Delcroft and land beyond, Woodchurch Rd, Shadoxhurst, Kent

Bat Night-time Surveys

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Client: FDC Homes

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1 Introduction

1.1 Background to the Scheme

Following a 'Preliminary Ecological Appraisal' which identified the risk of bats being present, KB Ecology Ltd has been commissioned to undertake bat activity surveys with regards to a proposed development at Delcroft and land beyond, Woodchurch Rd, Shadoxhurst, Kent, in support of a planning application for the demolition of the existing bungalow and erection of a number of new dwellings.

1.2 Survey Objectives

The objectives of the surveys were as follows:

1. To determine whether the proposed site is used by bats at any time of the year;
2. To determine whether the proposed development would be likely to displace bats from roost sites or foraging areas.

1.3 Limitations

The findings of this report represent the professional opinion of a qualified ecologist and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document.

2 Methodology

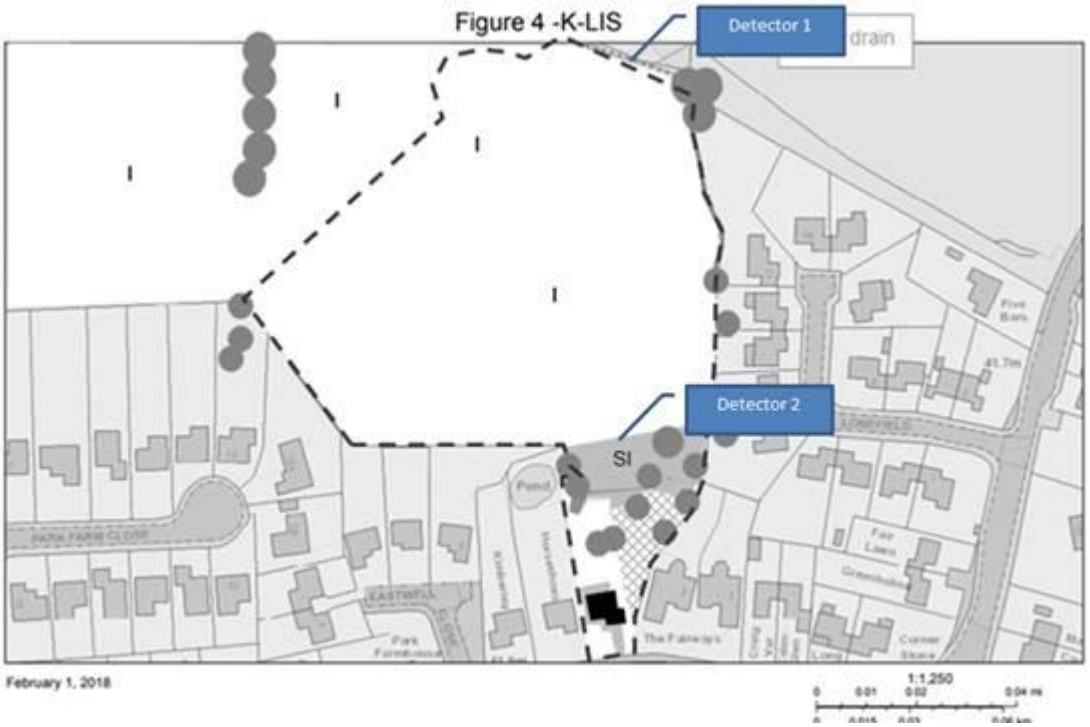
The boundary vegetation of the site is likely to be used by foraging and commuting bats but the sheep pasture is unlikely to be of much interest, being improved. The Bat Conservation Trust's guidelines provide a table stating the number of bat activity surveys recommended to achieve a reasonable survey effort in relation to habitat suitability.

Table 8.3 Guidelines on the number of bat activity surveys recommended to achieve a reasonable survey effort in relation to habitat suitability.

Survey type	Low suitability habitat for bats[a]	Moderate suitability habitat for bats	High suitability habitat for bats
Transect/spot count/timed search surveys	One survey visit[b] per season (spring – April/May, summer – June/July/August, autumn – September/October)[c] in appropriate weather conditions for bats Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone	One survey visit[b] per month (April to October)[c] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.	Up to two survey visits[b] per month (April to October)[c] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.
AND			
Automated/static bat detector surveys[d]	One location per transect, data to be collected on five consecutive nights per season (spring – April/May, summer – June/July/August, autumn – September/October)[c] in appropriate weather conditions for bats	Two locations per transect, data to be collected on five consecutive nights per month (April to October)[c] in appropriate weather conditions for bats	Three locations per transect, data to be collected on five consecutive nights per month (April to October)[c] in appropriate weather conditions for bats

As the site is small, only monthly static detector surveys (with two Anabat Express static detectors left on site for five consecutive nights) were undertaken from April 2018 until the time of this report. The data was analysed by Megan Austin, who has seven years of experience in night-time bat surveys and has undertaken Analook Training Course in 2014.

Figure 4 -K-LIS



3 Status of Species and Protection

Thirteen of the eighteen species of British bat have been recorded in Kent[1]: noctule *Nyctalus noctula*, Leisler's *Nyctalus leisleri*, serotine *Eptesicus serotinus*, whiskered *Myotis mystacinus*, Brandt's *Myotis brandtii*, Alcathoe bat *Myotis alcathoe,* Daubenton's *Myotis daubentonii*, Natterer's *Myotis nattereri*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Bechstein's *Myotis bechsteinii*, brown long-eared bat *Plecotus auritus* and Nathusius' pipistrelle *Pipistrellus nathusii*.

The following specific species information for Kent was taken from the Kent Red Data Book, dating 2000 (no information was presented about grey long-eared bat, Bechstein's bat, Alcathoe bat and soprano pipistrelle).
http://www.kent.gov.uk/NR/rdonlyres/45546CD6-4BEC-40AC-9D39-0A6C64D4787E/191/kentreddatabook.pdf

Table 1: Local information about bat species distribution

Common name	Distribution
serotine	Mainly found south of a line from the Wash to South Wales. In Kent, records show it to be widely distributed across the county, though in small numbers.
Brandt's bat	Widespread in England and Wales to southern Scotland. The Brandt's bat is very closely related to the whiskered bat and, although recognised as a separate species in 1970, most records do not differentiate between the two making distribution data uncertain. In Kent there have been few records, the most recent being from Hadlow.
Daubenton's bat	Common and widespread in England and Wales extending to northern Scotland. In Kent it has a widespread distribution. Most individual records are from hibernacula, though groups may have been seen foraging in summer over waterbodies throughout Kent. Only two maternity roosts have been found, one in a sandmine at Chipstead, Sevenoaks, and the second in an oak at Southborough.
whiskered bat	Widespread in England and Wales to southern Scotland. The whiskered bat is very closely related to the Brandt's bat and, although recognised as a separate species in 1970, most records do not differentiate between the two making distribution data uncertain. In Kent, records are widespread but more common in the north-west and mainly away from the coast.
Natterer's bat	Found throughout England and Wales and through Scotland north to the Great Glen fault. In Kent it has a widespread distribution in small numbers. Most records are from hibernacula, usually one or two animals per site. One confirmed maternity roost has been found in a castle near Hythe, and three further summer roosts are known, two in timbered barns. Other summer records include scattered individuals that have been found grounded.

[1] see http://www.kentbatgroup.org.uk/batsinkent.html

Common name	Distribution
Leisler's bat	Widespread but scarce in the UK to southwest Scotland, common in Ireland. The only confirmed maternity colony in Kent, occupying several sites, was recorded in the north-west of the county.
noctule	The noctule occurs in England, Wales and south-west Scotland. This species is almost exclusively tree roosting, and most Kent records are from the use of bat detectors. Very few roosts have been discovered, and some of these no longer appear to be used. The only known one in current use (1999), and believed to be a maternity roost, is in a beech tree in the grounds of Leeds Castle. The records suggest it is thinly distributed in the north of the county although this may reflect observer bias.
pipistrelle	These are the UK's most common bats and both species are found throughout Britain. Some recording of the two species has been undertaken in Kent since 1996 and it has been established that both species are distributed throughout Kent. A number of maternity roosts of both species have been identified. However, KBG records pre-dating 1997, and some since that date, treat them as a single species.
brown long-eared bat	This species is probably the most common bat in Britain after the pipistrelles and is found throughout the UK. It is widely distributed in Kent, but has not been recorded on Sheppey or the Dungeness peninsula.

All species of bat are afforded full legal protection under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). They are also listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 and are therefore a “European Protected Species” (EPS). Some species of bats (noctule, soprano pipistrelle, brown long-eared bat, barbastelle) are also listed as species of principal conservation importance.

The legislation makes it a criminal offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat;
- Intentionally or recklessly obstruct access to a bat roost.

For more information, guidance from Natural England is available at https://www.gov.uk/bats-protection-surveys-and-licences

4 Results

A total of 1,305 bat calls of seven species of bats were recorded during the 2018 static monitoring surveys (which encompassed 25 nights of recording).

The majority of bat passes were of common pipistrelle bats, representing over 74% of all bat passes, followed by *Myotis* sp, brown long-eared bats, soprano pipistrelle bats, serotine, Nathusius pipistrelle and noctule bats.

pip45	pip55	Nathpip	BLE	Myotis	Noct	Sero	**Grand Total**
969	29	2	125	174	2	4	**1305**
74.3	2.2	0.2	9.6	13.3	0.2	0.3	**100.0**

Serotine bat(s) were only recorded during the July recordings, Nathusius' pipistrelle only in April and noctule only in June (only one call recorded). In April only pipistrelle bats (the three species) were recorded. *Myotis sp* records were mainly from August with 117 calls recorded in August against 0, 37, 10 and 10 in the previous months.

The detailed data is present in Appendix A.

5 Impact Assessment

Seven species have been recorded using the site. The impacts of the proposed development include:

- Loss of grassland and scrub as foraging habitat for bats.
- Potential fragmentation or loss of foraging habitat via increase in artificial lighting throughout.

Lighting can be detrimental to roosting, foraging and commuting bats[2] (although pipistrelle species often take advantage of the concentration of insects around white street lights as a source of prey, this is not true for long-eared bats, which generally avoid street lights). Five of the seven species detected, the common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine and noctule bats, are species which are not negatively impacted by street lights. The other two species, Myotis sp (which could be Daubenton's, whiskered, Brandt's, Natterer's or, alcathoe) and brown long-eared bat can be adversely affected by lighting (see below[3]).

Table 5.2. Summary of predicted impacts of lighting for each species/group according to bat behaviour. Further research is required to have high confidence in many of these predictions and therefore they should be used as guidance only.

Impact / Behaviour	High	Medium	Low
Maternity roost	All species	-	-
Night roost	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*	-
Emergence	All species	-	-
Foraging	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Commuting	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Swarming	All species	-	-
Hibernation	All species	-	-

[2] http://www.bats.org.uk/pages/bats_and_lighting.html and http://www.batsandlighting.co.uk/index.html for more information

[3] see Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation http://www.bats.org.uk/data/files/Bats_and_Lighting_-_Overview_of_evidence_and_mitigation_-_2014_UPDATE.pdf

6 Recommendation / Mitigation

As it is proposed to create a large pond and turn the retained sheep pasture into a meadow (for the benefit of reptiles and other wildlife), these features are expected to provide new foraging opportunities for the local bat population, which should balance out the loss of pasture and scrub.

It is also recommended that the landscape proposal integrate plants which are known to benefit bats.[4]

Finally, the proposed lighting will consider the recommendations from the Bat Conservation Trust called *Bats and Lighting in the UK* (Appendix B).

[4] More information can be found here
http://www.bats.org.uk/publications_download.php/231/Encouraging_bats_English_2010.pdf

7 References and Bibliography

- Collins, J. (ed.) (2016) Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation trust, London
- English Nature (2004). *Bat Mitigation Guidelines.* English Nature, Peterborough
- Hundt, L (2012). *Bat surveys: Good Practice Guidelines, 2nd Edition*. Bat Conservation Trust.
- Joint Nature Conservation Committee (1999). *Bat Workers Manual*, JNCC, Peterborough.
- Waite, A. (Editor) (2000). *The Kent Red Data Book*. Kent County Council. Maidstone, Kent.

Website Visited:

- Google Earth for background aerial photos. With permission from Google Earth Brand.

Appendix A – Static Monitoring Results

Count of Passes	Column Lab										
Row Labels	pip45	45pipsoc	pip55	55pipsoc	Nathpip	BLE	Myotis	Noct	Sero	(blank)	Grand Total
April	**59**	**4**	**1**		**2**						**66**
North	**54**	**2**	**1**								**57**
20180425	1										1
20180426	5	1									6
20180427	41	1	1								43
20180428	7										7
20180429											
South	**5**	**2**			**2**						**9**
20180425	2										2
20180426	1				2						3
20180427	2	2									4
20180428											
20180429											
May	**288**	**12**	**8**			**17**	**37**	**1**			**363**
North	**167**	**5**	**2**			**1**	**30**				**205**
20180523	105	1	2				18				126
20180524	62	4				1	12				79
20180525											
20180526											
20180527											
South	**121**	**7**	**6**			**16**	**7**	**1**			**158**
20180523	9	1									10
20180524	6	6	2			1					15
20180525	27					2					29
20180526	33					8	5	1			47
20180527	46		4			5	2				57
June	**213**	**5**				**25**	**10**				**253**
North	**82**					**1**	**8**				**91**
20180614											
20180615	64						4				68
20180616	5					1	2				8
20180617	8										8
20180618	5						2				7
South	**131**	**5**				**24**	**2**				**162**
20180614											
20180615	21	1				3	1				26
20180616	25	1				7					33
20180617	49	1				5					55
20180618	36	2				9	1				48

Count of Passes	Column Lab										
Row Labels	pip45	45pipsoc	pip55	55pipsoc	Nathpip	BLE	Myotis	Noct	Sero	(blank)	Grand Total
July	**326**	**80**	**17**			**48**	**10**		**4**		**485**
North	**159**	**28**	**8**			**20**	**7**		**4**		**226**
20180725	61	10	2			16	3		3		95
20180726	57	10	3			4	1		1		76
20180727	20		2								22
20180728	21	8	1				3				33
South	**167**	**52**	**9**			**28**	**3**				**259**
20180725	15	5	1			19	1				41
20180726	25	1	6			4					36
20180727											
20180728	127	46	2			5	2				182
20180729											
August	**83**	**15**	**3**	**1**		**35**	**117**	**1**			**255**
North	**39**	**6**	**2**			**14**	**72**	**1**			**134**
20180824	4					2					6
20180825	5					3					8
20180826							6				6
20180827	7	1				2	57				67
20180828	23	5	2			7	9	1			47
South	**44**	**9**	**1**	**1**		**21**	**45**				**121**
20180824	1			1			14				16
20180825	12	2				4	7				25
20180826											
20180827	22	4				6	22				54
20180828	9	3	1			11	2				26
Grand Total	**969**	**116**	**29**	**1**	**2**	**125**	**174**	**2**	**4**		**1422**

Appendix B - Bats and Lighting in the UK

Bat Conservation Trust and Institution of Lighting Engineers
Summary of requirements

The two most important features of street and security lighting with respect to bats are:
1. **The UV component**. Low or zero UV installations are preferred to reduce attraction of insects to lighting and therefore to reduce the attraction of foraging bats to these areas.
2. **Restriction of the area illuminated**. Lighting must be shielded to maintain dark areas, particularly above lighting installations, and in many cases, land adjacent to the areas illuminated. The aim is to maintain dark commuting corridors for foraging and commuting bats. Bats avoid well lit areas, and these create barriers for flying bats between roosting and feeding areas.

UV characteristics:
Low
• Low pressure Sodium Lamps (SOX) emit a minimal UV component.
• High pressure Sodium Lamps (SON) emit a small UV component.
• White SON, though low in UV, emit more than regular SON.

High
• Metal Halide lamps emit more UV than SON lamps, but less than Mercury lamps
• Mercury lamps (MBF) emit a high UV component.
• Tungsten Halogen, if unfiltered, emit a high UV component
• Compact Fluorescent (CFL), if unfiltered, emit a high UV component.

Variable
• Light Emitting Diodes (LEDs) have a range of UV outputs. Variants are available with low or minimal UV output.

Glass glazing and UV filtering lenses are recommended to reduce UV output.

Street lighting
Low-pressure sodium or high-pressure sodium must be used instead of mercury or metal halide lamps. LEDs must be specified as low UV. Tungsten halogen and CFL sources must have appropriate UV filtering to reduce UV to low levels.
Lighting must be directed to where it is needed and light spillage avoided. Hoods must be used on each lamp to direct light and contain spillage. Light leakage into hedgerows and trees must be avoided.
If possible, the times during which the lighting is on overnight must be limited to provide some dark periods. If the light is fitted with a timer this must be adjusted to reduce the amount of 'lit time' and provide dark periods.

Security and domestic external lighting
The above recommendations concerning UV output and direction apply. In addition:
Lighting should illuminate only ground floor areas. Light should not leak upwards to illuminate first floor and higher levels.
Lamps of greater than 2000 lumens (150 W) must not be used.
Movement or similar sensors must be used. They must be carefully installed and aimed, to reduce the amount of time a light is on each night.
Light must illuminate only the immediate area required, by using as sharp a downward angle as possible. Light must not be directed at or close to bat roost access points or flight paths from the roost. A shield or hood can be used to control or restrict the area to be lit.

Wide angle illumination must be avoided as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.
Lighting must not illuminate any bat bricks and boxes placed on buildings, trees or other nearby locations.