
Appendix 3.14. Supplement APP 4- Bundeena Bat Call Report RPS 2014



**ECHO
ECOLOGY**

Bat Call Identification

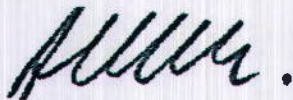
Bundeena, NSW

Prepared for
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This report has been prepared to document the analysis of digital ultrasonic bat echolocation calls received from a third party. The data was not collected by the author and as such no responsibility is taken for the quality of data collection or for the suitability of its subsequent use.

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1.0 INTRODUCTION

This report has been commissioned by RPS Australia East Pty Ltd to analyse bat echolocation call data (Anabat, Titley Electronics) collected from Bundeena, NSW. Data was provided electronically to the author. This report documents the methods involved in analysing bat call data and the results obtained only.

2.0 METHODS

The identification of bat echolocation calls recorded during surveys was undertaken using AnalookW (Version 4.0r) software. The identification of calls was undertaken with reference to Pennay *et al.* (2004) and through the comparison of recorded reference calls from the Sydney Basin. Reference calls were obtained from the NSW database and from the authors personal collection.

Each call sequence ('pass') was assigned to one of five categories, according to the confidence with which an identification could be made, being:

- Definite - Pass identified to species level and could not be confused with another species
- Probable - Pass identified to species level and there is a low chance of confusion with another species
- Possible - Pass identified to species level but short duration or poor quality of the pass increases the chance of confusion with another species
- Species group - Pass could not be identified to species level and could belong to one of two or more species. Occurs more frequently when passes are short or of poor quality
- Unknown - Either background 'noise' files or passes by bats which are too short and/or of poor quality to confidently identify.

Call sequences that were less than three pulses in length were not analysed and were assigned to 'Unknown' and only search phase calls were analysed. Furthermore, some species are difficult to differentiate using bat call analysis due to overlapping call frequencies and similar shape of plotted calls and in these cases calls were assigned to species groups.

The total number of passes (call sequences) per unit per night was tallied to give an index of activity.

It should be noted that the activity levels recorded at different sites may not be readily able to be compared. Such comparisons are dependent on many variables which need to be carefully controlled during data collection and statistically analysed. Influential variables include wind, rain, temperature, duration of recording, season, detector and microphone sensitivity, detector placement, weather protection devices etc.

2.1 Characteristics Used to Differentiate Species

Rhinolophus megaphyllus was differentiated from other bat species on the basis of characteristic frequency.

3.0 RESULTS

A total of 133 call sequences were recorded, of which 36 call sequences were able to be analysed (ie were not 'noise' files or bat calls of short length). Of the bat calls, 29 call sequences (81 %) were able to be confidently identified (those classified as either definite or probable identifications) to species level (Table 3-1). Species recorded confidently within the site include:

- *Rhinolophus megaphyllus* (Eastern horseshoe bat)

Additionally, the following bat species potentially occurred within the site, but could not be confidently identified (those calls classified as possible or as a species group):

- *Chalinolobus gouldii* (Gould's wattled bat)
- *Miniopterus schreibersii oceanensis* (Eastern bentwing bat)
- *Mormopterus (Micronomus) norfolkensis* (East coast free-tailed bat)
- *Mormopterus (Ozimops) ridei* (Eastern free-tailed bat)
- *Vespadelus darlingtoni* (Large forest bat)
- *Vespadelus regulus* (Southern forest bat)

It should be noted that additional bat species may be present within the site but were not recorded by the detectors and habitat assessment should be used in conjunction with these results to determine the likelihood of occurrence of other bat species.

Table 3-1 below summarises the results of the bat call analysis.

Table 3-1: Results of bat call analysis (number of passes per site per night)

IDENTIFICATION	Anabat 22/09/2014	Anabat 23/09/2014
DEFINITE		
<i>Rhinolophus megaphyllus</i>	11	-
PROBABLE		
<i>Rhinolophus megaphyllus</i>	18	-
POSSIBLE		
<i>Rhinolophus megaphyllus</i>	4	-
SPECIES GROUPS		
<i>Chalinolobus gouldii</i> / <i>Mormopterus (Micronomus) norfolkensis</i> / <i>Mormopterus (Ozimops) ridei</i>	2	-
<i>Miniopterus schreibersii oceanensis</i> / <i>Vespadelus darlingtoni</i> / <i>Vespadelus regulus</i>	1	-
UNKNOWN		
'Noise' files	71	1
Unknown	25	-
TOTAL	132	1

4.0 SAMPLE CALLS

A sample of the calls actually identified from the site for each species is given below.

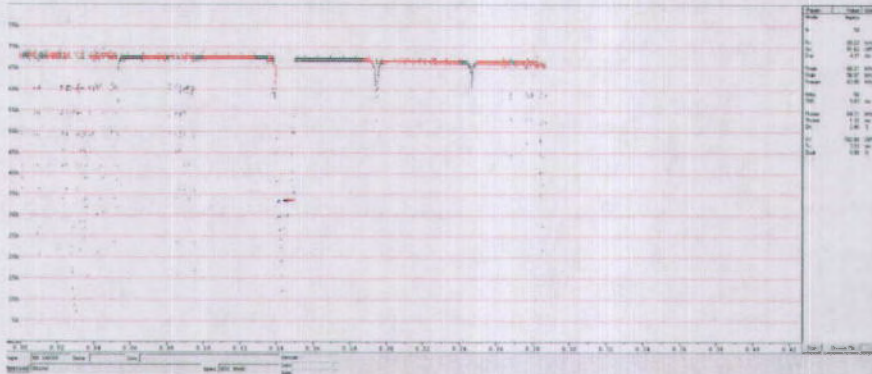


Figure 4-1: *Rhinolophus megaphyllus* definite call

5.0 REFERENCES

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