



## Monitoring Light levels for Lesser Horseshoe Bats

Lesser horseshoe bats typically follow linear features such as tree lines or mature hedgerows when they emerge from their day roosts at dusk to fly to their woodland foraging grounds. It is thought that the bats seek the shadows beneath the foliage to avoid the attentions of birds of prey. Open gaps in these commuting routes can cause bats to delay their flight until full darkness has developed later in the night. However, this means that valuable foraging time is lost both at dusk and as dawn approaches when bats must return sooner to their roost than they otherwise would. This can make the difference



Fig. 1. Skye DataHog set up in field with light sensor and temperature/relative humidity sensor

between life and death for offspring as their development may be slow if mothers cannot get enough to eat in the foraging time available. Youngsters that survive but are undernourished are unlikely to survive the winter when food is naturally scarce as they must then survive off their fat reserves during hibernation.

The Countryside Council for Wales (CCW) wanted to understand more about the effect of light on the way bats behave at open gaps in their commuting routes. CCW commissioned Smith Ecology Ltd. to carry out a study at a lesser horseshoe bat breeding roost in the Brecon Beacons National Park. Smith Ecology in collaboration with Just Mammals Consultancy used a Skye Instruments DataHog to record ambient light levels measured with a Skye lux sensor from sunset to sunrise each night (Figs 1 & 2). Temperature was also recorded. It was found that bats avoided crossing gaps until light levels had dropped to 6 lux or darker. With ambient light above 3 lux they flew close to an un-vegetated river bank, apparently making the most of the cover that this could offer. Only at light levels of 1 lux or darker were the bats

observed commuting and foraging in the open away from cover. This compares with full darkness measuring about 0.2 lux during the survey nights. The ability of the Skye equipment to measure light across the range of interest, from 1000 lux down to 0.1 lux and to record the values at one minute intervals (readings were actually taken every 10 seconds and averaged over each minute) was crucial to the success of the study.

Further work is required, but it appears that ambient light level has an influence on the commuting behaviour of lesser horseshoe bats. Gaps in cover from trees etc. on commuting routes, especially near to roosts, may delay bats' access to their woodland foraging areas. The effect may impact on the sustainability of some lesser horseshoe bat populations. This will need to be taken into account during habitat management in areas supporting such roosts.

*Thanks to Dr. Peter Smith for sending us this article.*

### The Equipment

The Skye lux sensor used to measure these low light levels was one of the HOPL amplified range, scaled for extra sensitivity at very low lux levels. Accurate measurements of less than 0.01 lux are possible using these sensors with a high resolution datalogger such as the DataHog2 or SpectroSense2+ meter.

Air temperature was measured using a probe fitted inside a radiation screen for shading (set of white dishes in the photo above), also connected to the same DataHog2 logger.

*Further details can be found on our website at [www.skyeinstruments.com](http://www.skyeinstruments.com)*

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