Microbat Call Identification Report

Client : Eco Planning
Project Name: Kembla Grange
Report Date : 6 April 2015

17/04/16

Contents

1. Introduction

This report has been commissioned by Eco Planning to analyse bat echolocation call data collected from a site named Kembla Grange. Data was provided electronically to the author. This report documents the methods involved in analysing bat call data and the results obtained only.

2. Methods

The identification of bat echolocation calls recorded during surveys was undertaken using AnalookW (Version 4.1i) software. The identification of calls was undertaken with reference to Pennay and others (2004) and through the comparison of recorded reference calls from the NSW regional database. 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 low 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.

3. Results

A total of 106 call sequences were recorded, of which 36 call sequences were able to be analysed (i.e. were not 'noise' files or bat calls of short length). These five calls were only categorised as possible as they were generally very short and of a poor quality. This represents a relatively low number of calls recorded particularly for the second night where only one species from 3 call profiles was recorded. Two Threatened species were recorded from the Site the Chocolate Wattled Bat was recorded from 20 call profiles and represented the most numerous calls of any species from the site. Only 2 calls of short duration were recorded from the other Threatened species recorded from the site; the Eastern Bentwing Bat.

Table 1: Bat species list

Austronomus australis	White-striped freetail Bat
Chalinolobus gouldii	Gould's Wattled Bat
Chalinolobus morio	Chocolate Wattled bat

Miniopterus schreibersii oceanensis	Eastern Bentwing Bat
Mormopterus (Micronomus) norfolkensis	Eastcoast Freetail Bat
Nyctophilus sp	Long-eared Bat

Table 2: Call results

Night	Label		Number	Definite	Possible	Probable
16/03/2016	Austronomus australis	White-striped freetail Bat	1	0	1	0
16/03/2016	*Chalinolobus gouldii*	Gould's Wattled Bat	3	2	0	1
16/03/2016	*Chalinolobus morio*	Chocolate Wattled bat	20	20	0	0
16/03/2016	***Miniopterus schreibersii oceanensis***	Eastern Bentwing Bat	2	1	1	0
16/03/2016	***Mormopterus (Micronomus) norfolkensis***	Eastcoast Freetail Bat	8	7	1	0
16/03/2016	low		25			
16/03/2016	short		42			
	Total Idéd		33			
	Total		100			
17/03/2016	*Nyctophilus sp*	Long-eared Bat	3	3	0	0
17/03/2016	low		1			
17/03/2016	short		2			
	Total Idéd		3			
	Total		6			

4. Sample Calls

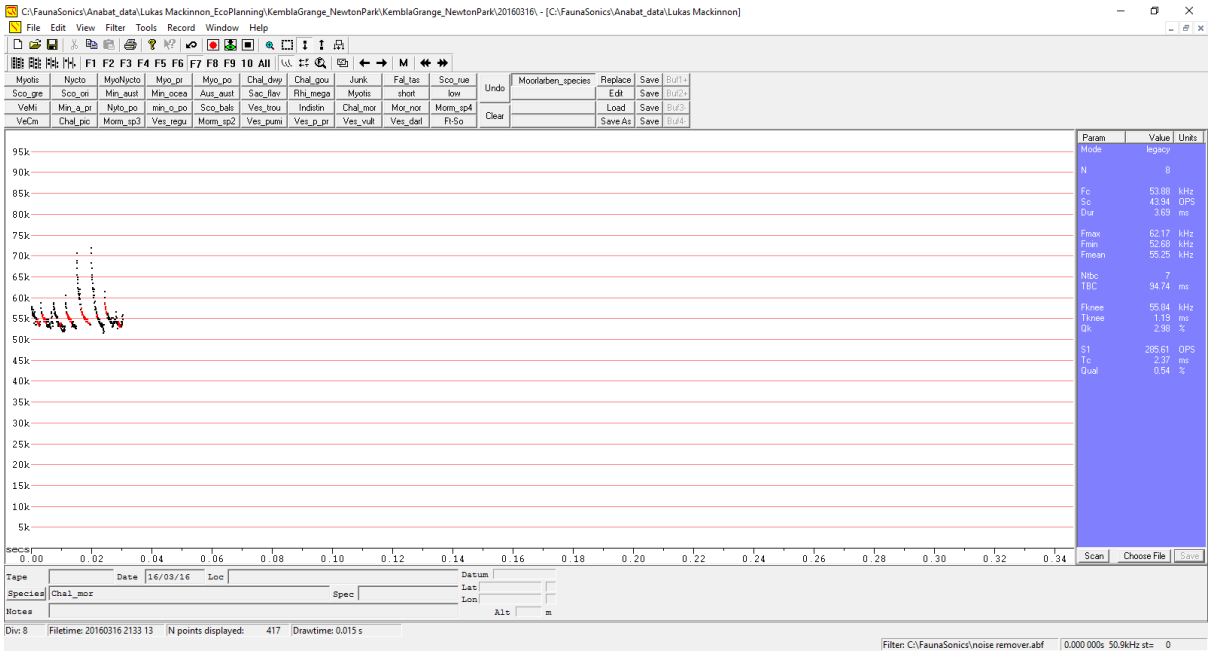

Figure 1: Call of Chalinolobus morio

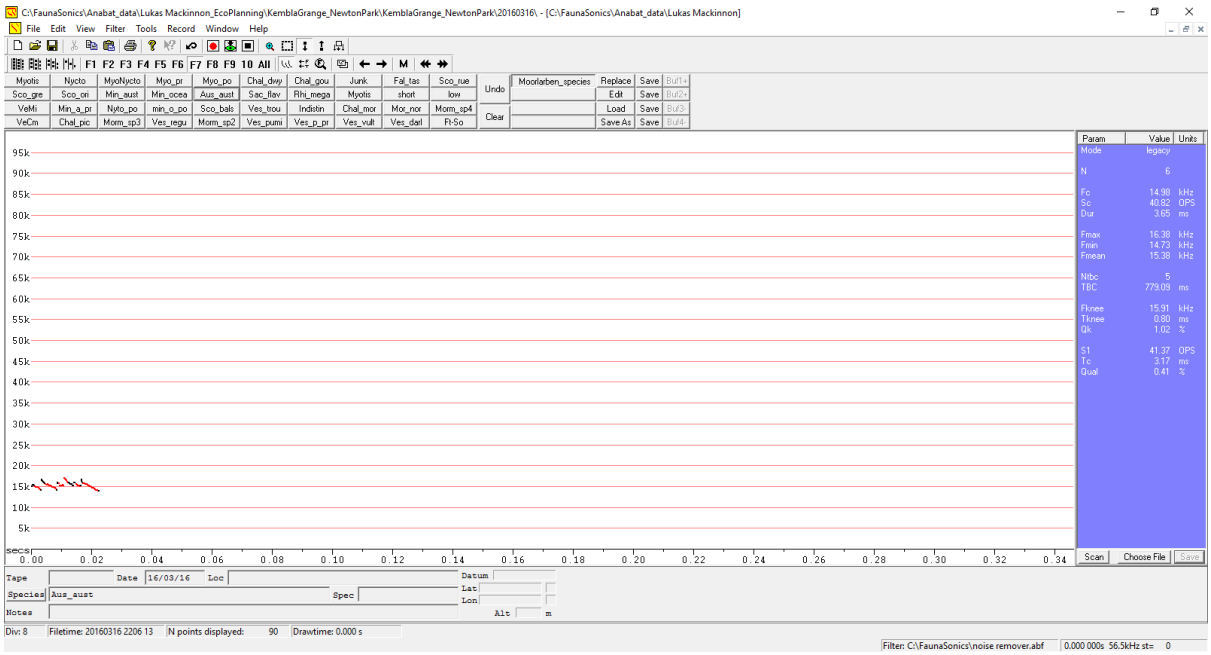

Figure 2: Call of Austronomus australis

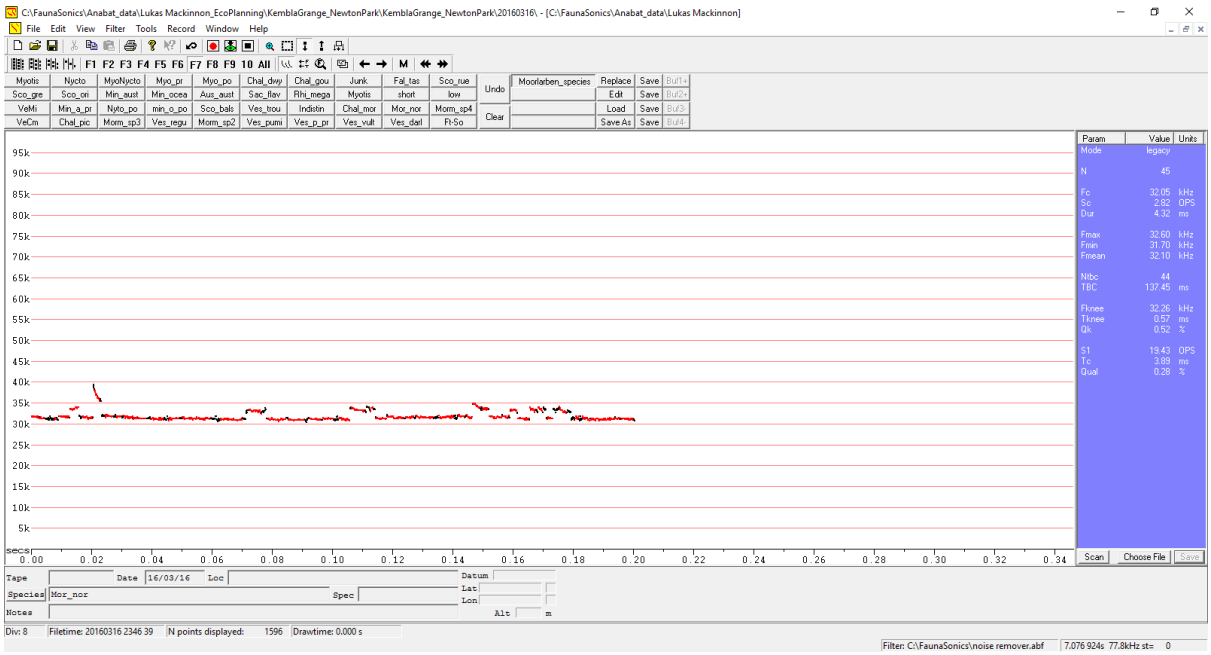

*Figure 3: Call of **Mormopterus (Micronomus) norfolkensis***

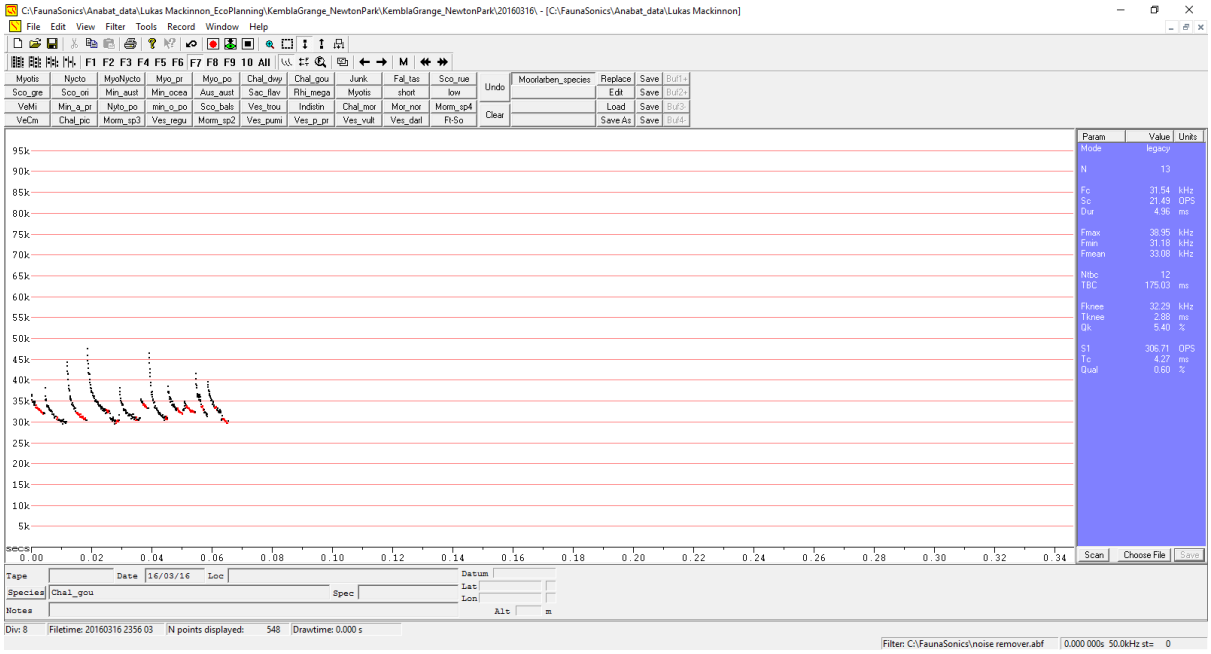

Figure 4: Call of Chalinolobus gouldii

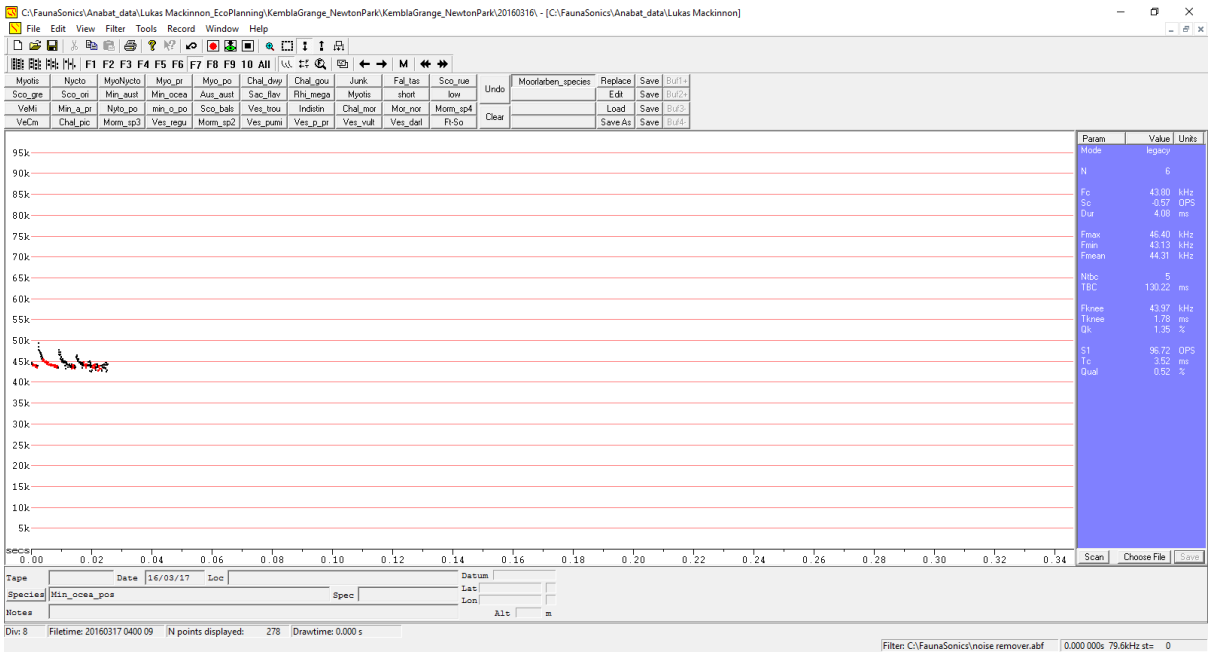

*Figure 5: Call of **Miniopterus schreibersii oceanensis***

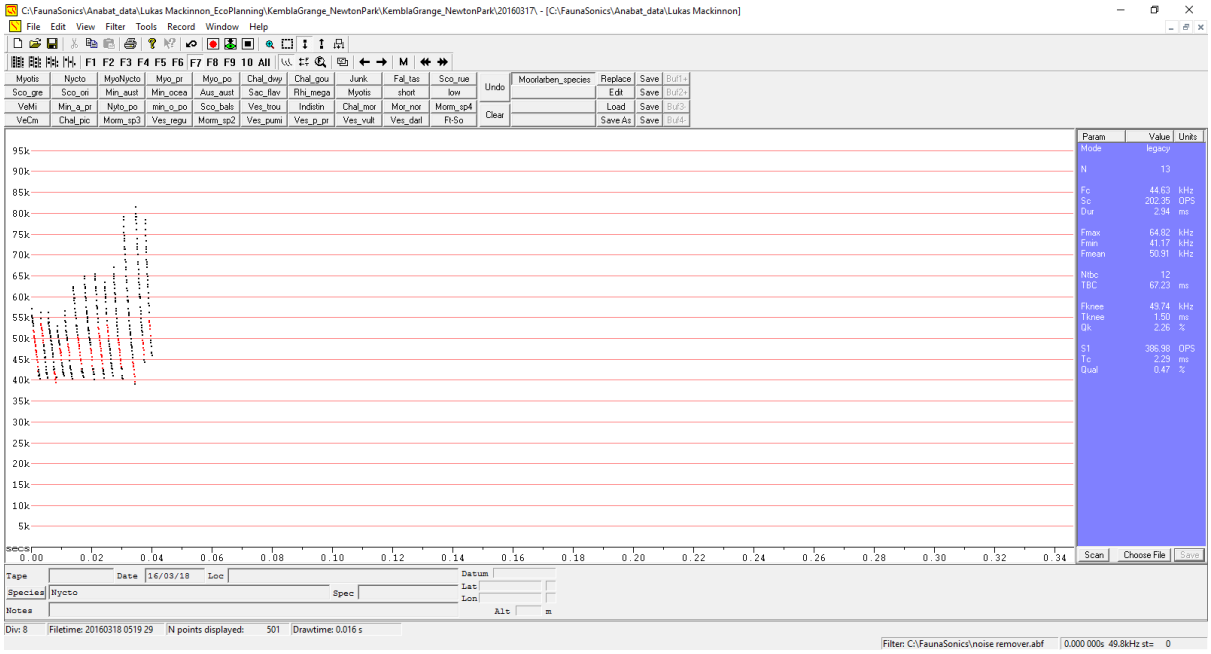

Figure 6: Call of Nyctophilus sp

5. References

Adams, M., Reardon, T.R., Baverstock, P.R. and Watts, C.H.S. (1988). Electrophoretic resolution of species boundaries in Australian Microchiroptera. IV. The Molossidae (Chiroptera). Australian Journal of Biological Sciences 41: 315-326.

Australasian Bat Society Incorporated (undated) Standards for reporting bat detector surveys, http://batcall.csu.edu.au/abs/issues/ABSAnabatsurveystandards.pdf

Churchill, S. (2008). Australian Bats. Second Edition Allen & Unwin; Crows Nest, NSW.

Hoye, G.A, Law, B.S. and Lumsden, L.F. (2008). Eastern Free-tailed Bat Mormopterus sp. Pp. 493-495 in The Mammals of Australia: Third Edition (S. van Dyck and R. Strahan, Eds.); New Holland; Sydney.

Law, B.S., Turbill, C. and Parnaby, H. (2008). Eastern Forest Bat Vespadelus pumilus. Pp. 567-568 in The Mammals of Australia: Third Edition (S. van Dyck & R. Strahan; Eds.); New Holland; Sydney.

Law, B.S., Reinhold, L. and Pennay, M. (2002). Geographic variation in the echolocation calls of Vespadelus spp. (Vespertilionidae) from New South Wale and Queensland, Australia. Acta Chiropterologica 4: 201-215.

Pennay, M., Law, B. and Reinhold, L. (2004). Bat calls of New South Wales: Region based guide to the echolocation calls of Microchiropteran bats. NSW Department of Environment and Conservation, Hurstville.

Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001a). Key to the bat calls of south-east Queensland and north-east New South Wales. Queensland Department of Natural Resources and Mines, State Forests of New South Wales, University of Southern Queensland, and New South Wales National Parks and Wildlife Service, Australia.

Reinhold, L., Herr, A., Lumsden, L., Reardon, T., Corben, C., Law, B., Prevett, P., Ford, G., Conole, L., Kutt, A., Milne, D. and Hoye, G. (2001b). Geographic variation in the echolocation calls of Gould's wattled bat Chalinolobus gouldii. Australian Zoologist 31: 618-624.

Richards, G.C., Ford, G.I. and Pennay, M. (2008). Inland Free-tailed Bat Mormopterus sp. Pp. 494-495 in The Mammals of Australia: Third Edition (S. van Dyck and R. Strahan, Eds.); New Holland; Sydney.

Thomas, D.W., Bell, G.P. and Fenton, M.B. (1987). Variation in echolocation call frequencies recorded from North American vespertilionid bats: a cautionary note. Journal of Mammalogy 68: 842-847.

Van Dyck, S. and Strahan, R. (Eds.) (2008). The Mammals of Australia: Third Edition. New Holland; Sydney.