scrub within and on the boundaries of the site are likely to be used on at least an occasional basis by foraging or commuting Soprano Pipistrelle bats roosting in the local area. The automated detector revealed relatively frequent use of location C by Soprano Pipistrelle bats and occasional passes at location B. It is expected that up to 2 Soprano Pipistrelle bats could have been using the site at any one time.	2
Serotine	Serotine bat was recorded within the site on 5 occasions and registrations often involved a quick pass along a road, hedgerow or treeline. It is likely that the site is used by up to 1 Serotine bat at any one time as part of a much larger foraging range for individuals of this species.	1

Species	Activity Summary	Approx. number recorded*
Leisler's	Leisler bat was recorded on two occasions during the automated surveys across the site. It is likely that the site is used by up to 1 Leisler's bat at any one time as part of a much larger foraging range for individuals of this species.	1
Noctule	Noctule was recorded on just one occasion during the surveys and activity comprised a single pass across the centre of the site.	1
<i>Myotis</i> sp.	<i>Myotis</i> sp. bats were recorded infrequently across the site. <i>Myotis</i> species are notoriously difficult to distinguish by call alone, it is considered however that Natterer's and possibly Whiskered or Brandt's bats were recorded over the surveys. Peak areas of activity were associated with the footpath on the eastern boundary of the site and the cluster of buildings in the centre of the site. Most registrations involved brief passes by single <i>Myotis</i> bats although occasional foraging was recorded in the centre of the site, along the unmanaged orchard, scrub and tree boundaries. Subsequently it is expected that the site is used on an occasional basis by a low number of <i>Myotis</i> bats of up to 2 relatively common and widespread species. It is possible that the site was used by up to 1-2 <i>Myotis</i> bats at any one time during the surveys.	1-2

*This is an estimation of the number of bats of any one species/ group likely to have been using the site during any one visit.

3.5.3 Widespread foraging was recorded within the site by Common and Soprano Pipistrelle bats mostly around unmanaged orchard areas and site boundaries. Serotine, Leisler's, *Myotis* species and Noctule bats were recorded on a less frequent basis during the suite of bat surveys suggesting the site forms only a small part of a much wider foraging territory for individuals of these species. Bats were recorded foraging across the site within areas of unmanaged orchard, tree lines, hedgerows, scrub, grassland and buildings. Particular concentrations of activity were noted in the unmanaged orchard in the centre of the site, along Barnham Road on the southern boundary of the site and along the footpath on the eastern boundary of the site. Activity recorded during the bat surveys showed that the majority of the vegetated linear features and areas of mature trees within the site are used at least occasionally by foraging or commuting bats.

4 EVALUATION

4.1 Roosting bats

4.1.1 The Phase 1 bat scoping survey identified two structures within the site with 'low' potential to support roosting bats and two trees within the site with 'moderate' (BCT Category 1) or above potential to support roosting bats. A further six trees were identified as having 'low' (BCT Category 2) potential. Subsequently, in accordance with BCT guidance, emergence surveys of the two structures identified as having potential to support roosting bats and BCT Category 1 trees were undertaken in 2013. No confirmed roosts within trees or structures were identified during the suite of bat surveys, suggesting that the site is of negligible importance for roosting bats.

- 4.1.2 Notwithstanding the absence of roosting bats during the survey, bats may use roosts on a seasonal/ transitory basis with old roosts often abandoned and new roosts established. Precautionary measures to ensure that development works comply with nature conservation legislation and that roosting opportunities for bats are maintained at the site following development are therefore given in *Section 5* of this report.

4.2 Foraging and commuting bats

- 4.2.1 The bat surveys recorded at least six bat species using the site for foraging and commuting, with varying levels of activity observed throughout the surveys. The plans in *Appendices B* and *C* provide an overview of bat activity recorded during the surveys.
- 4.2.2 Common Pipistrelle was the species most commonly recorded. Concentrations of Common Pipistrelle activity were noted along the southern and eastern site boundaries. Soprano Pipistrelle activity was similarly distributed throughout the site but overall numbers were lower. The results suggest that up to 5 Common Pipistrelle and 2 Soprano Pipistrelle bats (but usually fewer) could have been foraging within the site at any one time. Serotine, Leisler's, Noctule and *Myotis* bats were recorded only briefly on a few occasions over the suite of surveys suggesting that the site only forms a very small part of a much wider foraging area for individuals of these species and is highly unlikely to be of significant value as a commuting route.
- 4.2.3 Despite the number of species recorded and the overall number of bats expected to have been present within the site at any one time, generally the level of activity recorded over the site was considered low relative to its size. Activity was generally limited to the site margins and interfaces between the grasslands and unmanaged orchards and scrub, hedgerows and tree lines. The site is considered to be of no higher than 'local' value for foraging and commuting bats.
- 4.2.4 Notwithstanding this, development proposals should seek to maintain and, where possible, enhance foraging or commuting opportunities for all species of bats using the site in accordance with nature conservation legislation, planning policy and the 2006 NERC Act. Recommendations to maintain and enhance the value of the site for bats are provided in *Section 5* below.

5 RECOMMENDATIONS

- 5.1 This section identifies any requirements for measures to be implemented during development of the site in order to avoid, mitigate and compensate potential effects of development on bats. In addition, measures for enhancement of the site for roosting and foraging bats are included in accordance with the NPPF (2012) and the NERC Act (2006).

5.2 Roosting habitat

5.2.1 Opportunities for roosting bats within the site are limited to:

- two structures identified as having low potential to support roosting bats (B1 and B2);
- one structure identified as having very low potential (B8);
- two trees identified as having Category 1 potential to support roosting bats; and
- six trees identified as having Category 2 potential to support roosting bats.

5.2.2 No active bat roosts were identified within the structures or trees subject to emergence surveys in 2013. It should be noted however that bats can change roosts frequently and individual features may be used sporadically or on a seasonal basis, with little or no sign of occupation outside of these times. Although it is unlikely that existing buildings can be retained within developed areas of the site, where possible trees containing features suitable for use by roosting and/or hibernating bats should be retained in order to maintain the current and future value of the area for bats. It is also recommended that the opportunities provided by retained trees are maintained through sensitive use of lighting and maintenance of connective habitat as described in *Section 5.3* below. Where significant loss of future roosting opportunities arises, this should be offset through alternative roost provision elsewhere within the site as discussed in *Sections 5.2.9* and *5.2.10* below.

Works to trees

5.2.3 In the event that retention of a tree identified as providing opportunities for roosting bats is not possible within the proposed development, due to the transitory nature with which bats may use roost sites in trees it is recommended that felling works should be carried out in accordance with the following procedure:

- 1) Trees suitable for climbing inspections should first be climbed by a licensed bat worker to inspect potential roost sites for bats. In the event that a bat is encountered, and the tree cannot be retained, then felling/ works to this tree should be delayed until an EPS licence has been sought and obtained from Natural England prior to soft felling in accordance with the methodology described under point 3 below. In the event that no bats are encountered during an exhaustive search then any features should be 'soft stopped' to prevent re-occupation prior to felling.
- 2) Trees with BCT Category 1, where an exhaustive climbed inspection is not possible, should be subject to an appropriate number of emergence/ re-entry surveys to confirm the absence of roosting bats prior to any works affecting the tree commencing (see *Section 5.2.8*).
- 3) BCT Category 2 trees that are unsuitable for climbing inspections should be 'soft felled' under the supervision of a suitably qualified ecologist. Soft felling involves progressive removal of the tree, using ropes to gently lower sections of tree potentially supporting

roosting bats to the ground for inspection by a suitably qualified ecologist. Where appropriate, features should be left on the ground overnight before clearing to allow any bats present to escape.

Works to buildings

5.2.4 Unless future surveys confirm the continued absence of roosting bats (see *Section 5.2.8*), demolition should be preceded by a 'destructive search'. This would involve the removal of any features suitable for roosting bats on buildings to be lost by hand under the supervision of a suitably qualified ecologist.

5.2.5 In the event that a roosting bat is discovered during any of the above works to buildings or trees, works must cease and Natural England be contacted to agree an appropriate course of action. A licence may need to be applied for, and approved, before works can continue.

Maintenance of roosting opportunities

5.2.6 The integrity of retained roosting opportunities within and adjacent to the site should be conserved through the maintenance of connections to commuting and foraging habitat and sensitive use of lighting throughout the construction and operational phases. In addition, trees not supporting roosting bats at the time of survey have potential to support bats in the future and therefore these trees should be retained and their ability to support roosting bats be maintained where possible to do so. Where significant loss of future roosting opportunities arises, this should be offset through alternative roost provision elsewhere within the site. Further measures to ensure that roosting opportunities provided by the site remain following development are given in *Sections 5.2.9* and *5.2.10* below.

5.2.7 It is recommended that all detailed external lighting proposals are reviewed at appropriate design stages by a suitably qualified ecologist.

Further Survey

5.2.8 Bats may occupy roost sites on a seasonal or temporary basis and old roost sites may be abandoned and new roosts occupied within relatively short periods of time. Where appropriate, bat survey work, including emergence and/ or climbing inspections of trees and buildings with potential to support roosting bats affected by the proposed development, should be updated in advance of development commencing. The guidance of a suitably qualified ecologist should be sought to determine if and when surveys should be updated with regard to the development programme. This would ensure that up-to-date information is available to inform the extent of any mitigation and licensing requirements relating to bats.

Enhancement of opportunities for roosting bats

5.2.9 Development of the site could provide opportunities to enhance the value of the site for roosting bats in accordance with NPPF (2012) and the NERC Act (2006) through the provision of a range of bat roosting features. The detailed design and location of such features should be determined at an appropriate stage prior to construction, but should include a selection of the following:

- Erection of bat boxes on mature trees across the site, particularly those with good connections to foraging habitat such as along the southern and eastern site boundaries and other areas of newly created and retained semi-natural habitats within and around the site; and
- Creation of roosting opportunities on new dwellings and other buildings, e.g. through inclusion of bat tubes or 'Habibat' type bat boxes within the external walls, access to roof voids etc.

5.2.10 By providing a variety of roosting opportunities in different locations and orientations, a range of roost spaces with varied microclimates could be provided by the site, offering opportunities for roosting bats throughout the year and maintaining the future potential of the site to support roosting bats. In the long-term, proposed new areas of landscape planting are also likely to provide an additional bat roosting resource as planted trees develop suitable bat roosting features such as cracks, splits and holes. This would further increase opportunities for roosting bats. Natural development of bat roosting features should be further encouraged by management of existing and retained woodland areas and the retention of mature trees and standing deadwood, where appropriate.

5.3 Foraging and commuting bats

5.3.1 Although the site is of limited value for foraging and commuting bats and other areas of suitable habitat are abundant in the surrounding area, development should seek to maintain opportunities at the site for foraging and commuting bats. This could be achieved through retention of boundary hedgerow and tree lines in addition to areas of scrub and orchard habitat. Where significant loss of foraging and commuting habitat is unavoidable, appropriate mitigation in the form of compensatory habitat creation and enhancement of retained habitats should be provided. This could be achieved through implementation of the following recommendations to maintain and enhance opportunities for foraging and commuting bats within and adjacent to the site following development:

- Retain and, where appropriate, enhance linear features within and around the site through planting of native tree and scrub species in order to maintain and reinforce the integrity of existing commuting corridors across and adjacent to the site.
- Where appropriate, create new linear features such as treelines and hedgerows to improve connectivity between areas of suitable roosting and foraging habitat within the site and the wider area to increase opportunities for commuting bats.

- Where appropriate, carry out landscape planting using native species within the interior of the site to improve the area for foraging bats. This might include shrub planting, creation of rough and meadow grassland areas, orchards and marginal vegetation and/or use of hedgerows and treelines along boundaries. Where appropriate, the landscape planting scheme should include pollen and nectar rich species in order to encourage invertebrate prey.
- The lighting strategy for the site should be designed to minimise light spill onto the site margins and identified areas of foraging and commuting habitat within the site, including hedgerows, treelines and scrub edges. Although some species including Pipistrelles and Noctule are tolerant of light, *Myotis* species are known to be very sensitive of artificial light. Lighting should therefore be at the minimum level required for safety and directional, cut-off and low-level lighting should be used as appropriate. The lighting proposals for the site should be reviewed at the detailed design stage by a suitably qualified ecologist.

6 CONCLUSION

- 6.1 The Phase 1 bat scoping survey identified a number of built structures and trees across the site with potential to support roosting bats. Subsequent Phase 2 emergence surveys carried out in accordance with BCT's 2012 guidelines found no bat roosts to be present. Notwithstanding this, development proposals should seek to maintain opportunities for roosting/hibernating bats within the site.
- 6.2 Where retention of trees and buildings with potential to support roosting bats is not possible, further surveys and/or 'soft felling' or 'destructive searches' will be required prior to removal in accordance with recommendations outlined in *Section 5*. Where significant loss of future roosting opportunities arises, this should be offset through alternative roost provision elsewhere within the site.
- 6.3 Although the site is considered, as a whole, to be of no higher than local value to foraging and commuting bats, at least six species of bat were recorded using the site and the site is likely to form a significant proportion of the foraging territory for a low number of Pipistrelle bats which are relatively common and widespread in the UK.
- 6.4 Wherever possible development proposals for the site should aim to maintain and enhance existing opportunities for foraging and commuting bats in order to support the long-term favourable conservation status of bats in accordance with nature conservation legislation, planning policy and the 2006 NERC Act. This can be achieved through the implementation of a sensitive lighting strategy to maintain the value of retained habitats in addition to the retention, enhancement and/ or creation of high quality foraging and commuting habitats (e.g. hedgerows, woodland, orchard, scrub, rough and meadow grassland and wetland),

and use of pollen and nectar rich species in landscape planting. Measures by which this can be achieved are given in *Section 5*.

- 6.5 In conclusion, subject to the implementation of the measures described in *Section 5* to avoid adverse effects on roosting, foraging and commuting bats currently using habitats within and adjacent to the site, it is considered unlikely that any adverse effects would arise as a result of the proposed development on the local bat population. Furthermore, development of the site would provide opportunity to enhance the value of the site for bats through provision of high quality foraging habitat and new roosting opportunities on buildings and trees in keeping with planning policy and the 2006 NERC Act.

7 REFERENCES

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HDA Document Control and Quality Assurance Record

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Project Reference: 2136.9
Document Title: Bat Survey Report
Commissioning Party: Linden Homes

Issue	Description	Date of Issue	Signed
1	Bat Survey Report	June 2014	AM

	Personnel	Position
Author	Clare Parker MCIEEM	Ecologist
Approved for issue	Adrian Meurer MCIEEM	Director

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APPENDIX A

Phase 1 Bat Survey Results Plan



KEY

Site boundary

Phase 1 Bat Survey

Buildings

'Low' bat roost potential (BCT, 2012)

'Negligible/low' ('very low') bat roost potential (BCT, 2012)

'Negligible' bat roost potential (BCT, 2012)

Trees

Category 1 trees (BCT, 2012)

Category 2 trees (BCT, 2012)

* All other trees and buildings within and immediately adjacent to the site are regarded as having negligible bat roost potential (Category 3). No high potential (Category 1*) trees were recorded.

CLIENT:
Linden Homes

PROJECT:
Eastergate Ecology

TITLE:
Phase 1 Bat Survey Results Plan

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Not to scale

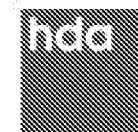
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t 01491 838175 e consult@hda-enviro.co.uk w www.hda-enviro.co.uk

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APPENDIX B

Phase 2 Emergence Survey Summary Plan



KEY

-  Site boundary
-  Building surveyed
-  Tree surveyed

No bat roosts identified.

Incidental foraging and commuting activity *

Common Pipistrelle

-  Moderate foraging activity

Soprano Pipistrelle

-  Moderate foraging activity

Myotis Sp.

-  Moderate foraging activity

Leisler

-  Single bat pass

Serotine

-  Single bat pass

Noctule

-  Single bat pass

* Incidental records of bat foraging and commuting activity made during the Phase 2 emergence surveys should be read in conjunction with the Phase 2 bat activity summary plan in Appendix C.

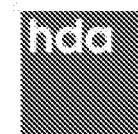
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Linden Homes
PROJECT:
Eastergate Ecology
TITLE:
Phase 2 Emergence Survey Summary Plan
SCALE AT A3:
Not to scale
DATE:
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APPENDIX C

Phase 2 Bat Activity Survey Summary Plan



KEY

Site boundary

Automated detector **

Bat foraging and commuting activity *

Common Pipistrelle

Single bat pass

Occasional bat passes

Moderate foraging activity

Soprano Pipistrelle

Single bat pass

Occasional bat passes

Moderate foraging activity

Heavy foraging activity

Myotis Sp.

Single bat pass

Occasional bat passes

Leisler

Single bat pass

Occasional bat passes

Serotine

Single bat pass

* Incidental records of bat foraging and commuting activity made during the Phase 2 emergence surveys are shown in Appendix B.

** Automated detector A failed to record.

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Linden Homes

PROJECT:

Eastergate Ecology

TITLE:

Phase 2 Bat Activity Survey Summary Plan

SCALE AT A3:

Not to scale

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June 2014

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