Land off Darton Lane, Mapplewell

Bat Activity Survey

15/09/2023

Report Ref. ER-6517-03-A

Report reference	**ER-6517-03-A - Bat Activity Survey**
Author	Victoria Baker BSc (Hons) MSc MCIEEM Senior Ecologist
Technical Review	Sam Kitching BSc (Hons) MCIEEM Principal Ecologist
QA	Joanna Bertwistle BSc (Hons) ACIEEM Ecologist
Authorised	Sam Kitching BSc (Hons) MCIEEM Principal Ecologist
Date	15/09/2023
Report duration	In accordance with CIEEM (2019), unless otherwise stated the findings of this report remain valid for a period of 18 months. After this period advice should be sought on the scope of any updating work required.

Summary Statement

A series of Spring, Summer & Autumn activity surveys have found the Site's interior to attract only a limited range of common bat species at low to moderate levels.

With the Site being linear and running parallel to an off-site, tree'd railway line, it is assessed that at least some of the activity recorded within the site is in association with this feature. However, the rough grassland and scrub habitats are likely providing a good source of invertebrate prey.

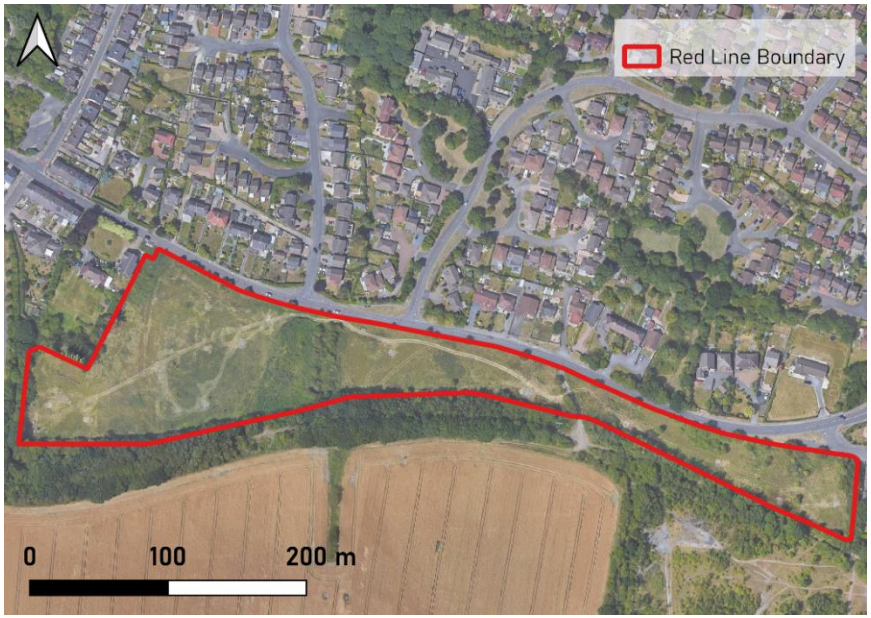
A sensitive masterplan has been devised which retains an area of grassland to the west and incorporates new habitat areas, thus maintaining the sites connective function, and continuing to provide foraging opportunities.

It is recommended that a sympathetic lighting plan be produced to ensure new and retained habitats on and off Site remain dark and unlit.

Introduction

1. Brooks Ecological was commissioned by Duchy Homes to carry out detailed Bat Activity Survey at the proposed development Site at Land off Darton Lane, Mapplewell (grid ref. SE 3197 0985).
2. These surveys are required to provide evidence of the baseline use of the Site by the local bat population, which will enable mitigation and enhancement strategies to be devised to support a planning application.
3. The scope of the survey has been devised based on an assessment of the habitats present, and in accordance with current best practice guidelines (Bat Conservation Trust, 2016).

Figure 1 Site location plan.



Method

4. Surveys were directed by Victoria Baker BSc (Hons) MSc MCIEEM. Victoria has over 9 years' experience of carrying out bat surveys in a professional capacity and is registered to use the Class Survey Licence WML CL18 (Bat Survey Level 2).
5. The objective of the survey was to collect information on the Site's use by local bat populations, so that an accurate assessment of the potential impacts of development could be made. A transect and remote monitoring survey was carried out to collect the following data (Bat Conservation Trust, 2016):
    - The assemblage of bat species using the Site
    - The relative frequency with which the Site is used by different species
    - The nature of activity for different bat species, for example foraging, commuting, and roosting

Survey Conditions

6. Walked transects were undertaken in May, July and September 2023 during optimal survey conditions. Survey conditions are summarised below:

Table 1 Survey conditions.

Survey	Date	Sunset	Weather	Invertebrate Activity
Spring	11/05/2023	20:53	12°C-10°C, 50% cloud, dry, low wind (B1).	Low
Summer	03/07/2023	21:37	13°C-12°C, clear skies, dry, low wind (B1).	Moderate
Autumn	06/09/2023	19:45	23-21°C. part cloud. Still/ light breeze (BO/B1).	High

Transects

7. Transects began around sunset and continued up to two hours after when all bats were thought to have emerged, and thus were actively foraging and commuting.
8. The transects were walked by a team of two surveyors, equipped with a heterodyne detector as well as a Titley Scientific Anabat Express, used to track the transect route and aid species identification.

Remote Monitoring

9. To supplement data collected during the walked transect, a static monitoring device (Wildlife Acoustic SM4) was deployed in a strategic location on-Site prior to the start of the walked transect.
10. Data collected during the period of remote monitoring has been run through Kaleidoscope Pro software, which can identify bat calls down to species level (except for *Myotis* spp.). Identification is generally correct when using this software; however, results are double checked to ensure accurate data analysis.
11. Every effort is made to split up myotid calls down to species level. This is done by analysing calls on Analook software and looking at parameters such as inter-pulse interval, call duration, slope, and maximum/minimum/peak call frequency. However, this can often be difficult when registrations are short in duration, faint, or distorted by cluttered environments.

Limitations

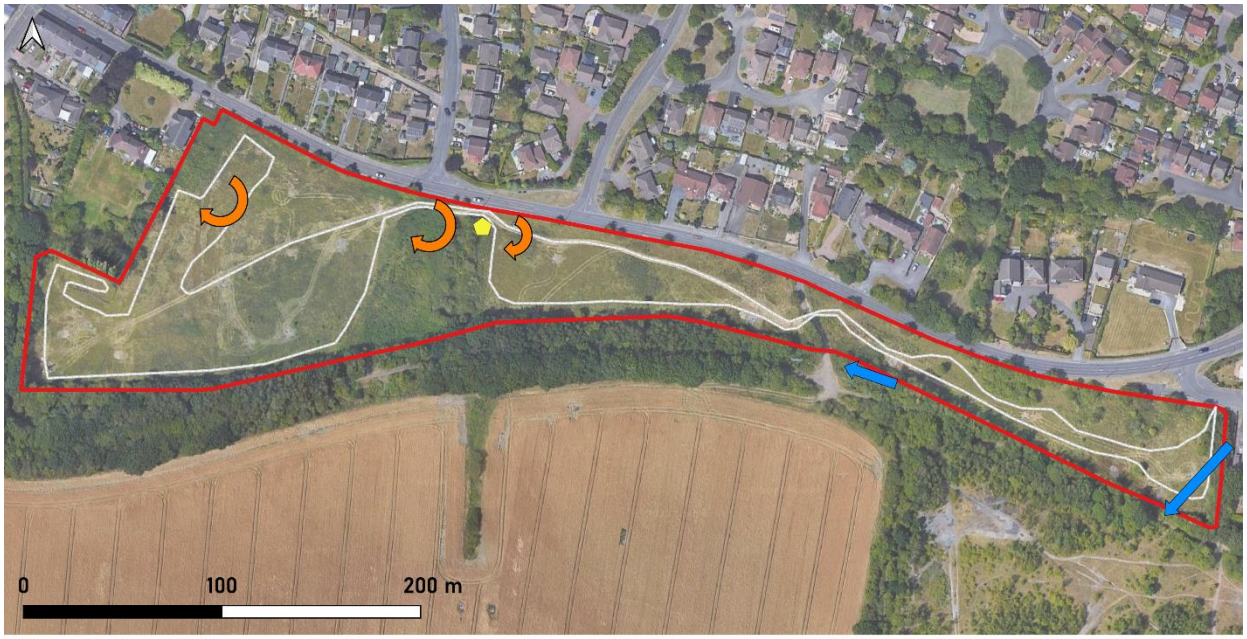
12. Static monitoring can only reliably provide information on what species of bat are regularly making use of a site. More detailed information on bat activity, such as frequency of bats and nature of activity (foraging, commuting, flight path) can only be gleaned through walked transects.
13. The frequency of calls recorded can, to some extent, suggest whether activity on-Site is low, moderate, or high, by comparing data collected with that of similar sites that have been surveyed.
14. A single registration can account for up to 15 seconds of continuous bat call. Large batches of registrations can be interpreted in several different ways: for instance, a single bat foraging continuously for only an hour can result in many hundreds of registrations being logged; similarly, many hundreds of bats commuting quickly past the detector can result in the same number of registrations.

Spring Results

Walkover Transect

15. The transect began in the north-east corner of the Site and headed west, before circling the Site in an anti-clockwise direction. The route was walked twice.
16. Five bat contacts were logged during the walked transect. The first was at 21:35, 42 minutes after sunset when a common pipistrelle was recorded commuting across the eastern end of the Site.
17. The second bat contact was at 21:38 when a common pipistrelle was heard but not seen, likely commuting along the woodland off-Site to the south.
18. Following this, activity related to single common pipistrelles foraging to the west at 22:29, 22:35 and 22:42- these are likely to have been the same bat recorded on different parts of the transect.
19. No other species were recorded either by the surveyor or by the Anabat Express.

Figure 2 Summary of bat activity observed during the Spring walked transect.



Spring Results

Remote Monitoring

20. A single remote detector (Song Meter SM4BAT FS) was deployed in the location shown in Figure 2. This was left to run for five consecutive nights, from 6th-10th June 2023. The spring period (April–May) could not be sampled due to repeat failing of recording equipment; data collected in early June was used in its place and this is not thought to be of significance to the overall Spring assessment.

21. Activity was generally consistent across the monitoring period, averaging 123 bat registrations per night- this equates to low bat activity. Lowest numbers were recorded on the first night of recording, the 6th, with 74 registrations; highest levels were recorded on the final night, the 10th, with 158 registrations. These figures generally indicate very low activity by bats.

22. The most frequent species were common pipistrelle and Leisler's bat, accounting for 74% and 23% of records respectively. The remaining records were of noctule, brown long-eared bat, and soprano pipistrelle, indicating that these species are less common in the local environment, or have less reliance on the Site for foraging and/or commuting.

23. Activity for all species peaked in the two hours after sunset, with a smaller peak in the two hours before sunrise; such an activity pattern generally indicates the presence of bats leaving and returning to roosts in the surrounding area.

24. Lower levels of activity were fairly consistent throughout the night, indicating that single or very low numbers of bats use the Site (or nearby Off-Site habitats) as a foraging resource.

Table 2 Total number of registrations logged for each bat species, per night across the spring period.

Species	6th June	7th June	8th June	9th June	10th June	Average
Common pipistrelle	62	60	81	126	127	91
Leisler's bat	8	41	43	25	24	28
Noctule	2	1	0	0	4	1
Brown long-eared bat	2	3	0	0	0	1
Soprano pipistrelle	0	1	0	1	3	1

Figure 3 Number of registrations per species over the spring monitoring period.

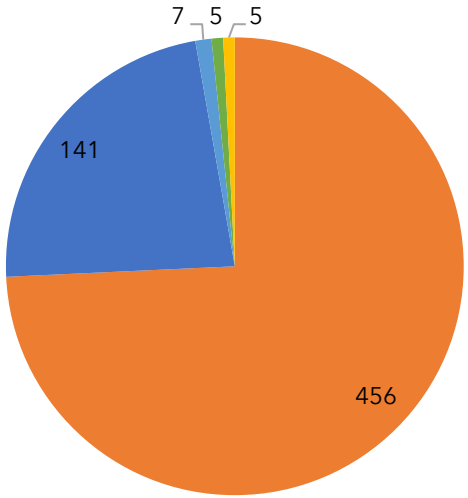
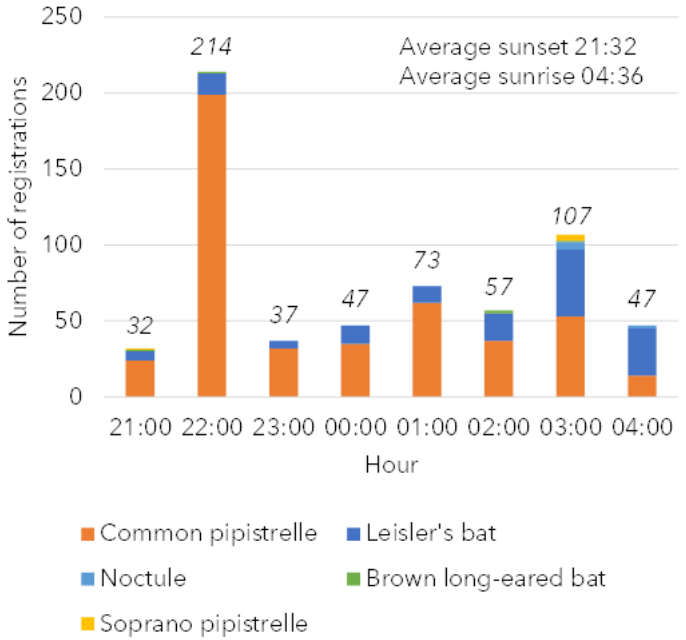


Figure 4 Number of records per hour over the spring monitoring period, divided by species. Callouts indicate total number of registrations made in an hour for all species.



Summer Results

Walkover Transect

25. The transect began in the north-east corner of the Site and headed west, before circling the Site in an anti-clockwise direction. The route was walked twice.
26. Bat activity was slightly higher then Spring, but the vast majority of bat contacts still relate to common pipistrelle.
27. Bat activity began at 22:08, 31 minutes after sunset when a single common pipistrelle was recorded commuting over the centre of the Site north – south.
28. Following this, bat activity comprised of single, occasionally 2 common pipistrelles foraging around the western portion of the Site. Due to the Site's relatively small nature, it is likely that some of these bats were encountered multiple times.
29. In addition, a noctule was recorded at 22:24 commuting over the north-western corner of the Site.
30. No other species were recorded either by the surveyors or by the Anabat Express.

Figure 5 Summary of bat activity observed during the Summer walked transect.

Summer Results

Remote Monitoring

31. A single remote detector (Song Meter SM4BAT FS) was deployed in the same location as before and left to run for five consecutive nights, from 4th–8th July 2023.

32. Activity was generally consistent across the monitoring period, averaging 647 bat registrations per night. Lowest numbers were recorded on the final night of recording, the 8th, with 524 registrations; highest levels were recorded on the night of the 5th, with 774 registrations. These figures indicate relatively consistent, moderate bat activity levels on-Site.

33. Common pipistrelle was by far the most common species recorded, accounting for 93% of all registrations. Leisler's bat formed a much smaller proportion than in spring, with 5% of registrations; noctule and soprano pipistrelle are much less frequent, as in spring. Brown long-eared bat was not recorded over the summer period, although a single registration of Nathusius' pipistrelle was made.

34. As in spring, activity peaked in the two hours following sunset, and again in the hour preceding dawn, lending further support to the hypothesis of a roost being present nearby.

35. Activity dropped off strongly throughout the night. Compared to the consistent activity levels through the spring monitoring period, this indicates a reduced reliance by bats on the Site in summer.

Table 3 Total number of registrations logged for each bat species, per night across the summer period.

Species	4th July	5th July	6th July	7th July	8th July	Average
Common pipistrelle	544	763	659	565	487	603
Leisler's bat	39	11	55	22	25	30
Noctule	6	0	35	9	12	12
Soprano pipistrelle	0	0	0	3	0	<1
Nathusius' pipistrelle	0	0	1	0	0	<1

Figure 6 Number of registrations per species over the summer monitoring period.

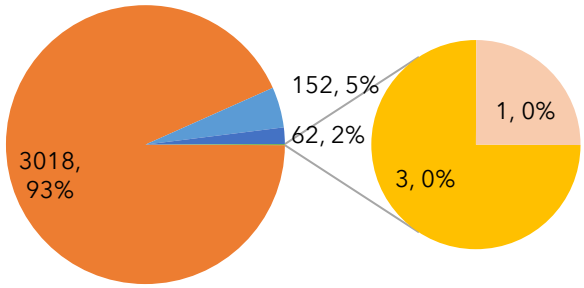
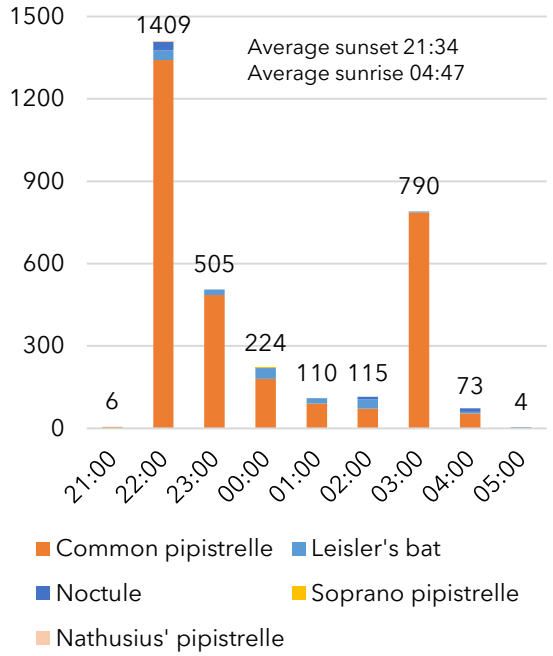


Figure 7 Number of records per hour over the summer monitoring period, divided by species. Callouts indicate total number of registrations made in an hour for all species.



Autumn Results

Walkover Transect

36. A similar route to that followed in spring and summer was repeated here. The transect began in the north-east corner of the Site and headed west, before circling the Site in an anti-clockwise direction. The route was walked twice.

37. Bat activity was considerably lower than that seen in summer, with only a handful of bat contacts being recorded.

38. The first contact was logged at 20:23, when a solitary common pipistrelle bat was recorded foraging around scrub and former waterbodies within the northeastern corner of the Site.

39. The next contact was logged at 20:37 in the northwestern end of the site, with a common pipistrelle heard but not seen, most likely attributed to foraging activity within neighbouring gardens to the north. This bat was later seen on a subsequent lap of the site at 21:05 foraging over gardens in the same location.

40. The finial activity logged was back towards the eastern end of the Site, with a solitary common pipistrelle and soprano pipistrelle bat recorded foraging together over tree lines and surrounding gardens. This activity was recorded for only a few minutes between 20:57 and 21:00, with both bats dispersing out into surrounding habitat.

41. Despite optimal survey conditions, bat activity recorded during this transect was very low, and indicates that local bat populations are unlikely to have any dependence on the site as a key foraging resource at this time of year.

Figure 8 Summary of bat activity observed during the Summer walked transect.

Autumn Results

Remote Monitoring

42. A single remote detector (Song Meter SM4BAT FS) was deployed in the roughly the same location as previous surveys and left to run for five consecutive nights, from 6th–10th September 2023.

43. During this period, bat activity can be described as being very low, with the average number of registrations logged per night being less than 40 for all bat species.

44. Up to seven species of bat were recorded, with common pipistrelle accounting for the bulk of this activity. However, with only an average of 20 registrations logged per night, this still accounts for only very low levels of activity.

45. Noctule and leisler's were recorded on most nights, but with an average of only 4 and 5 registrations respectively, this activity accounts for only brief passes over the site by single or low numbers of individuals of these two species.

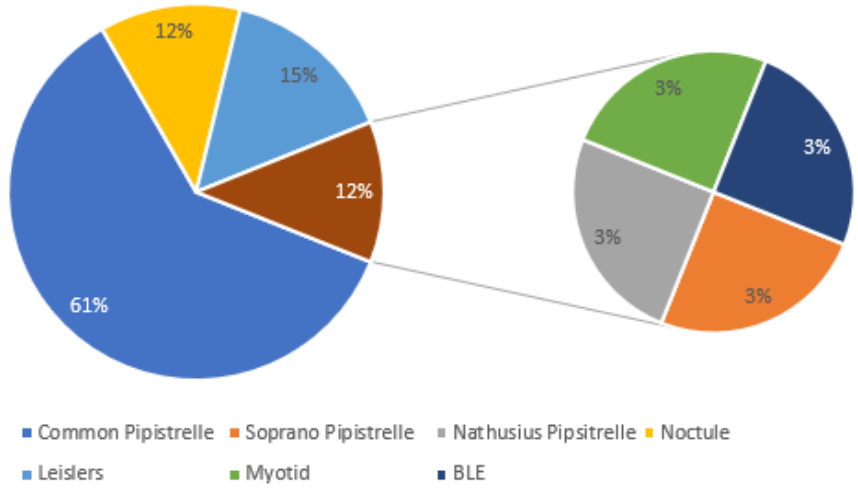
46. The other four species were recorded at very low levels on only one or two evenings, which can be interpreted as solitary bats passing quickly through the site.

47. From the data collected, it is reasonable to conclude that no local bat populations have any real dependence on the site as a foraging resource during the autumn period. This corroborates findings of the walked transect.

Table 4 Total number of registrations logged for each bat species, per night across the summer period.

Species	6th Sept.	7th Sept.	8th Sept.	9th Sept.	10th Sept.	Average
Common Pipistrelle	22	20	28	17	15	20
Soprano Pipistrelle	3	1	-	-	-	<1
Nathusius Pipistrelle				1	-	<1
Noctule	5	2	1	7	5	4
Leisler's	8	4	12	-	3	5
Myotid				2	-	<1
BLE	1	-	-	-	3	<1

Figure 9 Proportion of registrations attributed to each bat species over the autumn monitoring period.



Evaluation

48. Seasonal bat activity survey, comprising walked transects and remote monitoring within May, July and September 2023 have found the Site to be of relatively limited value to local bat populations.

49. Spring and autumn surveys recorded only low levels of bat activity during both walked transects and remote monitoring with the bulk of bat activity being attributed to common pipistrelle. This is likely to be attributable to small numbers of bats, and the Site is unlikely to be of importance to the local common pipistrelle population during these periods.

50. Other species recorded in order of abundance comprised Leisler's bat, noctule, soprano pipistrelle, brown long eared and Nathusius pipistrelle- a group of species that is typical of the urban / farmland fringe. These were all recorded at very low levels, indicating small numbers of bats passing through the Site, rather than having any dependence on it as a foraging resource.

51. As would be expected, summer surveys recorded slightly greater levels of bat activity, but with common pipistrelle again accounting for most of this (circa 93% of all registrations attributed to this species). The Site is therefore likely to be of value to small numbers of common pipistrelle during this period. All other bat species were again recorded at very low levels, indicating that none of these species have any dependence on it as a foraging resource.

52. Although no significant commuting activity was noted, the Site clearly contributes to the network of green corridors locally, and it must therefore be considered to have a role as a community corridor for local bat populations.

Recommendations

53. Under current proposals, development will be limited to the smaller central and eastern fields, with large parcel of land within the western field being retained and used for the creation of POS. It is recommended that as much of the existing grassland vegetation in this area be retained in situ as possible and enhanced through better management.

54. New mixed native scrub vegetation, along with tree & hedgerow planting could then be introduced to create a more varied and structured community, which would lead to a greater diversity / abundance of invertebrate prey.

55. If feasible (depending on long term management requirements) any new SUDS basin should planted-up with wet grassland / marginal vegetation, to create a more diverse and naturalist wetland/ waterbody.

56. The vegetated railway line to the south is situated off site and will therefore not be directly impacted by development. However, measures should still be put in place to avoid/ minimise any indirect impacts; this could be delivered through a CEMP: Biodiversity.

57. A sensitive lighting plan should also be produced, by a suitably experienced lighting professional, which demonstrates how light spill will be avoided / minimised along the off-site railway line and onsite POS.

58. Based on the data collected, and through the retention and creation of onsite habitats / offsite railway line, it is assessed that the proposed development is unlikely to impact significantly on any local bat populations.

<u>Enhancement</u>

59. The Site currently lacks any potential roost features; introducing a range of integral and tree mounted bats within new buildings and retained trees would provide a gain for local bat populations. A target of at least 25% of new builds supporting integral bat boxes should be set.

References

BS:42020 2013. Biodiversity - Code of practice for planning development. BSI

Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists – Good Practice Guidelines

Conservation of Habitats and Species Regulations 2010 http://www.legislation.gov.uk/uksi/2010/490/contents/made

CIEEM (2019) Advice Note - On the Lifespan of Ecological Reports and Surveys

English Nature (2004) Bat Mitigation Guidelines. English Nature, Peterborough.

Institute of Lighting Professionals (2018) Bats and artificial lighting in the UK. Bat Conservation Trust Guidance Note 08/18.

https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

JNCC (2004) The Bat Workers Manual. 3rd Edition.

ODPM circular 06/05 (2005) Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System
http://www.communities.gov.uk/publications/planningandbuilding/circularbiodiversity

Wray S, Wells D, Long E, Mitchell-Jones T (2010) Valuing Bats in Ecological Impact Assessment. CIEEM In Practice.