

Leicestershire and Rutland

Bats and Lighting

Leicestershire County Council Planning Ecology Service

November 2014, updated August 2022

This guidance note covers the impacts of small-scale lighting on bats' foraging activity – such as that arising from lighting of sports grounds, public open spaces, small industrial sites and recreational areas. It does not cover the impacts of lighting associated with large-scale projects, such as new roads, large industrial developments, etc.

It does not cover the impacts of lighting on bats' roosting behaviour, including emergence from roosts. This is a separate issue – however it should be noted that lighting levels within a roost space or on a roost emergence point should never be increased beyond that to which the bats are accustomed; and that some bats require almost complete darkness before emergence.

1. Impacts of lighting on bats' foraging

Foraging

Most species of bat forage along habitat features and wildlife corridors – e.g. watercourses, canals, woodlands, rows of trees, parkland, hedgerows, scrub, etc. Some species will not use foraging routes if these become lit, and a lit-up section of the foraging route can be a barrier that bats will not cross. *Myotis* species (e.g. Daubenton's, Whiskered, Natterer's) and Long-eared Bats are known to be particularly sensitive. (ref: Table 5.2 of Stone (2013)⁵)

These species of bat are relatively frequent in Leicestershire, and this note assumes that most suitable habitats will be used by bats for foraging, at some stage in the year or their life-cycle. To establish patterns of bat usage is burdensome, requiring a series of surveys throughout the year, and it would not be a reasonable requirement for small-scale developments, and our policy therefore is to avoid impacts through lighting design.

Maximum light levels

Although the potential adverse on some species of bats are well documented, there is very little research on the actual levels of light that inhibit normal foraging behaviour. Matt Emery (2008)¹ reports that some species are inhibited by as little as 0.06lux (see page 13 of his report) but the source of this figure is not given. Alison Fure (2006)² reports that level of more than 1lux prevent Daubenton's bats from emerging. Emma Stone (2013)⁵ summarises some evidence in her report (Table 5.1).

LRERC has adopted 1lux as the precautionary maximum amount of light spillage on to a bat foraging corridor needed to avoid impacts on bat foraging.

2. Mitigating Impacts

2.1 Light spillage and lighting plans ('isolux' plots)

Light spillage can be minimised by (for example) adjusting the position and height of the lighting columns; by fitting baffles to the sides, rear and top of lamps; use shields or masking, fitting louvres to the lamp; by adjusting the angle of the lamp. Impacts are reduced by using low or high pressure Sodium lamps instead of Mercury or metal halide. White LED lights reduce lighting impacts further, and may be suitable for lighting footpaths, etc.

Lighting must not spill onto habitats that could be used by bats for foraging. If lighting is proposed close to one of these habitats, there is a potentially serious impact on bats' foraging activity, which could affect the local bat population significantly. In these cases, the applicant will need to provide a plan showing the impact of the proposed lighting.

The plan or 'isolux plot' should show the extent of the habitat feature (i.e. the spread of a tree canopy, not the trunks of trees), the position of lighting columns and the 1, 2 and 5lux levels around the lighting columns, at 2 metres above ground.

2.2. 'Switching-off' times and curfews

Bats emerge from their roosts and start foraging at dusk (approximately 30 minutes after sunset). Impacts on bats can therefore be reduced by restricting the times at which lights can be switched on.

- During winter (November to March) bats are usually hibernating, so there is no restriction on lighting times.
- During the summer months, bats emerge later and it is likely that floodlighting, sports lighting etc will not be needed anyway.
- Impacts on bats are higher in the April/May and September/October time periods, when bats emerge earlier when most lighting will be on. The impact on bats is increased after mid-October when we change from British Summer Time by subtracting an hour.

The table below shows recommended 'switch-off' times for lights during the active bat season.

Month	Switch-off
March GMT	18.30
March BST	19.30
April	20.30
May	21.15
June	21.45
July	21.30
August	20.45
September	19.45
October BST	18.45
October GMT	17.15

Note: the above times have been derived by taking the average of the sunset times on the first and last days of the month, adding 30 minutes, and rounding up to the nearest 15 minutes.

The use of automatic or token-operated time-switches is recommended.

Security lighting should be on an intruder switch so they are not on permanently over night.

3. Bat surveys

If a satisfactory lighting plan or acceptable curfew can be agreed as a planning condition, bat surveys are not needed.

Applicants who cannot minimise light spillage on a bat foraging habitat to the required 1lux or cannot accept a curfew will be required to demonstrate that there is no impact of the proposal on bats, by carrying out a programme of bat surveys. Survey reports must be submitted upfront with the application.

2 remote bat detectors (e.g. 'Anabat'), placed on or along the bat foraging habitat or corridor

- 2 consecutive weeks in April, May, June or September,
OR
- 1 week in July or August

PLUS

- 2 bat activity surveys of the corridor/feature in one month, using a handheld bat detector, in April, May, June or September,
OR
- 1 bat activity survey of the corridor/feature using a handheld bat detector in July or August

The remote surveys will detect overall level of use by all species.

The use of two remote detectors will highlight any variation in bat activity

The bat transect survey will reveal numbers of individual species and directions of flight.

Surveys must be done in suitable weather conditions – if weather conditions deteriorate, the time period for remote recording should increase accordingly.

This is a minimum survey requirement. If risk to bats is considered to be high, survey requirements will increase. Recommended survey levels for high-impact schemes are given in Stone (2013)⁵, in Chapter 4.

4. Advice to planning authorities

Surveys for bats should be submitted upfront with an application, in accordance with the ODPM Circular 06/05.

LRERC will recommend refusal of applications in these circumstances:

- If it is not possible to reduce the impact of the lighting on a potential bat foraging route or area to below 1lux, and no bat activity or emergence surveys have been submitted;
- If it is not possible to reduce the impact of the lighting on a potential bat corridor to below 1lux, and a bat activity survey has been submitted showing significant use by bat species known to be sensitive to light levels;
- If it is not possible to agree a lighting curfew to protect a bat foraging corridor.

LRERC will not recommend refusal of applications in these circumstances:

- A isolux plan showing that light spillage on the potential bat foraging route or area is lower than 1lux at 2m above ground has been submitted;
- A satisfactory curfew has been agreed;
- bat activity surveys show that use of the corridor is not significant, or is by a bat species known to be tolerant of light levels.

LRERC will recommend that mitigation measures outlined in section 2 above are the subject of planning conditions.

LRERC will always recommend minimising light spillage on natural features, through mitigation measures outlined in 2.1 above.

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References

1. Emery, M. (2008) *Effect of Street Lighting on Bats*. Urbis Lighting
2. Fure, A. (2006) *Bats and Lighting*. The London Naturalist, 85.
3. Bat Conservation Trust Guidance note 08/18 (2018) *Bats and Artificial Lighting in the UK*
<https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?v=1542109349>
4. The Institution of Lighting Engineers. (2021) *Guidance note 1 for the Reduction of Obtrusive Light*.
<https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/>
5. Stone, E.L. (ed.) (2013) *Bats and Lighting: Overview of Current Evidence and Mitigation*. Bats and Lighting Research Project, University of Bristol