Land off Thorncliffe Road,

Leek, Staffordshire, ST13 6NH

Update Bat Survey Report

October 2019

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1 Introduction

1.1 *Introduction*

This report presents the results of bat surveys undertaken at land adjacent to Thorncliffe Road, Leek, Staffordshire, ST13 6NH. The surveys were commissioned to inform an outline planning application for the proposed residential development on the application site. The site lies within the administrative boundaries of Staffordshire Moorlands District Council. The bat surveys were conducted in May and June 2017 by Gemma Longman ACIEEM and Ben McLean ACIEEM of Quants Environmental Ltd with an update bat survey undertaken in September 2019. A desk-based study was also undertaken to obtain existing ecological information of the site and the surrounding area.

1.2 *Background*

A series of bat surveys were undertaken based on the recommendations of the April 2017 Ecological Appraisal[1], these included:

- 2 dusk bat activity transect surveys.
- 2 static detectors placed on site for a min. five-day period.

Due to expiration of the 2017 surveys, an updated bat activity transect survey was undertaken in September 2019.

1.1 *Development Proposal*

The proposed development (residential development) covers the northern fields of the larger site surveyed in 2017. Please refer to the design plan in Appendix 3.

1.2 *Site Description*

The site is located within a semi-rural location at grid reference SK 00022 57220 and covers ~ 5.6 hectares. Figure 1 provides an illustration of the site location. The application site is located on the north-east periphery of the market town of Leek.

1.3 *Aims*

The aim of the survey was to assess the use of the site by bats and to inform the development proposals for the site, including recommendations for applying appropriate mitigation.

[1] Land off Thorncliffe Road, Leek. Ecological Appraisal Report; Quants Environmental Ltd; dated April 2017

Figure 1. Site location (outlined in red) (aerial imagery dated 2017).



2 Survey Methodology

2.1 *Static Bat Recording*

Static bat recorders were simultaneously placed at two locations on the site (see Figure 2) for a period of 7 nights from 19th June 2017 to 25th June 2017 and 17th September 2019 to 23rd September 2019. The static bat recorders (model: Anabat express) recorded frequency division bat sound, and were set to record from 30 minutes before sunset until 30 minutes after sunrise for each the survey period.

One static bat recorder was placed within the central hedgerow in the location numbered '1' in Figure 2 and the second bat recorder was positioned within the southern hedgerow in the location numbered '2' in Figure 2. Both locations are considered to be suitable bat habitat features.

Weather conditions were recorded for the duration of the static bat detector deployment. Over the 7-night period from 19th June to 25th June 2017, the nocturnal temperatures recorded ranged between 11.2 °C and 26.5 °C and from 17th September to 23rd September 2019, the nocturnal temperatures recorded ranged between 2.75 °C and 26.5 °C. The weather conditions during the both periods were mostly dry with occasional light rain. In summary, the weather conditions during the period were good in terms of bat recording.

The recorded bat sounds (sonograms) were subsequently analysed using the computer programme Analook. The sonograms were analysed through comparison with published bat sound parameters (maximum frequency, minimum frequency, peak frequency, call duration, inter-pulse interval etc) and a library of sonograms of confirmed species identity, in order to identify each bat sound to species or genera level wherever possible. The number of bat registrations per species was recorded for each location.

2.2 *Dusk/Nocturnal Bat Activity Survey*

Two dusk bat activity transect surveys (25th May 2017 and 19th June 2017) were undertaken on the site by Gemma Longman and Ben McLean (both surveyors hold a Natural England survey licence for bat species[2]) and a single dusk bat activity transect survey (17th September 2019) was undertaken on the site by Joe Bamforth and Nick Clayton.

Echo Meter Touch 2 Pro bat detectors were used during the surveys. The aim of the survey was to determine the number and species of bats which forage/commute within and adjacent to the site.

The transect route is shown in Figure 2; the route began from Location 1, continuing numerically until finishing at Location 8 with the route reversed on the second survey undertaken on 19th June 2017.

The transect survey involved walking the transect route slowly and recording all bat observations on scale maps with notes on species and activity/behaviour. At each of the Stationary Listening Points (SLPs) the surveyors stopped for a period of approximately 3 minutes to record all bat activity during that period. Any bat activity observed whilst walking between the SLPs was also recorded.

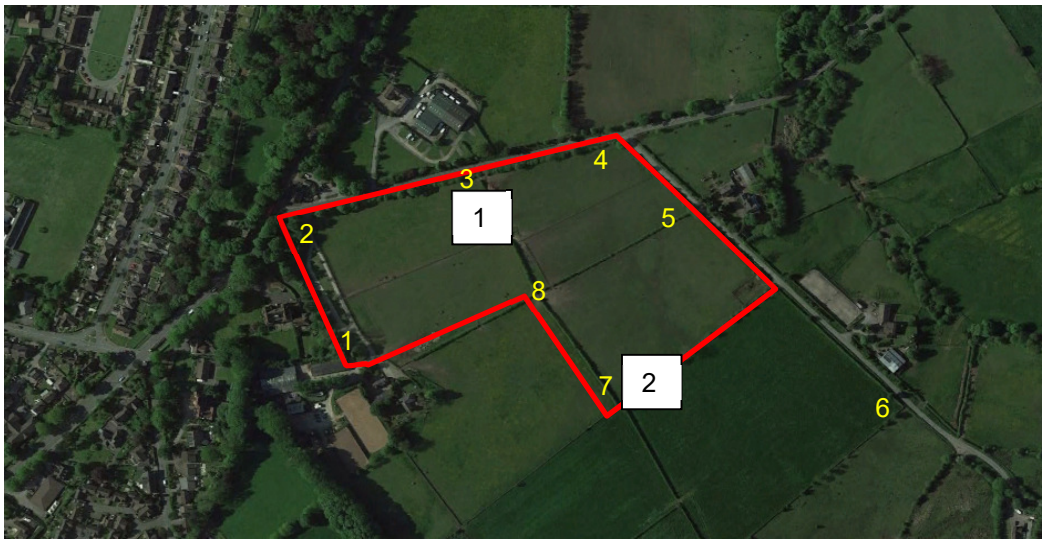
The survey date and weather conditions are presented in Table 1.

[2] Natural England Survey Registration Number: Gemma Longman: WLM-A34 - Level 1: 2017-27778-CLS-CLS / Ben McLean: WML-A34-Level 2- 2016-24500-CLS-CLS.

Table 1. Bat Activity Survey Conditions

Date	Sunset	Survey Duration	Weather Conditions
25th May 2017	21:13	21:10 – 23:25	Dry. Wind Bft[3] 1, cloud 0/8. 20.5 ºC at start of survey 18ºC at end of survey
19th June 2017	21:38	21:35 – 23:35	Dry. Wind Bft 1, cloud 5/8, 26 ºC at start of survey 23ºC at end of survey
17th September 2019	19:18	19:18 – 21:12	Dry. Wind Bft 1, cloud 2/8, 13ºC at start of survey 9ºC at end of survey

Figure 2. Dusk bat transect survey route from location 1-8 with site boundary outlined in red. Numbers indicate Stationary Listening Points (SLPs) and white numbered squares = locations of static bat recorders (numbered 1 and 2).



2.3 *Survey Comments*

The surveys were undertaken within the main bat survey season (May to September inclusive) during suitable weather conditions. All parts of the site were fully visible during the surveys and there were no significant survey limitations.

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[3] The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. 0 = no wind. 12 = hurricane conditions

3 Survey Results

3.1 *2017 Static Bat Recording*

The number of bat passes for each static bat recorder location are summarised in Table 2.

Five bat species were recorded during the surveys: common pipistrelle *Pipistrellus pipistrellus*, Soprano pipistrelle *Pipistrellus pygmaeus* Brown long-eared *Plecotus auritus*, Myotis species indicative of Whiskered *Myotis mystacinus* or Brandt's *Myotis brandtii* and Noctule *Nyctalus noctula*. The total number of bat passes was significantly greater for the southern hedgerow (location 2) compared to the central hedgerow (location 1).

At location 1, a total of 46 bat passes was recorded over the seven nights the static detectors were deployed, compared with a total of 546 bat passes at location 2.

Common pipistrelle was the most abundantly recorded species at both survey locations, although the number of passes was much lower at Location 1 compared to Location 2 (46 passes at Location 1 and 546 passes at Location 2). Similarly, passes of Myotis species was higher at Location 2 with 33 passes recorded, compared to one pass at location 1 and passes of brown long-eared bats was higher at Location 2 with 12 passes recorded, compared to just one at Location 1. Noctule was not recorded at Location 2, whereas 2 passes were recorded at Location 1 and 4 passes of soprano pipistrelle was recorded at Location 2 whereas none were recorded at Location 1.

3.2 *2019 Static Bat Recording*

The number of bat passes for each static bat recorder location are summarised in Table 2.

Seven bat species were recorded during the surveys: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus,* brown long-eared *Plecotus auritus*, myotis species indicative of whiskered *Myotis mystacinus*, natterer's *Myotis nattereri* or brandt's *Myotis brandtii,* noctule *Nyctalus noctula,* leisler's *Nyctalus leisleri* and serotine *Eptesicus serotinus*. The total number of bat passes was significantly greater for the southern hedgerow (location 2) compared to the central hedgerow (location 1).

At location 1, a total of 259 bat passes was recorded over the seven nights the static detectors were deployed, compared with a total of 479 bat passes at location 2.

Myotis species indicative of Whiskered, Natterer's or Brandt's was the most abundantly recorded species at both survey locations, although the number of passes was much lower at Location 1 compared to Location 2 (89 passes at Location 1 and 235 passes at Location 2). Similarly, passes of common pipistrelle was higher at Location 2 with 192 passes recorded, compared to 89 pass at location 1 and passes of serotine was higher at Location 2 with 2 passes recorded, compared to just one at Location 1. Leisler's was not recorded at Location 2, whereas 16 passes were recorded at Location 1, 18 passes of soprano pipistrelle was recorded at Location 2 whereas 23 were recorded at Location 1. Passes of brown long-eared bats was higher at location 1 with 26 passes recorded, compared to 18 passes recorded at location 2 and passes of noctule was higher at location 1 with 15 passes recorded, compared to 14 passes recorded at location 2.

Table 2: Static Bat Recorder Results June 2017 and September 2019 (Location 1 and Location 2)

Dates		**19th to 25th June 2017**	
SM2 Location	**Species**	**Total no. passes per species**	**Total bat registrations**
Location 1 Central hedgerow SK 00011 57220	Common pipistrelle	42	46
	Brown Long-eared bat	1	
	Myotis bats (likely Whiskered / Brandt's)	1	
	Noctule	2	
Location 2 Southern hedgerow SK 00149 57114	Common pipistrelle	497	546
	Soprano pipistrelle	4	
	Brown Long-eared bat	12	
	Myotis bats (likely Whiskered / Brandt's Brandt's)	33	
Dates		**17th to 23rd September 2019**	
Anabat Express Location	**Species**	**Total no. passes per species**	**Total bat registrations**
Location 1 Central hedgerow SK 00011 57220	Common pipistrelle	89	259
	Brown long-eared bat	26	
	Myotis bats (likely whiskered / Brandt's / Natterer's)	89	
	Soprano pipistrelle	23	
	Leisler's	16	
	Serotine	1	
	Noctule	15	
Location 2 Southern hedgerow SK 00149 57114	Common pipistrelle	192	479
	Soprano pipistrelle	18	
	Brown long-eared bat	18	
	Serotine	2	
	Noctule	14	
	Myotis bats (likely whiskered / Brandt's / Natterer's)	235	

3.3 *2017 Transect Survey Results*

Overview of Transect Survey

The majority of the observed bats were flying in close proximity to hedgerow / tree line features. Bat activity observed during both surveys undertaken in May and June was low - moderate with bats recorded at every SLP with the exception of SLP 1. The majority of bats recorded throughout the duration of the surveys were common pipistrelle with a maximum count of 28 records during the survey undertaken in May. Seven records of Myotis species was recorded during the May survey compared to one in June and one soprano pipistrelle bat was recorded during the survey in May (none in June). Two noctule bats were recorded in June, but not May. The majority of bat foraging activity was observed towards the southern end of the site, where there is the least disturbance from roads and houses, between SLPs 4-7, with the highest activity recorded along the southern hedgerow with a maximum of 4 Myotis species and 3 common pipistrelle bats recorded at SLP 5 in May. Raw survey data presented in Tables 3 and 4.

3.4 *2019 Transect Survey Results*

Overview of Transect Survey

The majority of the observed bats were flying in close proximity to hedgerow / tree line features. Bat activity observed during the survey was low - moderate with bats recorded at every SLP with the exception of SLP 1 and 3. The majority of bats recorded throughout the duration of the surveys were common pipistrelle with a maximum count of 15 records during the survey. Six records of Myotis species was recorded during the survey and two soprano pipistrelle bats were recorded during the survey. Two noctule bats were recorded during the survey. The majority of bat foraging activity was observed towards the southern end of the site, where there is the least disturbance from roads and houses, between SLPs 4-7, with the highest activity recorded along the southern hedgerow with a maximum of 4 common pipistrelle bats recorded at SLP 5. Raw survey data presented in Tables 3 and 4.

Table 3: 25th May 2017 - Dusk Bat Activity Transect Results

Time	Location (see Fig 2)	Species	Notes
25th May 2017			
21:13	1	N/a	No activity
21:34	2	Common pipistrelle	Flew West to East
21:39	3	N/a	No activity
21:44	Between SLPs	Common pipistrelle	Travelling east along hedgerow
21:46	4	N/a	No activity
21:49	Between SLPs	Myotis species	Unseen (registration only)
21:52	5	Common pipistrelle x 3 and Myotis species x 4 Common pipistrelle x 2 and Myotis species x2	West to East along hedgerow (south of hedgerow) East to West (south side of hedgerow)
22:07	6	Common pipistrelle 1 x Common pipistrelle	Unseen (registration only) North to South along road
22:16	7	1 x Common pipistrelle	Unseen (registrations only). Regular foraging passes
22:28	8	1 x Common pipistrelle 1 x Common pipistrelle	Unseen (registration only) West to East across field
22:36	1	N/a	No activity
22:42	2	1x Common pipistrelle	Unseen (registration only)
22:45	Between SLPs	1x Common pipistrelle	Unseen (registration only)
22:48	3	N/a	No activity
22:53	Between SLPs	1x Common pipistrelle	Social call
22:54	4	1x Common pipistrelle	Unseen (registration only)
23:01	5	1x Common pipistrelle	Unseen (registration only)
23:04	6	1x Common pipistrelle	Unseen (registration only)
23:11	7	1x Common pipistrelle 2 x Common pipistrelle	Unseen (registration only) Foraging pass
23:15	Between SLPs	1 x Soprano pipistrelle	Unseen (registration only)
23:19	8	Common pipistrelle	4 x foraging passes (unseen)

Table 4: 19th June 2017 - Dusk Bat Activity Transect Results

Time	Location (see Fig 2)	Species	Notes
19th June 2017			
21:38	1	N/a	No activity
21:43	8	N/a	No activity
21:53	7	N/a	No activity
22:15	6	N/a	No activity
22:23	5	Common pipistrelle	Flying North to South along road
22:31	Between SLPs	Common pipistrelle Noctule	Flying North to South along road Unseen (registration only)
22:34	4	Common pipistrelle Noctule	Unseen (3 passes) Unseen
22:39	3	Common pipistrelle Myotis species	Flying east Unseen (registration only)
22:45	2	1 x Common pipistrelle	Unseen (registrations only).
22:51	1	N/a	No activity
22:56	8	1 x Common pipistrelle	Unseen (registrations only).
23:05	7	1x Common pipistrelle	No activity
23:09	6	N/a	No activity
23:14	5	N/a	No activity
23:19	4	N/a	No activity
23:26	3	N/a	No activity
23:31	2	N/a	No activity
23:34	1	N/a	No activity
23:35	Survey End	-	-

Table 5: 17th September 2019 - Dusk Bat Activity Transect Results

Time	Location (see Fig 2)	Species	Notes
17th September 2019			
19:41	5	Common pipistrelle	pass
19:43	5	Common pipistrelle	pass
19:46	6	Noctule	Unseen
19:51	7	Soprano pipistrelle	Pass
19:53	7	Common pipistrelle	Very faint call, unseen
19:55	Walk between stop 7 & 8	Common pipistrelle	Pass
19:56	Walk between stop 7 & 8	Common pipistrelle	Pass
20:01	Walk between stop 7 & 8	Myotis	Pass
20:02	8	Soprano pipistrelle	Pass
20:17	2	Noctule	Unseen
20:28	Walk between stop 3 & 4	Common pipistrelle	Pass
20:30	4	Common pipistrelle	Pass
20:31	4	Pipistrelle species	Pipistrelle social call
20:33	Walk between stop 4 & 5	Common pipistrelle	With social call
20:34	Walk between stop 4 & 5	Common pipistrelle	With social call
20:36	5	Common pipistrelle	Pass
20:37	5	Common pipistrelle	Pass
20:40	Walk between stop 5 & 6	Common pipistrelle	Pass
20:40	Walk between stop 5 & 6	Myotis	Pass
20:42	Walk between stop 5 7 6	Myotis	Pass
20:52	6	Myotis	Pass
21:00	7	Common pipistrelle	Pass
21:06	8	Myotis	Pass

4 Discussion and Conclusion

4.1 *Discussion*

The bat surveys described in this report were undertaken to assess the potential impacts of the development on levels of bat activity on and immediately surrounding the application site. The update survey in 2019 recorded similar findings to the previous surveys in 2017.

Bat activity observed during both transect surveys undertaken in May and June 2017 and during the transect survey in September 2019 was moderate with bats recorded throughout the survey site with the exception of the area around the south-western boundary (SLP 1). The majority of bats recorded throughout the duration of the surveys were common pipistrelle with a maximum count of 28 records during the survey undertaken in May 2017. Overall, a maximum count of seven passes /observations of Myotis species were recorded during surveys, with maximum count of one soprano pipistrelle bat and two noctule bats recorded during the 2017 surveys. The majority of bats recorded throughout the duration of the 2019 survey were common pipistrelle with a maximum count of 15 records during the survey. Overall, a maximum count of six passes /observations of Myotis species were recorded during surveys, with maximum count of two soprano pipistrelle bat and two noctule bats recorded during the surveys.

The majority of bat foraging activity was observed towards the southern end of the site between SLPs 4-7, with the highest activity recorded along the southern hedgerow with a maximum of 4 Myotis species and 3 common pipistrelle bats recorded at SLP 5 in May. The majority of the observed bats were flying in close proximity to hedgerow / tree line features.

The low levels of bat activity along the western boundary (SLP 1) in May and June 2017 and September 2019 is attributed to lack of suitable boundary features for bats (boundary is predominantly fencing) and increased human disturbance (e.g. light levels). Conversely, higher activity levels towards the southern end of the site are attributed to reduced human disturbance and prevalent connecting features to the wider area i.e. hedgerows and treelines.

Higher levels of bat activity were recorded during the seven nights the static detectors were deployed. In 2017 five bat species were recorded during the surveys: common pipistrelle, soprano pipistrelle, brown long-eared Myotis species (whiskered / Brandt's) and noctule whereas in 2019 seven bat species were recorded during the surveys: common pipistrelle, soprano pipistrelle, brown long-eared Myotis species (whiskered / Brandt's / Natterer's), noctule Leisler's and serotine.

The total number of bat passes was significantly greater at the southern hedgerow location (location 1 with 546 passes in 2017 and 479 passes in 2019) compared to the central hedgerow that runs north (location 2 with 46 passes in 2017 and 259 passes in 2019). Passes were recorded constantly throughout the duration of the night at Location 2 compared to sporadic registrations recorded throughout the night at Location 1.

In 2017 common pipistrelle was the most abundantly recorded species at both locations 2; although there was a significant higher number recorded at Location 2 (497) compared to location 1 (42). Passes of Myotis species was also higher at Location 2 with 33 passes recorded, compared to one pass at location 1. Similarly, records for brown long-eared were higher at Location 2 (12) compared to Location 1 (one). Two noctules were recorded during the time the detectors were deployed (recorded at Location 1) along with four passes of soprano pipistrelles recorded at location 2.

In 2019 Myotis species indicative of whiskered, Natterer's or Brandt's was the most abundantly recorded species at both survey locations, although the number of passes was much lower at Location 1 compared to Location 2 (89 passes at Location 1 and 235 passes at Location 2). Similarly, passes of common pipistrelle was higher at Location 2 with 192 passes recorded, compared to 89 pass at location 1 and passes of serotine was higher at Location 2 with 2 passes recorded, compared to just one at Location 1. Leisler's was not recorded at Location 2, whereas 16 passes were recorded at Location 1, 18 passes of soprano pipistrelle was recorded at Location 2 whereas 23 were recorded at Location 1. Passes of brown long-eared bats was higher at location 1 with 26 passes recorded, compared to 18 passes recorded at location 2 and passes of noctule was higher at location 1 with 15 passes recorded, compared to 14 passes recorded at location 2.

4.2 *Conclusion*

Overall, levels of bat activity recorded during the transect activity surveys undertaken in May and June 2017 and September 2019 were moderate with common pipistrelle being the most frequently recorded species during the surveys. The majority of activity was recorded between SLP 4-7; towards the eastern and southern sides of the site, although bat activity was recorded throughout the survey area along all vegetative boundary features. The results of the static detector surveys (in relative terms), reflect those of the transect surveys with common pipistrelle being the most abundantly recorded species.

The results indicate that bats use all vegetative features located within and along the boundary of the site. However, the results show that bat activity levels are significantly lower at the central hedgerow location compared to the hedgerow to the south.

It is likely that roosts are located outside of the site, particularly within woodland and the urban area to the west, and that bats are using the connective features, namely the southern hedgerow, to commute to the wider area.

4.3 *Recommendations*

Based on the initial layout plan for the development[4], the scheme will retain the majority of hedgerows and trees within and bounding the application site, with the only section of hedgerow loss being in the centre of the site. The transect surveys and static detector data indicate that the removal of the hedgerow is likely to have a negligible impact on bats. It is recommended that the southern hedgerow is retained and gaps filled using British native species and preferably of local provenance to provide biodiversity gains in the long term. Species could include blackthorn, elder, hazel and holly.

If any trees are to be removed, it is recommended that either of the following options should be adopted for the felling of any trees with 'low' bat roost potential detailed in the Ecology Report.[1]

- Soft-fell the trees during March-May or September-October (avoiding the main bat maternity and hibernation periods). Where possible soft felling should also avoid the bird breeding season (March – August inclusive). The trees should be cut in sections to be gently lowered to the ground and left for 24 hours to enable bats (if present) to escape. Any cavities/crevices must be brought down intact (not sawn through). Cut sections will be inspected for bats prior to removal from site (if bats are found work must cease and a bat licenced ecologist must be consulted for advice). Or;
- Undertake a bat inspection survey of each tree using a bat licensed tree-climber prior to felling in order to confirm the presence/ likely absence of bat roosts at the time.

<u>Ecological Mitigation and Compensation Strategy.</u>

Measures to increase the foraging and roosting opportunities on site should be detailed within an Ecological Mitigation and Compensation Strategy (to be produced when a detailed design plan for the development is available). This document should include the provision of bat boxes in the trees, bat bricks in the buildings and the inclusion of dark foraging corridors with consideration on artificial lighting.

<u>Habitat Enhancement for Bats</u>

The development includes provision of space for a soakway/pond (north-eastern part of site) and it is recommended that this is incorporated into the scheme along with new tree and hedge planting and wildflower meadows. Such habitats and features will benefit bats.

There may be opportunities to enhance the site for bats through the provision of roosting opportunities by installing bat boxes on mature trees and bat bricks in the properties. Recommended bat box designs include the Schwegler 1FD. The fixed position for bat boxes/bricks should be

[4] Clendon Architecture. 24.05.17. Proposed Indicative Block. Leek. Drawing no: CAL030517

located at least 5 metres high on trees/buildings and located away from light spill. Bat boxes/bricks should face between east, south and west (not north).

Lighting

Artificial lighting can cause disturbance to bats; it is therefore recommended to avoid/minimise external lighting in close proximity to any existing treelines/hedgerows within or adjacent to the development. A wildlife sensitive lighting strategy should be produced at the detailed design stage for the scheme. This should be in accordance with Bats and Lighting in the UK; Bat Conservation Trust; Version 3, May 2009.

Appendix 1: Legislation

Bats

All British bat species are fully protected through The Conservation of Habitats and Species Regulations 2010 as European Protected Species (EPS). They also receive some protection through inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

It is an offence to deliberately capture, injure or kill a bat. It is an offence to damage or destroy a breeding site or resting place of a bat. It is an offence to deliberately disturb a bat; in particular any disturbance which is likely (a) to impair their ability - (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or (b) to affect significantly the local distribution or abundance of the species to which they belong.

Under the Wildlife and Countryside Act 1981 (as amended), it is also 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 obstruct access to any structure or place which any such animal uses for shelter or protection.

The 'appropriate authority' (Natural England in England) has powers to issue licences for various purposes including - (a) scientific or educational purposes… and (e) preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment. The appropriate authority shall not grant a licence under this regulation unless they are satisfied - (a) that there is no satisfactory alternative, and (b) that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range. It is an offence for any person authorised by virtue of a licence to which this paragraph applies to contravene or fail to comply with any condition which the licence requires him to comply with.

Several species of bat including brown long-eared and soprano pipistrelle *Pipistrellus pygmaeus* are identified as UK Biodiversity Action Plan (BAP) priority species.

Appendix 2: Design Plans



INDICATIVE SITE LAYOUT

The scaling of this drawing cannot be assured

Revision	Date	Drn	Ckd
-	-	-	-

Project
Leek
Staffordshire

Drawing Title
Indicative Site Layout

Date	Scale	Drawn by	Check by
16.09.19	1:1250@A3	JC	TP

Project No	Drawing No	Revision
CAL030517	04	-

CLENDON ARCHITECTURE

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