

Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors



What is the Australasian Bat Society Inc?

The ABS is a non-profit organisation and is the peak body representing bat conservation and research in Australasia. The ABS membership includes scientists, consultants, wildlife carers and interested individuals.

The ABS actively advocates for the conservation of bats and their habitat. The ABS encourages scientific research on bats and promotes high standards in the study of bats by providing input and advice to relevant government and non-government agencies, industry, landholders and to the general public.

Background to the development of these standards

Bats comprise around 25% of the native terrestrial mammal species in Australia. Field survey methods for bats include both capture techniques (mist nets and bat traps) and remote detection through the use of bat detectors.

Bat detectors offer significant advantages over capture techniques: they can be operated without specialist training, they are non-invasive and they do not require an operator to be present once they are set.

Unfortunately bat detectors also have limitations: the analysis of calls is complex; and not all bat species can be distinguished by their calls.

Senior bat researchers in the ABS have become concerned that many bat surveys, especially those reported in Fauna Impact Studies, were inadequate in terms of the survey effort (i.e. too low a number of detector nights, trap or mist-net nights) and had reliance solely on bat detectors where both capture and detecting techniques were required for adequate survey results.

Especially of concern was the lack of transparency in the identification of bat calls in many reports. Bat call analysis requires considerable expertise as well as good knowledge of the calls for the species in the survey region (usually having access to a regional reference call library). Many reports gave insufficient detail for independent assessment of the quality of call analysis.

The ABS conducted a workshop (that included both researchers and consultants) to develop a set of standards that if followed would improve the quality of bat surveys and allow independent assessment of reports. Given the difficulty of deriving a set of prescriptive instructions for the design of surveys covering all types of surveys and all bat species and habitats, the ABS concluded that the main thrust of the standards would address reporting standards for bat detector results and give some general guidelines for survey effort.

We recommend the adoption of the following standards.



AUSTRALASIAN BAT SOCIETY, INC.

ABN 75 120 155 626

Standards for reporting bat detector surveys

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To whom this applies

Any agency or individual contracting a consultant to analyse bat calls should insist upon these standards as part of the contractual agreement.

Any person analysing bat calls using the Anabat detector system for research, consultancy or other purposes should apply these standards.

Reporting Standards

The ABS recommends that these be applied to impact statements, fauna assessments, survey reports, and research publications where bat detector recordings and call analysis have been used to identify bats.

Essential

The following must be included in the final report:

1. A description of the reference library used in the identification process.
2. Details of the number of detector hours undertaken during the survey.
3. A sample 'time versus frequency' graph of each species identified during the survey. These graphs must be of bats recorded and identified during the survey.
4. For species with similar call characteristics, a written description of the characteristics used to distinguish these species must be included in the methods.

Highly desirable

Inclusion of the following is strongly recommended:

1. An indication of the proportion of calls identified, i.e. the total number of calls processed and the percentage of these that were identified.
2. All the call files from a survey are deposited ultimately with the client or agency.

Additional suggestions on survey effort and methods

The ABS is concerned about the use of inadequate survey methods and insufficient survey effort in some surveys. However, it is difficult to recommend universal standards because each study will have different aims, target different species or bat communities, and will be conducted in different habitats. Conducting surveys for bats is a specialist task, and judgement based on experience is required when designing survey methods and effort.

The ABS suggest the following as a guide for acceptable standards for insectivorous bat surveys, fauna assessments, and research:

1. Since echolocation call analysis can rarely identify all species within a given area, it is important to determine which species could occur in the area prior to any survey, and whether all species (or a target species) are able to be distinguished solely from echolocation calls.
2. For most inventory surveys, capture techniques (i.e. using harp traps, mist nets or other methods where bats can be captured and identified) should be employed in conjunction with detector sampling.
3. Consultants or biologists who have relatively little experience with bat surveys, but who are engaged to conduct them, should contact a bat specialist to discuss the appropriate methods and level of survey effort.
4. Typical inventory survey effort should involve detector deployment for at least three complete nights in each major habitat type in the survey area.
5. Surveys should be conducted during the warmer months of the year and in good weather conditions.
6. Where possible, reference calls should be recorded from bats released during a survey.

To follow is an example of an acceptable presentation of the essential components for a detector survey report (*see overleaf*).

Identification of echolocation call sequences recorded at Example Creek

Reference library

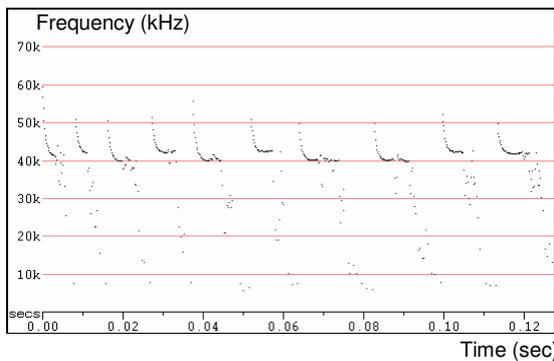
Calls were identified using a library consisting of 250 reference calls from the Example Creek area, 1300 reference calls from the wider Illustration region, and the Smith (2000) regional bat call identification key.

Survey effort and identification rate summary

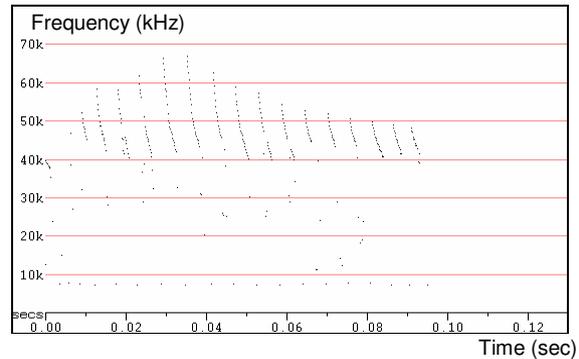
A total of 4000 call sequences was recorded at 6 sites over 3 nights. Of these, 1500 (35%) of the sequences could be identified confidently to species or genus level (see Table x). All calls recorded are stored on the CD attached to this report.

Example sequences

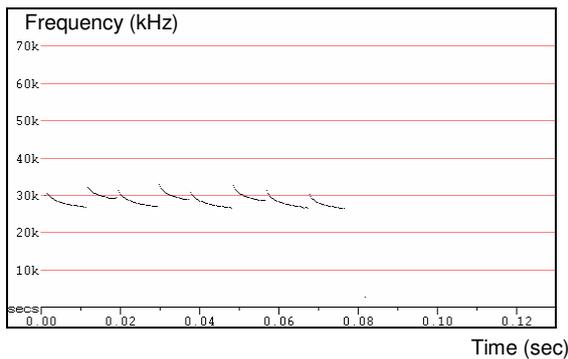
The calls of three species were identified from the Example Creek recordings. Additional calls were identified belonging to bats of the genus *Nyctophilus*, however these could not be identified to species as the calls of all three *Nyctophilus* species that occur in this area overlap almost entirely in most characteristics.



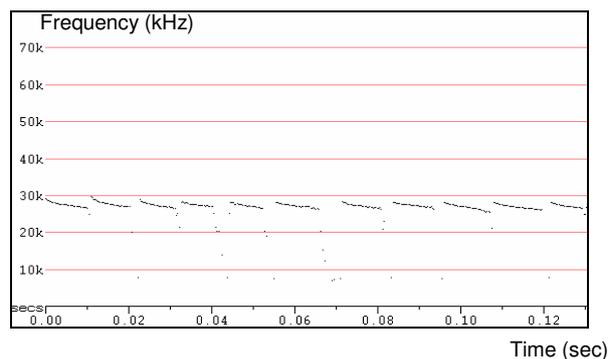
Little pied bat *Chalinolobus picatus* recorded at site 1 Example Creek.



Unidentified long-eared bat *Nyctophilus* sp. recorded at site 1 Example Creek.



Gould's wattled bat *Chalinolobus gouldii* recorded at site 2 Example Creek.



Inland free-tailed bat *Mormopterus* 'species 3' (*sensu* Adams *et al.* 1988) recorded at site 6.

Note: The calls of *C. gouldii* and *Mormopterus* 'species 3' are very similar, and overlap in characteristic frequency. Calls of *C. gouldii* were distinguished by the alternating characteristic frequency and broader frequency sweep, including a steeper initial section. Calls of *Mormopterus* 'species 3' were distinguished by the lack of alternating characteristic frequency, flatter pulse shape and the presence of harmonic traces in some pulses.