

Short Review of Bat Activity Report 6.9

Para 1.3.3 – How was building roost potential assessed without visiting buildings adjacent to the DCO? What was the definition of “significant gap”, was this consistent at all locations on the route?

Para 1.3.13 – This paragraph is incorrect. The “Crest Advantage” setting is not implemented on the SM4BAT detector, it is available on a different brand of detector, the Batlogger series manufactured by Elekon AG. Why is there any confusion about the hardware used for detection? Was this represented to Natural England?

Para 1.3.16 – In the user guide for Kaleidoscope, the developers state :

“Kaleidoscope Pro can be used to analyze recordings of bat calls for the purpose of automatic species identification.

Automated identifications, though largely accurate, should not be relied on solely as a basis for scientific research or land management decisions.

It should be expected there will be false positive and false negatives identifications. Because bats use echolocation for navigation and hunting, they adapt their calls in real time to respond to their situation (e.g. hunting insects and avoiding collisions). Additionally, individual species of bats can display extremely variable repertoires of call types, and some calls of some species are very difficult to differentiate from calls that can be produced by other species.

The automatic identification function is intended only as a suggestion to facilitate analysis, not to replace human expert vetting of calls.”

The use of automatic identification, the limited “quality control” sample checking and the subsequent analysis of quantities of calls by species in the report is inconsistent with this warning. There are no metrics provided to estimate the proportion of erroneously tagged recordings.

Para 1.3.16 – The Autold function can be set to one of three levels of sensitivity “More Sensitive”, “Balanced” and “More Accurate”. These have a critical impact on the performance of the tool. “More Sensitive” is biased towards separating a signal from background noise but will also incorrectly tag species to the signal more frequently. “More Accurate” will correctly tag species more frequently but will incorrectly tag more recording as noise without isolating a valid signal. It is not stated anywhere which of these settings was chosen for the analysis and the rationale informing the choice.

Para 1.3.17 – Did the agreement with Natural England include an expectation for multiple recorders to be used at each site? The result in the paper used to support the metric for identifying Barabstelle roosts in the agreement was derived from the use of grids of static recorders arranged within single pieces of woodland. Quoting from the papers conclusion :

“The effect of detector density on woodland classification was highly significant for each woodland ($p < 0.001$), with the survey effort required to reliably detect a colony varying depending on the woodland surveyed. Overall, there was a 90% chance of a woodland being correctly identified as having a colony with a density of 0.16 detectors ha^{-1} (Fig. 3). The adjusted- R^2 value for the model was 0.936. When only a single detector within a woodland was selected *via* our random subsampling

approach, we found that there was just a 32% chance of detecting a colony based on the average survey effort.”

Were Natural England made aware that with only single detectors being used in each location there was only a 1 in 3 chance that roost sites would be correctly identified?

Para 1.3.24 – Were the historic record providers asked to confirm that no errors were made when their data was filtered by National Grid to provide baseline information?

Para 1.3.34 – This statement is not correct :

“Wildlife Acoustics gives an 82% TPR for barbastelle species on detectors with balanced recording settings. This means that Kaleidoscope Pro’s AutoID function correctly identifies barbastelle calls at a rate of 82%.”

The TPR was generated by feeding the tool 217 known Barbastelle echolocation calls, in 178 cases it tagged the recording as being a Barbastelle. As the training data for the tool does not include localisation or social calls (which tend to be most frequently expressed near roosts) and there is no metric on the impact of extracting the signal from background noise the correct version of this statement would be “This means that Kaleidoscope Pro’s AutoID function correctly identifies previously known to be barbastelle calls at a rate of 82%”

Even with the stylised training data used to generate the SM4BAT manufacturers TPR data there is significant variation in true positive and false positive proportions by species.

Para 1.4.5 – As previously noted, using a single detector results in only a 1 in 3 chance that the metric agreed with Natural England will correctly identify a nearby roost presence. Are Natural England aware that the discriminatory power of the test as implemented is so poor?

Para 1.5.17 – Given the uncertainty in the accuracy of species identification, the data in Table A8.10.18 is unreliable although it is a critical input to the scheme of mitigation measures set out in Document 6.8 - Environmental Statement Chapter 8 - Ecology and Biodiversity - Clean Version.