All Ecology Ltd,
Rose Cottage,
Haw Street,
Coaley,
Dursley,
Gloucestershire,
GL11 5AY
Tel: 01453 861210
Email: info@allecology.co.uk
Web: www.allecology.co.uk

Land off Oakhurst Rise, Charlton Kings, GL52 6NR.

Bat Activity Surveys

Original Report: August 2017
Revision 1: November 2017
Revision 2: April 2018
Revision 3: June 2018

Notice to readers:

The results of the survey and assessment work undertaken by All Ecology are representative at the time of surveying.

Every endeavour has been made to identify the presence of protected species on site, where this falls within the agreed scope of works.

The flora and fauna detailed within this report are those noted during the field survey and from anecdotal evidence. It should not be viewed as a complete list of flora and fauna species that may frequent or exist on site at other times of the year.

Up to date standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on-site.

All Ecology cannot take responsibility where Government, national bodies or industry subsequently modify standards.

All Ecology cannot accept responsibility for data collected from third parties.

Reference to sections or particular paragraphs of this document taken out of context may lead to misrepresentation.

Contents

1.0 Introduction

Background

1.1 All Ecology was commissioned to undertake bat activity surveys at a site known as Land off Oakhurst Rise, Charlton Kings, GL52 6NR. The site is approximately 4 ha in size and is composed of two fields of grassland, a larger field at 3 ha in size, and a smaller field 1ha in size. These are separated by a mature hedge and trees; a line of trees also extends into the larger field from the north boundary. A small number of mature and semi-mature standard trees are also present on site. The site is bound by a mix of hedges and trees, garden hedges, and fences. It is surrounded by residential housing on all aspects except to the south where St Edwards School is situated.

1.2 The site is the subject of a planning application for a new housing development of 90 new dwellings with associated gardens, driveways and a new access road. The new access road would be created through the west boundary of the site and the majority of the central hedge with trees, which extends across the site from north to south would be removed.

1.3 A previous Ecological Appraisal of the site carried out by All Ecology in September 2016 identified that the habitats on site, the hedgerows and lines of trees in particular, have the potential to be important for foraging and commuting bat species and that the removal of sections of hedgerows has the potential to adversely impact on these species.

1.4 The aims of the surveys were to establish the following:

- Which bat species are utilising the sites.
- Level of bat activity on site and presence of important feeding areas and flight corridors.
- Which type of mitigation measures would need to be employed.

1.5 **This revision of the report includes an updated roosting bat and bird nesting mitigation plan.**

Site Location

Aerial Photograph

2.0 Legislation and Status

2.1 All species of bat are listed on Schedule 5 of The Wildlife and Countryside Act (1981) and as such receive protection under Section 9 of this Act. This has been amended several times, most recently by the Countryside and Rights of Way Act 2000, which added 'or recklessly' to Section 9(4) (a) and (b). In summary, it is a criminal offence to.

- intentionally kill, injure or take a wild bat
- be in possession of, or control, any live or dead wild bat or part of, or anything derived from a wild bat
- intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- intentionally or recklessly disturb any wild bat whilst it is occupying a structure or place that it uses for shelter or protection
- transport for sale or exchange, or offer for sale or exchange a live or dead bat or any part of a bat.

2.2 The Conservation of Habitats and Species Regulations 2010, consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licenses in respect of development to permit activities that would otherwise be unlawful.

2.3 Under Section 40 of the Natural Environment and Rural Communities Act (2006) public bodies, including Local and Regional Planning Authorities have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF) to maintain, restore and enhance species and habitats.

2.4 Seven bat species are NERC Priority Species (JNCC, 2017). These are:

- Barbastelle *Barbastella barbastellus*
- Bechstein's *Myotis bechsteinii*
- Noctule *Nyctalus noctula*
- Soprano Pipistrelle *Pipistrellus pygmaeus*
- Brown Long-eared *Plecotus auritus*

- Greater Horseshoe *Rhinolophus ferrumequinum*
- Lesser Horseshoe *Rhinolophus hipposideros*

3.0 Methodology

Field Survey

3.1 The surveys were carried out in general accordance with the Bat Conservation Trust Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

3.2 For the purposes of the survey, the habitats on site were classed as being of moderate quality and as such one visit per transect should be carried out each month from April to October; however, it was agreed with the council ecologist that surveys until August would enable a satisfactory assessment of the site to be carried out as the nature and location of the site is such that any importance of foraging and commuting habitats would be associated with the potential for nearby maternity roosts rather than seasonal changes or movements of bats through the wider area. The size and nature of the site meant that it could be sufficiently covered by two surveyors walking two transects, east and west.

3.3 The manual dusk surveys began just before sunset and continued for at least three hours after sunset. A minimum of four completed circuits of the transects were carried out on each visit with the surveyors beginning at different points for each visit and the transects walked clockwise and anticlockwise alternately to reduce the likelihood of any survey bias. The transects were walked at a steady pace but time taken to make notes was greater in areas where bat activity was higher meaning there was an inevitable increase in the amount of time taken in these areas. These transects also overlapped on the central hedgerow increasing the survey effort along this hedge.

3.4 Two automated detectors were placed along each transect in two locations and data collected for the minimum five day recommended by the guidelines, although this was exceeded in every month.

3.5 Manual dusk activity surveys were undertaken on the 4th April, 1st May, 13th June, 3rd July, and the 1st August 2017.

3.6 The dawn survey took place on the 4th July 2017.

3.7 Automated surveys began/ended to coincide with visits to carry out manual surveys. Automated surveys therefore took place from the:

- 4th April to the 11th April 2017
- 1st May to the 12th May 2017
- 3rd June to the 13th June 2017
- 3rd July to the 10th July 2017
- 1st August to the 7th August 2017

3.8 The surveyors were initially equipped with Echo Meter Touch bat detectors and then Echo Meter Touch 2 Pro bat detectors. Registrations were recorded on the devices and notes were made on species recorded, behaviour, time of registration, location and direction of flight where possible, including incidental observations from surrounding habitats. Where it was not

possible to identify a bat species on site, audio recordings were later analysed using Wildlife Acoustics' Kaleidoscope software. Automated surveys were carried out with one Wildlife Acoustics Song Meters SM2BAT+ and three SM4BAT FS detectors; all microphones were calibrated prior to each use. Data was analysed using Kaleidoscope using the automated analysis feature as well as manual checks to confirm accuracy.

Assessment

3.9 The activity surveys are intended to give an indication of:

- Which bat species use the site.
- The intensity and distribution of bat activity.
- The type of activity such as foraging indicated by characteristic 'feeding buzzes' (attempts at prey capture), commuting, etc.

Personnel

3.10 The survey was carried out by James Godbeer BSc Hons MCIEEM, an ecologist with over 10 years experience working as a consultant and experienced bat surveyors. James has extensive experience of managing environmental contracts, and particular experience in surveying, assessment and mitigation for rare and protected species. He has considerable knowledge of the development and planning process including Ecological Impact Assessments, sustainable ecological design and he has completed ecology chapters of Environmental Statements. James holds a number of protected species licences including bats (all species, all counties, Class Licence Registration No. 2015-12313-CLS-CLS), and Great Crested Newts (Class Licence Registration No. 2016-20363-CLS-CLS). He has successfully obtained European Protected Species mitigation licences for a number of bat species including Lesser Horseshoe, Greater Horseshoe, Serotine, Brown Long-eared, Common Pipistrelle and Natterer's bats, for a number of roost types including maternity and hibernation sites.

Limitations

3.11 The surveys ended in August instead of October for the reasons given above and given the relatively low levels of activity over the course of the survey, which took over the majority of the optimal period any effect on the overall quality of the data is expected to be minimal and the conclusions drawn valid.

3.12 Each survey visit only provides a 'snapshot' of the overall use by bats over the course of part of a year. Multiple visits and automated surveys are carried out in order to increase the confidence in the overall assessment of the site but it is possible that larger numbers of bats are utilising it than those recorded.

3.13 Long-eared bats were recorded on site. These species echolocate more quietly than other species of bats and can be difficult to pick up on bat detectors. They are also one of the latest bats to emerge and it is often not possible to observe them directly. It is therefore more likely that numbers of long-eared bats present on site are greater than those recorded over the course of the surveys although the numbers recorded were low.

4.0 Results

Activity Survey Results

Automated activity surveys

4.1 During the automated surveys the following species were recorded on each of the detectors. The percentages are illustrative and do not provide a reliable comparison of activity between species due to call strength and other factors such as attenuation etc.

Detector 1

- Common Pipistrelle – 2341 recordings – 73.3%
- Soprano Pipistrelle - 304 recordings – 9.51%
- Noctule – 167 recordings – 5.22%
- *Myotis* sp. – 166 recordings – 5.19%
- Serotine – 22 recordings – 0.69%
- Brown Long-eared – 22 recordings – 0.69%
- Lesser Horseshoe - 20 recordings – 0.63%
- Not identifiable – 156 recordings – 4.88%

Detector 2

- Common Pipistrelle – 1818 recordings – 73.75%
- Soprano Pipistrelle - 202 recordings – 8.19%
- Noctule – 146 recordings – 5.92%
- *Myotis* sp. – 123 recordings – 4.99%
- Serotine – 24 recordings – 0.97%
- Lesser Horseshoe - 16 recordings – 0.65%
- Brown Long-eared – 2 recordings – 0.08%
- Not identifiable – 134 recordings – 5.44%

Detector 3

- Common Pipistrelle – 1704 recordings – 76.14%
- Soprano Pipistrelle - 121 recordings – 5.41%
- Noctule – 149 recordings – 6.66%
- *Myotis* sp. – 132 recordings – 5.9%
- Serotine – 12 recordings – 0.54%
- Brown Long-eared – 12 recordings – 0.54%
- Lesser Horseshoe - 7 recordings – 0.31%

- Not identifiable – 156 recordings – 4.51%

Detector 4

- Common Pipistrelle – 674 recordings – 75.9%
- Soprano Pipistrelle - 13 recordings – 1.46%
- Noctule – 131 recordings – 14.75%
- *Myotis* sp. – 22 recordings – 2.48%
- Serotine – 3 recordings – 0.34%
- Not identifiable – 45 recordings – 5.07%

Manual activity surveys

4.2 The following species were recorded over the course of the manual activity surveys:

- Common Pipistrelle – 254 recordings – 69.78%
- Soprano Pipistrelle - 32 recordings – 8.79%
- *Myotis* sp. – 28 recordings – 7.69%
- Noctule – 13 recordings – 3.57%
- Serotine – 11 recordings – 3.02%
- Long-eared – 3 recordings – 0.82%
- Not identifiable – 22 recordings – 6.32%

4.3 The April, May and June surveys recorded activity of occasional foraging passes by Common Pipistrelle bats and Noctules over the site and the surrounding area, along with a small number of Soprano Pipistrelles during the June survey. The earliest Noctules were recorded between 17 and 24 minutes after sunset. The pipistrelle activity began between 34 and 41 minutes after sunset, continuing sporadically throughout the remainder of the surveys. No other species were recorded during these surveys.

4.4 The July and August dusk surveys saw similar levels of activity from Common Pipistrelle, Soprano Pipistrelle and Noctule but a small number of *Myotis*, Serotine and long-eared recordings were made. The earliest Serotine was recorded at 19 minutes after sunset; the *Myotis* and long-eared recordings were made late in the surveys, the earliest being at 89 and 139 minutes after sunset respectively.

4.5 The July dawn survey recorded a small number of Common Pipistrelles as well as brief recordings of Noctule and a *Myotis* species.

4.6 Bat activity in general was dominated by Common Pipistrelle with the majority of the activity taking place along the north and west boundaries as well as foraging passes along the central hedge boundary hedge. Activity minimal along the majority of the south and east boundaries. The small number of recordings of Soprano Pipistrelle, *Myotis*, Serotine and long-eared bats also made along the north and west boundaries as well as the central hedge. A single long-eared bat was briefly recorded on the east boundary during the August survey.

4.7 Noctule activity was that of typical overhead foraging and the majority of the other observed activity was that of foraging and feeding bats with few single passes that might be indicative of commuting behavior.

4.8 Refer to Plan 1 for a graphical representation of the results.

4.9 The following table presents the sunset and sunrise times, and weather conditions encountered during the manual surveys.

Table 1: Sunset and sunrise times, and weather conditions.

Date	Temperature (^{0}C)	Sunset/Sunrise Times	Wind	Cloud Cover (%)
04/04/17 (dusk)	14	19:47	none	90
01/05/17 (dusk)	14	20:33	light	60
13/06/17 (dusk)	21-19	21:28	none	10
03/07/17 (dusk)	18-17	21:30	none	10
04/07/17 (dawn)	15	04:56	light	20
01/08/17 (dusk)	17-15	20:57	none	60

5.0 Evaluation

Activity Surveys

5.1 The manual surveys recorded sporadic foraging of low numbers of Common Pipistrelle with only occasional recordings of Soprano Pipistrelle, Noctule and one or more *Myotis* species. During the automated and manual activity surveys, seven confirmed species of bat were recorded on or close to the site: Common Pipistrelle, Soprano Pipistrelle, Serotine, Noctule, and Lesser Horseshoe. A number of registrations of *Myotis* species were recorded during the surveys although the species could not be conclusively identified. There were also a small number of registrations of long-eared bats. It is not possible to differentiate the two species of long-eared bat found in Britain with the use of detectors but based on the known distribution of these species it is highly likely that the individuals recorded were the more common Brown Long-eared bat, rather than the rare Grey Long-eared bat.

5.2 A total of 6791 recordings of Common Pipistrelle and 672 of Soprano Pipistrelle were made over the course of the surveys. Pipistrelle bats are the most common species of bat in the UK with widespread distributions, most commonly found in England and Wales; Pipistrelle bats exploit a wide range of habitats (BCT, 2010, 2010a). Soprano Pipistrelles are a UK BAP Priority Species; however, the levels of activity on site were not unexpected and it is likely that the site is low to moderate conservation significance for these species.

5.3 A total of 471 recordings of *Myotis* species were made over the course of the surveys. Distribution of *Myotis* species is variable and species dependant. Daubenton's are found throughout the UK; Natterer's are also found across the UK, except northern Scotland, wherever there is suitable woodland; Whiskered/Brandt's bats are found throughout England, Wales, southern Scotland and parts of Northern Ireland although little is known about their individual distributions; Bechstein's have a limited distribution, only found in southern England, Shropshire and occasionally in Wales. These species typically forage and commute throughout the following habitats during the summer months (BCT, 2010b, 2010c, 2010d, 2010e, 2010f);

- Daubenton's – Hunts close to the surface of slow-moving or calm water. Will also forage in trees or along woodland rides, especially if these are associated with water.
- Natterer's – Hunts in tree canopies or close to foliage and by edges of water although at a higher level than Daubenton's bat.
- Whiskered/Brandt's – Whiskered bats forage in a wide range of habitats including parkland, woodlands, flowing water and suburban gardens. Brandt's bat forage more in woodlands and close to water bodies.
- Bechstein's – Forages in areas of closed-canopy woodland close to water. It will also forage along overgrown hedgerows and tree lines.

5.4 Taking into account the distributions and above preferred foraging and commuting habitats, in the absence of water bodies the activity could be attributed to mainly Whiskered bats although this cannot be predicted with certainty. Any of the five *Myotis* species listed above could utilise the site although Bechstein's are considered unlikely. There are variations in the calls of *Myotis* bats but they are often very similar and dependent on the types of habitats being used. Calls within or close to woodland can be particularly difficult to differentiate; sound analysis of the

calls was inconclusive. However, the low to moderate level of activity suggests that site is of low conservation significance for these species.

5.5 A total of 606 recordings of Noctule were made over the course of the surveys although the majority of these are likely to have been the same bat or bats picked up by multiple detectors. Noctules tend to feed over habitats rich in invertebrate fauna such as permanent pasture, woodland edge and hedgerows. It is still a relatively widespread species in much of England, Wales and to southwest Scotland, but has become scarce in some areas of intensive agriculture (BCT, 2010g). The number of registrations of this species is not considered to be notable and the site is likely to be of low conservation significance for this species.

5.6 A total of 72 recordings of Serotine were made over the course of the surveys. Serotine bats are found in a wide range of habitats. They tend to fly at about tree-top height (to about 10 m) often close to vegetation. They are one of the less common species and their distribution is restricted to southern England and South Wales (BCT, 2010h). The number of registrations of this species is not considered to be notable and the site is likely to be of low conservation significance for this species.

5.7 A total of 43 recordings of Lesser Horseshoe were made over the course of the surveys, all on the automated detectors. The Lesser Horseshoe bat is rare in the British Isles and is confined to Wales, western England and western Ireland (BCT, 2010i). It is a NERC Priority species but the low level of activity by a low numbers of individuals in the early hours of the mornings is not indicative of the site being important for commuting and of only minor interest in terms of foraging suggesting the site is of low conservation significance for the species.

5.8 A total of 39 recordings of long-eared bats were made over the course of the surveys. Brown Long-eared bats are one of the most common bat species in England, Britain and the UK. Their distribution extends across the UK wherever there is suitable habitat (BCT, 2010j); they are listed as a NERC Priority Species. The Grey Long-eared bat is a southern European Species with a distribution that extends to south England where it is very rare and restricted to a few colonies in Sussex, Hampshire, the Isle of Wight, Dorset, Devon and Somerset (BCT, 2010k). They tend to forage meadows, grasslands and forest edges. It is not possible to distinguish between these species with sound analysis although it is highly likely that individuals recorded on site were the common Brown Long-eared bat. Although these species can be difficult to detect, the small number of registrations indicates that the site is likely to be of low conservation significance for this species.

Site Status Assessment

5.9 There are a number of roosting opportunities on site for bats, in cavities in mature trees. Separate surveys of these have been carried out, the findings of which are presented in a separate report. In summary, these identified a Common Pipistrelle day roost. Other day roosts cannot be ruled out due to the nature of such roosts and known switching behaviour; however, the presence of a maternity roost was ruled out with a high level of confidence and this is supported by the findings of the present activity survey, which also found levels of activity that were not indicative of a nearby maternity roost.

5.10 The results of the surveys would appear to indicate that the site is visited by a small number of species for mainly foraging activity. No important commuting routes have been identified with

the majority of the activity attributed to bats foraging along the west boundary hedge/scrub and trees as well as along the central hedge and trees, and north boundary, which is not unexpected.

5.11 Overall the levels of activity by species was below that which would have been expected for a site of this nature as the areas of apparently optimal habitat appear to be under utilised. The presence of Lesser Horseshoes is of minor note but these were not recorded during the manual surveys and automated recordings indicate only sporadic late night use which is not entirely unexpected given the known distribution of this species.

6.0 Impacts and Recommendations

Impacts

6.1 The site is the subject of a planning application for a new housing development of approximately 100 new dwellings with associated gardens, driveways and a new access road. A new access road would be created into the site and the majority of the central hedge with trees, which extends across the site would be removed.

6.2 In the absence of any consideration or mitigation for bats, the following potential impacts with respect to the bats currently using the site for foraging and commuting have been identified:

- Permanent loss of 3.5 ha of poor semi-improved grassland (sub-optimal habitat). Based on the activity recorded on site this is regarded as being a minor adverse impact.
- Removal of trees on the north boundary and north portion of the site as well the majority of the central hedge/trees and a section of hedge along the west boundary. Optimal foraging habitat but surveys found low levels of use by mainly common species and only sporadic occasional use by more notable species. Minor adverse impact.
- Temporary and permanent disruption of areas of bat foraging habitat on the retained site boundaries through unsympathetic use of lighting. Low adverse impact based on survey evidence but potential for moderate adverse impacts.
- Construction of new buildings and gardens creating sheltered areas for foraging Moderate beneficial impact provided lighting is appropriate.
- Provision of roosting features in buildings and on retained mature trees. Major beneficial impact.

Further Surveys

6.3 No further surveys are required at this time. Sufficient surveys have been carried out to satisfy the agreed survey effort and repeat surveys would not be required unless the proposals are delayed by two years or more.

Provision for Bats

6.4 The proposals for the site will inevitably result in the short term loss of foraging habitat for the species recorded on site during the surveys. However, based on the results of the present surveys and the nature of the habitats on site, no significant negative impacts on the conservation status of these species is predicted provided the following recommendations are implemented to maximise the potential for biodiversity gains within the development.

6.5 Overall, there is an availability of similar foraging habitats in the surrounding area and the new development is not expected to cause any significant fragmentation of these habitats as sufficient surrounding vegetation will be retained around the development.

6.6 No significant commuting routes were identified but it will be essential to ensure that an appropriate lighting scheme is put in place to ensure that adjacent off site and boundary vegetation remains suitable for bats, particularly the more light sensitive species such as horseshoe, long-eared bats and *Myotis* species. External lighting should be kept to minimum in line with current best practice and should not exceed minimum requirements. It should include the use of column lighting, with full cut-off directional shielding to ensure that lighting is directed only where required and light spill into adjacent areas and skyglow is minimized. Low-UV lights with a wavelength of 590 nm (warm LED) should be used to minimise direct and indirect impacts to bats. The west boundary hedge and trees were the focus of a large portion of the activity over the course of the surveys and these features should be retained and left unlit as far as it is possible.

6.7 Where the section of hedge/scrub is to be removed at the site entrance, it is proposed that trees be retained either side of the gap and allowed to increase in height or ideally allow standard trees to mature to minimise the impact of the hedge removal; however, given the relatively limited activity associated with the hedge, this recommendation is precautionary only. The retained boundary vegetation around the site is to be enhanced through the planting of new trees/shrubs to fill gaps in order to maintain and enhance suitable foraging and commuting habitats around the site. The new residential gardens are expected to provide new foraging opportunities for bats in addition to the retained trees in the north and south portions of the current central hedge.

6.8 In order to generally enhance the development for roosting bats, it is proposed that a number of bat tubes be installed on the new buildings and bat boxes on trees (see Plan 2). Bats are very particular about the internal conditions of bat boxes, so by providing several bat boxes with different aspects creates differences in temperature, humidity etc. thereby increasing the chance of colonisation.

Timing of Works

6.9 There are no timing constraints for the proposed development as the tree containing the roost will be retained and no no significance is attached to the results of the present survey. However, it is recommended that any vegetation removal and ongoing tree and hedge maintenance works be carried out outside the bird-nesting season of March to August. Works during this time should not commence until a suitably qualified ecologist has carried out a nesting bird survey. If any active nests are discovered then the nest and surrounding habitat must be left undisturbed until the young have fledged.

Care and Vigilance during Works

6.10 When carrying out tree removals and ongoing tree maintenance works, the following procedures should be employed in the unlikely event a bat or bats are discovered:

- If the roost is still on the tree and bats are not injured, seek advice from a licensed ecologist. If help is not available, allow bats to fly out of harm's way.
- If the timber is felled, the roost is not exposed and the bats are not injured, temporarily seal and isolate the roost and seek advice from a licensed ecologist. If advice is not readily available, position the roost off the ground, re-open it and allow bats to relocate of their own accord.

- If the roost has been exposed, and especially if bats have been injured, collect bats in a secure box or bag (using a glove) and contact a licensed ecologist.
- Note the date, locality, type of tree, situation in tree and bat species if known.

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8.0 Plans

Plan 1 - Bat Activity Survey Results (Indicative)

Plan 2 - Indicative Bat and Bird Mitigation

Roost/nest features and boundary planting