



June 11th 2013

Andrew Milvain
VicRoads
Acting Planning Studies Manager
Planning Investigations
Locked Bag 23 Camberwell VIC 3124

Attention: Andrew Milvain

Email: .Milvain@roads.vic.gov.au (Phone 03 9811 8168)

Dear Andrew,

**RE: MURRAY RIVER CROSSING ECHUCA: ECHUCA-MOAMA BRIDGE (EPBC
2013/6850)
BL&A PROJECT NUMBER 8194.10**

The Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) has requested additional information with regards to the referral for the above project (letter dated May 22nd 2013). More specifically, the following further information was requested:

"1) The referral documentation identifies the South-Eastern Long-eared Bat... also known as Corben's Long-eared Bat, as being present on Anabat® call recording identification. The department requires further clarification as to the presence or absence of this species in the project area, including to confirm whether the bat(s) recorded are likely to be the South-Eastern Long-eared Bat or another species of Long-eared Bat.

2) The department requires further information to confirm the presence or absence of the Superb Parrot... including discussion on any potential impacts to this species and mitigation measures to address these.

Brett Lane and Associates Pty. Ltd. (BL&A) has been commissioned by VicRoads to provide ecological input to the response to the request for further information.

Corben's Long-eared Bat

The bat call analysis was undertaken by Dr. Greg Richards. In response to the request for further information, Dr. Richards was asked to provide more information on whether the bat species was considered as being present in the study area. His response is presented in Appendix 1.

In summary, the species is considered likely to occur in the region (i.e. along the Murray River and the Echuca-Moama area), based on its distribution and habitats present in the region.

The reference calls used for the analysis were published by Drs Pennay, Lay and Reiholt in 'Bat Calls of New South Wales' (Churchill 2000). Although it is very difficult to distinguish between a number of long-eared bat species, *N. corbeni* can be distinguished by having a lower minimum call frequency compared with other *Nyctophilus* species. Its minimum call frequency is around 35 kHz, whilst

for other species it is 40 kHz. Graphic examples of call frequency extracted from Churchill (2000) are provided in Appendix 1. The letter provided by Dr. Richards also included two example calls from the data collected in the study area, attributed to *N. corbeni*. The examples clearly show in both cases that the minimum frequency is 35 kHz, as shown in Churchill (2000).

Based on the information provided it is considered that *N. corbeni* is present in the study area.

Superb Parrot

During the initial stages of the project, existing information was reviewed to determine whether Superb Parrot was likely to occur in the study area. Sources included the EPBC Act protected matters search tool and the Atlas of Victorian Wildlife. These sources indicated that the species was likely to occur given the presence of suitable habitat.

To inform this response to the request for further information two additional sources were searched: the Birds Australia Atlas and Victorian Biodiversity Atlas (VBA). As expected, the Birds Australia Atlas distribution map of Superb Parrot shows that the species has been recorded, albeit at a low reporting rate (i.e. less than 11%) (Figure 1).

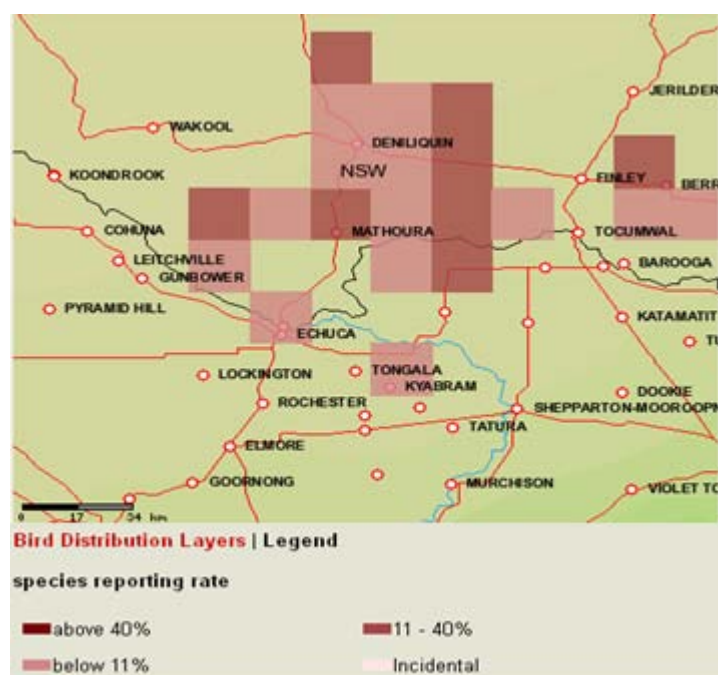


Figure 1: Distribution Map of Superb Parrot – Birds Australia Atlas

A search for Superb Parrot records was undertaken from the VBA using a 50 kilometre radius search region with Echuca being the centre point. A total of 337 Superb Parrot records have been recorded within 50 kilometres from Echuca (Figure 2).

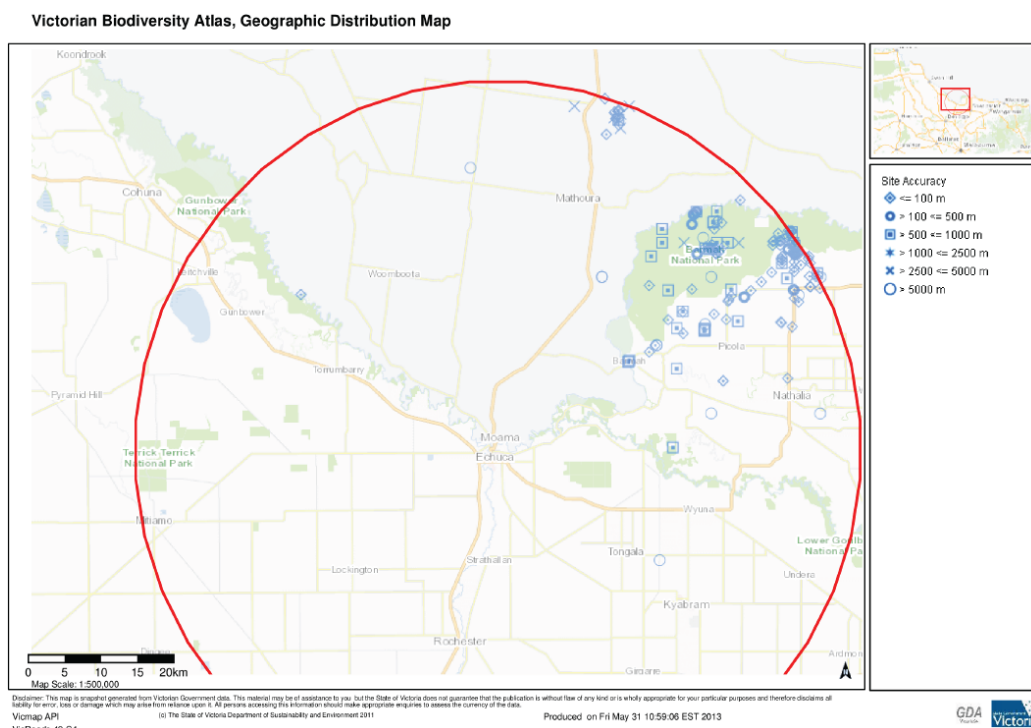


Figure 2: Distribution map of Superb Parrot records from the VBA

As is demonstrated by Figure 2, the majority of records originate from the Barmah State Forest which is a well-known breeding site for the species. The closest records to the study area were located 21.5 kilometres north-east. There were no records of Superb Parrot from the VBA within the study area or in the surrounding 20 kilometre radius (Appendix 1).

These observations are corroborated by observations from BL&A zoologists. BL&A has undertaken a suite of comprehensive ecological assessments within the study area between October 2008 and October 2012. Zoologists and ecologists have spent approximately 197 hours (Table 1) in the field during daylight hours within the study area covering seven months. Eighty-four percent of the surveys were undertaken by zoologists (i.e. 165 hours of survey time). Although no targeted surveys were undertaken for the species, Superb Parrot was not recorded on any of these occasions.

Table 1: Total number of person hours spent surveying at the study area

Date	Assessment	Zoologist present?	Survey Hours Day	Survey Hours Night
13 th - 15 th October 2008	Flora and Fauna Assessment	Yes	36	
6 th - 8 th January 2009	Targeted surveys for Bush-Stone Curlew and Squirrel Glider	Yes	9	13.5
21 st & 22 nd July 2010	Botanical survey	No	12	
26 th - 30 th September 2011	Flora and Fauna Assessment	Yes	36	
26 th & 27 th September	Spotlighting and call playback and setting up Anabat systems	Yes	12	8

Date	Assessment	Zoologist present?	Survey Hours Day	Survey Hours Night
	and Hair Tubes			
8 th - 17 th November 2011	Spotlighting and call playback and setting up Anabat systems	Yes	8	18
21 st - 23 rd November 2011	Targeted Flora Surveys	No	20	
22 nd & 23 rd November 2011	Decommissioning Anabats and Hair Tubes	Yes	12	
23 rd & 24 th February 2012	Setting up Anabat systems	Yes	8	
5 th & 6 th March 2012	Setting up Anabat systems	Yes	8	
14 th & 15 th March 2012	Decommissioning Anabat systems	Yes	8	
15 th - 18 th October 2012	Targeted Squirrel Glider Survey	Yes	16	16
17 th October 2012	Hollow Tree Assessment	Yes	12	
17 th & 18 th October 2012	Targeted Growling Grass Frog Survey	Yes		16
Total			197	71.5

The study area and Echuca-Moama townships are not considered to be core habitat for this species which prefers larger intact forests such as Barmah State Forest. The study area supports a low habitat quality for this species particularly as it is a significant distance away from core breeding habitat.

Figure 3 presents the location of Barmah Forest and Gunbower Forest in relation to Echuca, both of which support suitable habitat for Superb Parrot (red boxes). A large area of native vegetation is present south of Barmah Forest (light blue box), though it is approximately eight kilometres from the proposed works. Remaining areas are highly cultivated agricultural land that supports little or no native vegetation. Considering the absence of suitable habitat within the region, apart from Barmah and Gunbower Forests, it is highly unlikely that significant numbers of Superb Parrot would regularly move across the landscape.

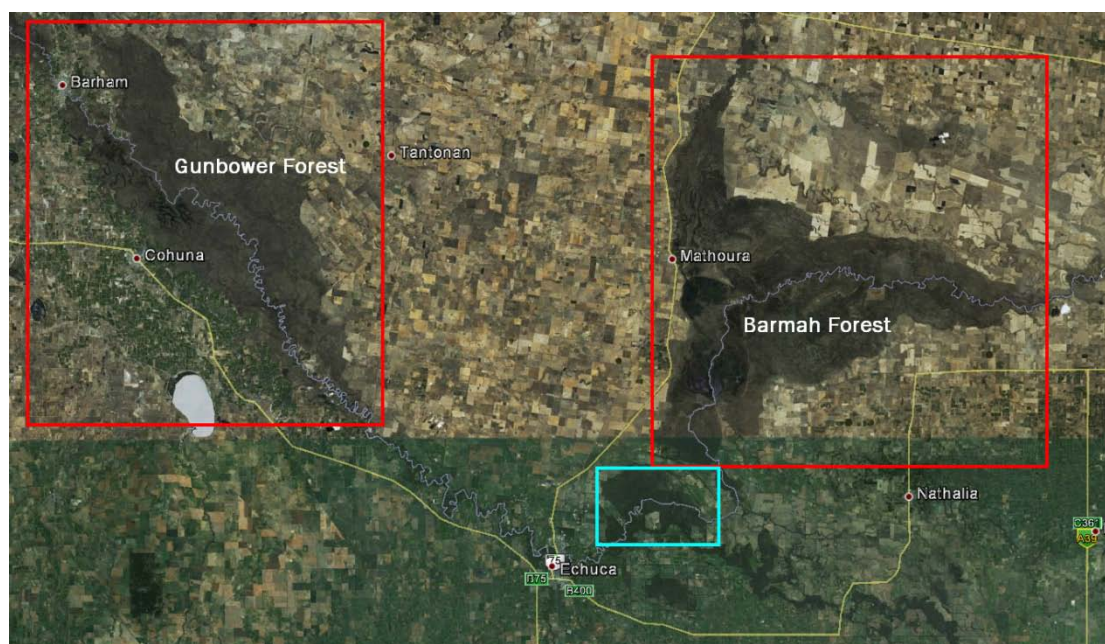


Figure 3: Areas of native vegetation or areas likely to comprise native vegetation in the region

As previously mentioned, the majority of VBA records originated from Barmah State Forest, which is a River Red-gum forest. Other records were from similar habitats at lagoons, waterholes and along water courses. Although there is suitable habitat for the species in the study area the lack of recent and regular records suggests that this species does not regularly occur. Superb Parrot may occasionally use the area as a wildlife corridor to travel to Gunbower National Park however most movements are recorded to the north of Echuca in NSW through Mathoura (Figure 3).

Considering the above, impacts on Superb Parrot such as the removal of sub-optimal habitat would be minimal and temporary and would not be significant under the EPBC Act significant impact guidelines as outlined in the EPBC Act Referral (EPBC Reference 2013/6850).

Although no mitigation measures of have been designed to specifically target the Superb Parrot, the clearance of native vegetation would be restricted to the physical footprint of the road and bridge construction.

If we can be of further assistance or if you have any other enquiries please do not hesitate to call me.

Yours sincerely,



Gabrielle Graham
Project Manager and Senior Ecologist
Brett Lane & Associates Pty. Ltd.

[@ecologicalresearch.com.au](mailto:enquiries@ecologicalresearch.com.au)

Appendix 1: Further information provided by Dr. Richards in relation to *N. corbeni*



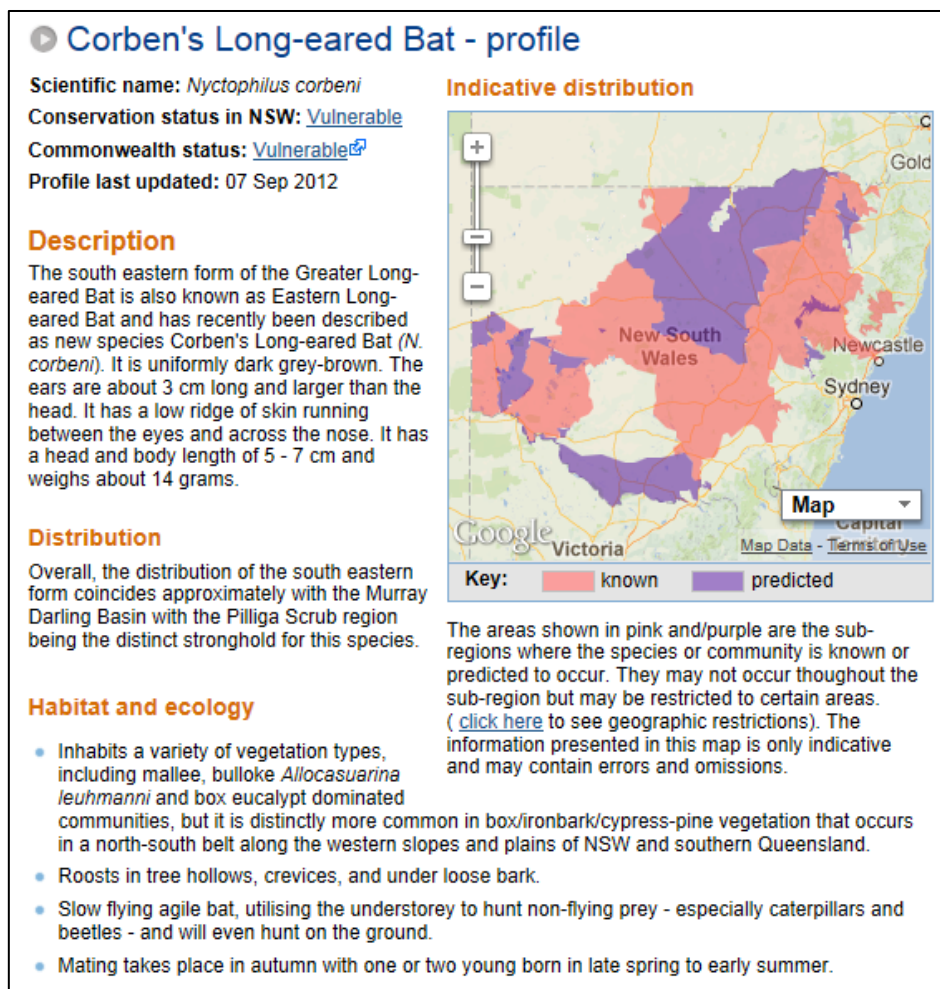
**Greg Richards and
Associates Pty Ltd**

PO Box 9, Gungahlin ACT 2912
02 62550606 0408221520

TO WHOM IT MAY CONCERN RE ECHUCA-MOAMA BRIDGE PROPOSAL BY VIC ROADS

I have been asked to provide further information with regards to Corben's Long-eared Bat because the Commonwealth regulator has been advised that it is unlikely that the species is present in the Echuca-Moama area, particular given their distribution and the habitats present. I am of the opinion that the alternative advice provided to the Commonwealth by other parties is incorrect, and is in opposition to the information publicly available on the Commonwealth's own EPBC Act website. Shown below is a copy of the relevant page about Corben's Longeared Bat (Figure 1).

Figure 1: Commonwealth website page relating to distribution of, and habitats utilised by, Corben's Longeared Bat



It is apparent then, that this species would be present in habitats along the Murray River, and the species is known from the Echuca-Moama area. Regardless, the calls recorded by staff from Brett Lane and Associates included some that I considered to be *Nyctophilus corbeni*.

It is well known amongst bat experts that calls from all species of Longeared bats are difficult to separate past genus level unless the bat is very close to the bat detector microphone. Hence, in most surveys, all Longeared bat calls are lumped into a category often labelled "*Nyctophilus* sp." or similar. However, at least (in my opinion and that of several others) *N. corbeni* can be distinguished somewhat by having a lower minimum call frequency than other, smaller *Nyctophilus*. *N. corbeni* is the only one that has a minimum frequency around 35 kHz, others are usually above 40 kHz. Features of the calls are shown in Figures 2 and 3, which are reference calls published by eminent scientists Drs Michael Pennay, Bradley Law and Linda Reinholt in "*Bat Calls of New South Wales*"

Figure 2: Echolocation calls of *Nyctophilus corbeni* (previously known as *N. timoriensis*)

Nyctophilus timoriensis



- . Almost identical in shape and characteristics to other
- . *Nyctophilus* species. Steep, near vertical, starting at
- . between 60 and 80 kHz, usually dropping to between
- . 31 to 37 kHz (n = 16). Soft callers, fragmentary calls
- . typical.
- . Call characteristics and frequencies almost completely overlap with
- . *Nyctophilus geoffroyi*, *N. bifax*, and *N. timoriensis* making them
- . indistinguishable using standard Anabat / Analook parameters.
- . Bullen and McKenzie (2002) have devised a method to differentiate Western
- . Australian *Nyctophilus* species using spectral analysis of the frequency
- . domain to differentiate Western Australian *Nyctophilus* species. This
- . technique may help to differentiate these species.
- . Available data shows little indication of variation in call characteristics for this
- . species in New South Wales.

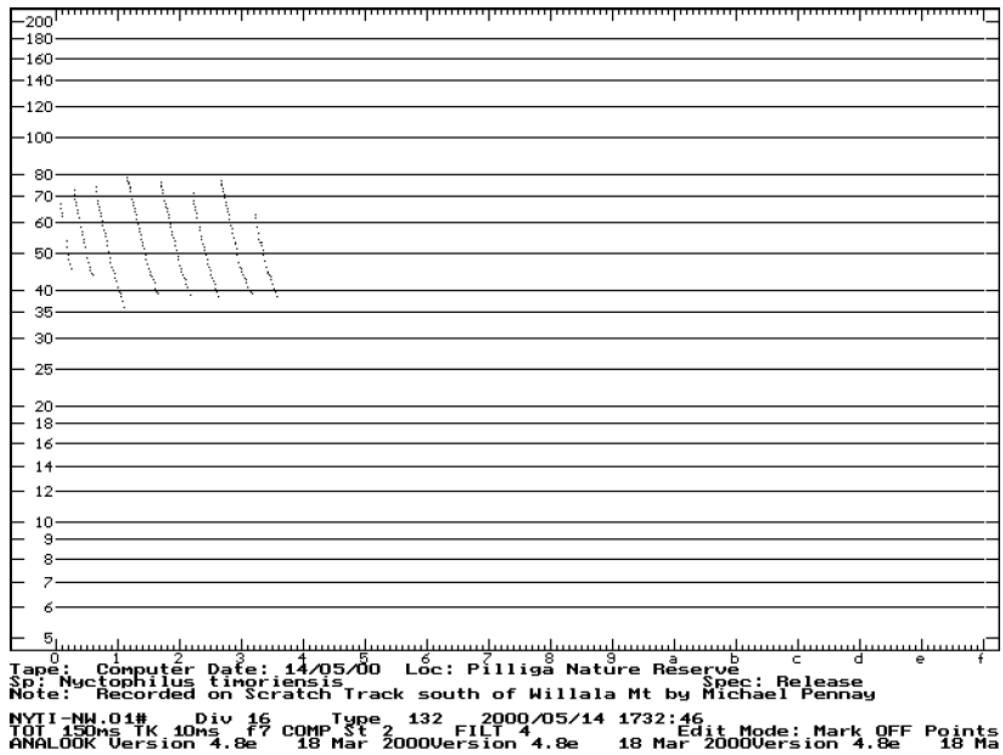
Regional Information

Western Slopes & Plains: Average starting frequency 71 kHz dropping to 43 kHz, mean frequency 53 kHz (n = 7).

Far West: Average starting frequency 70.5 kHz dropping to 42 kHz, mean frequency 53 kHz (n = 9).

North East, Sydney Basin, Southern, Riverina: No reference calls from these regions.

Western Slopes & Plains



Far west

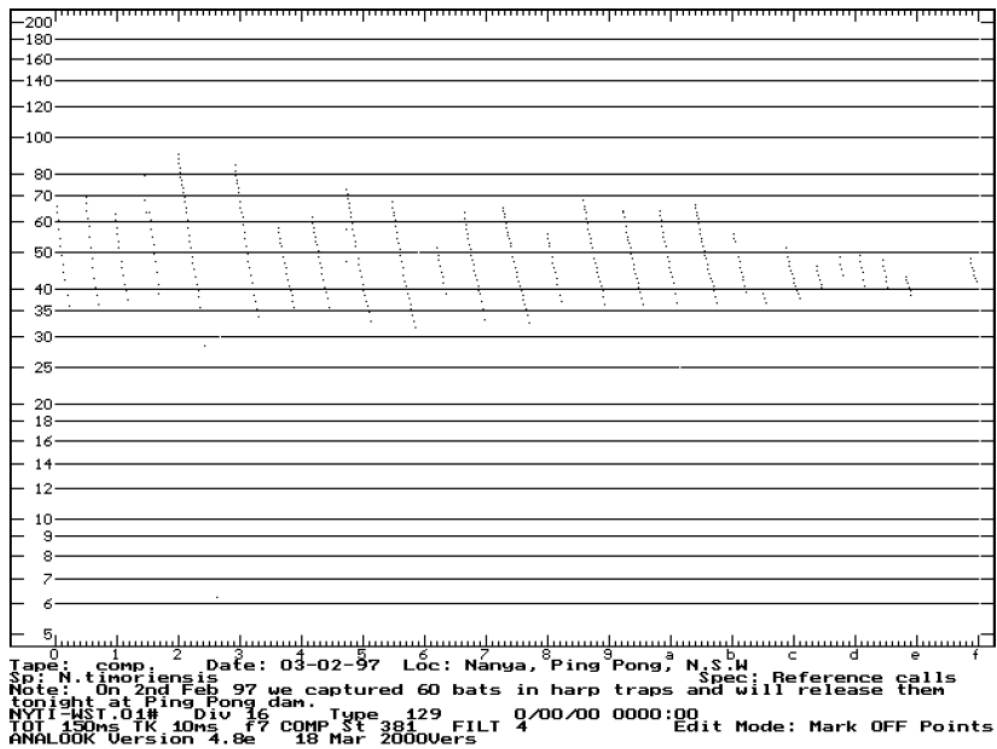


Figure 3: Echolocation calls of *Nyctophilus geoffroyi* which is sympatric with *N. corbeni*.

Nyctophilus geoffroyi



Steep, near vertical, starting at between 65 to 80 kHz, usually dropping to between 35 to 47 kHz (n = 51). Good quality calls usually have two changes in the slope in the middle or lower half. The first section is longest and steepest followed by a flatter section and then a steeper tail.

All *Nyctophilus* spp. are soft callers so short fragmentary calls are typical.

Call characteristics and frequencies almost completely overlap with *Nyctophilus gouldi*, *N. bifax*, and *N. timoriensis* making them indistinguishable using standard Anabat / Analook parameters.

Bullen and McKenzie (2002) have devised a method to differentiate Western Australian *Nyctophilus* species using spectral analysis of the frequency domain to differentiate Western Australian *Nyctophilus* species. This technique may help to differentiate these species.

Easily confused with *Myotis macropus*, but may be distinguished by several features. Pulse interval is usually greater than 95 ms and initial slope less than 300 OPS. If interval is between 75 and 95 ms and slope between 300 and 400 OPS then cannot be distinguished from *Myotis*.

Superficially similar to *Kerivoula*, but much lower in frequency.

Available data shows little indication of variation in call characteristics for this species in New South Wales. However, calls from west of the Great Dividing Range, particularly the Riverina and Far west regions are generally lower in frequency with longer durations.

Regional Information

North East: Average starting frequency 72 kHz dropping to 42 kHz, mean frequency 57 kHz (n = 2).

Western Slopes & Plains: Average starting frequency 66 kHz dropping to 46 kHz, mean frequency 53.5 kHz (n = 14).

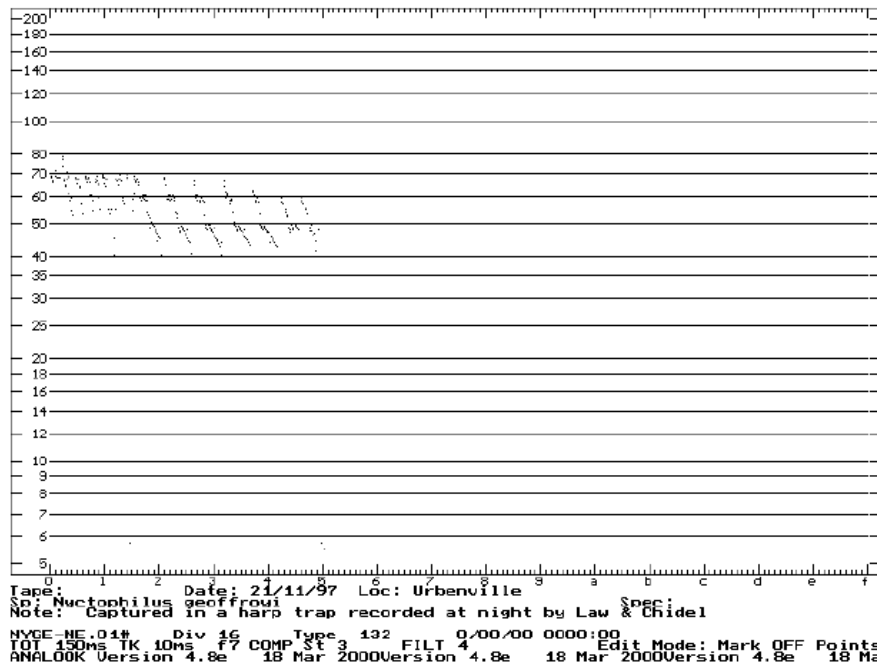
Sydney Basin: Average starting frequency 71 kHz dropping to 39 kHz, mean frequency 47 kHz (n = 3).

Southern: Average starting frequency 67 kHz dropping to 45 kHz, mean frequency 53.5 kHz (n = 10).

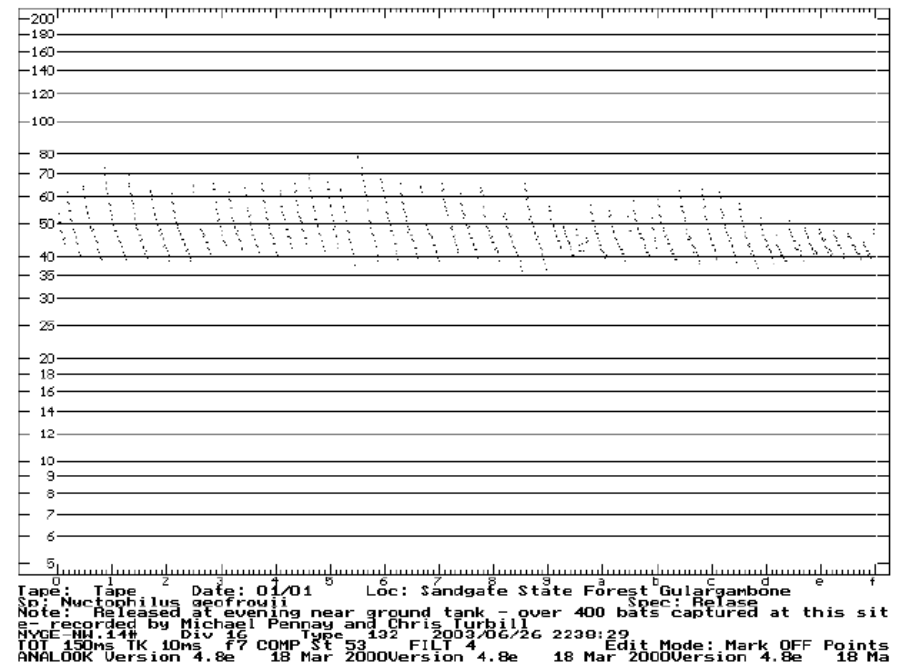
Riverina: Average starting frequency 65.5 kHz dropping to 39 kHz, mean frequency 49 kHz (n = 11). Occasionally calls display distinctive "social" non search pulses, long (> 10 ms), curved, dropping from 45 to 50 kHz to 20 to 25 kHz.

Far West: Average starting frequency 65 kHz dropping to 45 kHz, mean frequency 46 kHz (n = 11).

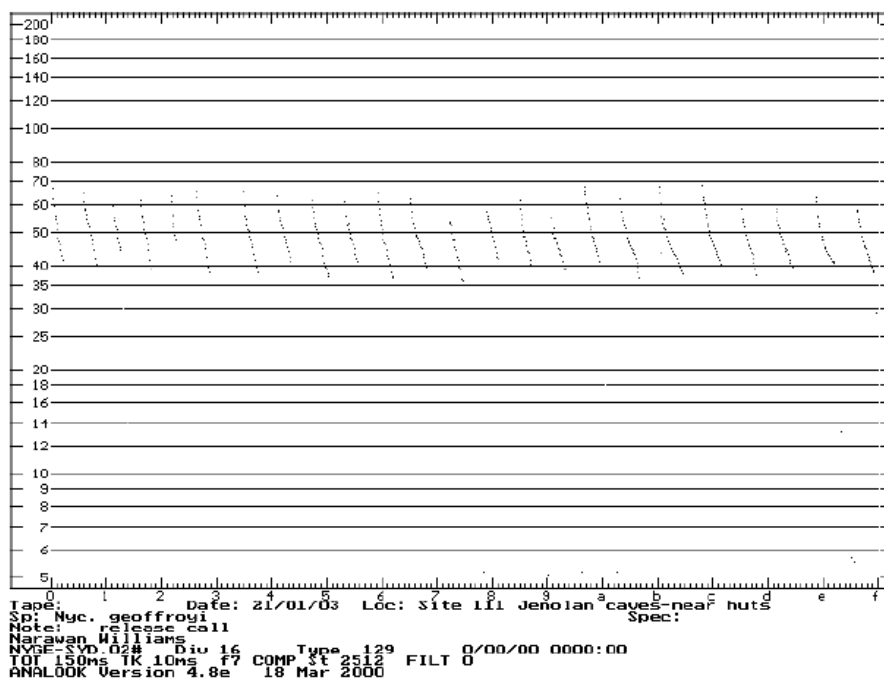
North East



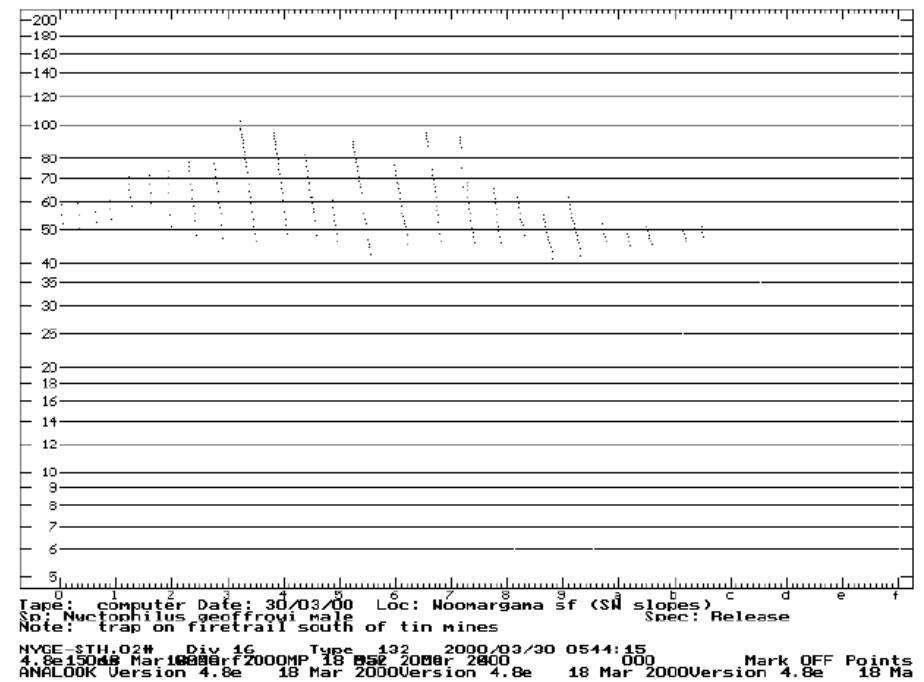
Western Slopes & Plains



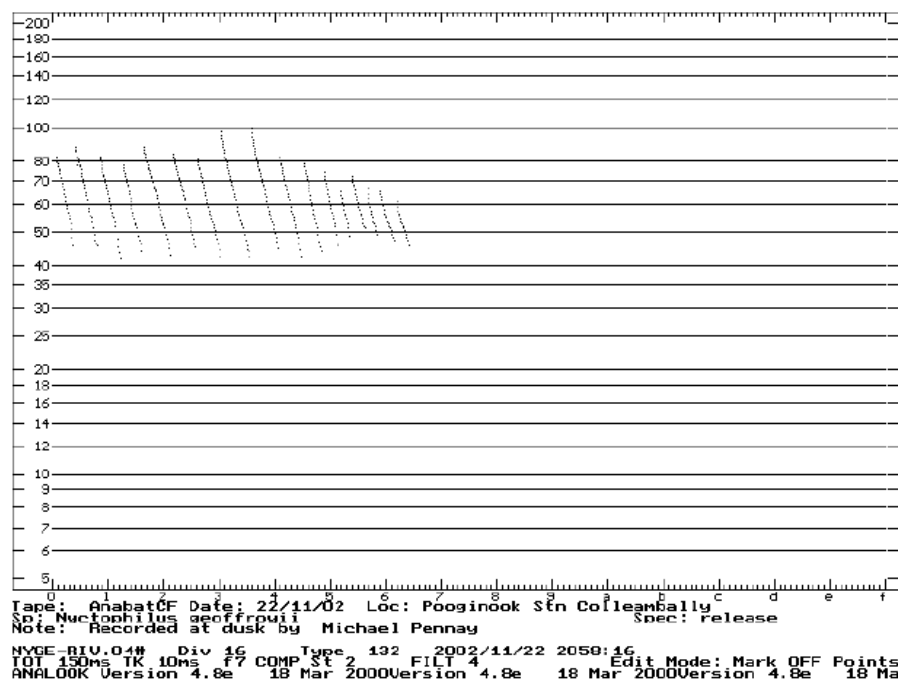
Sydney Basin



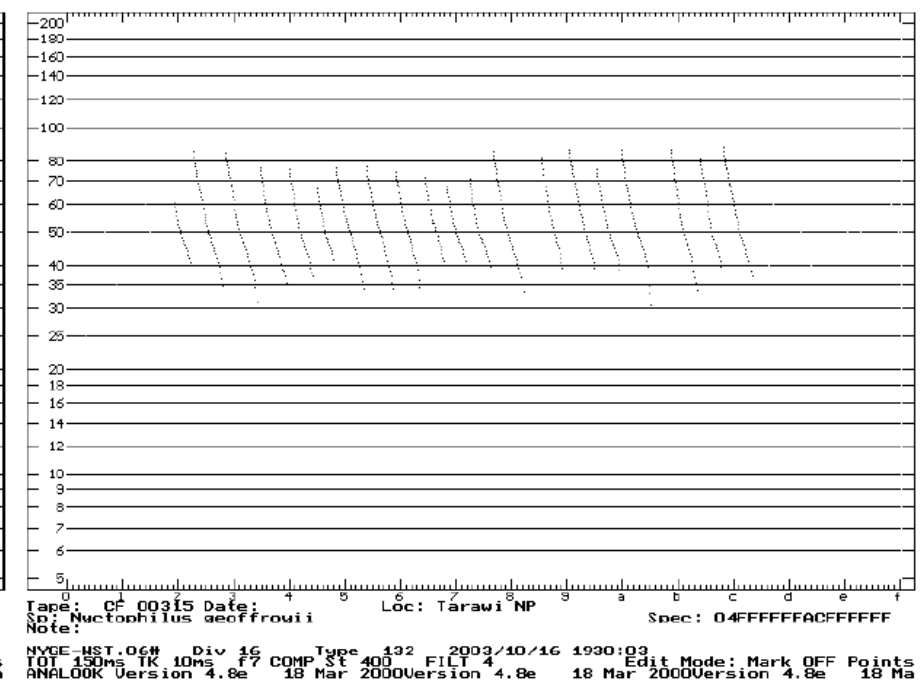
Southern



Riverina

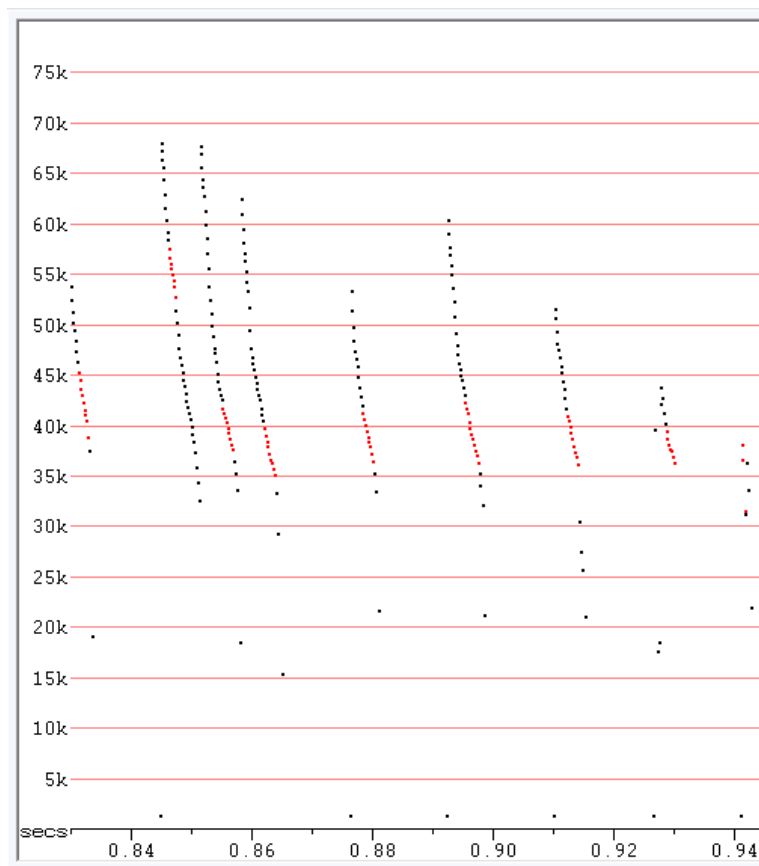
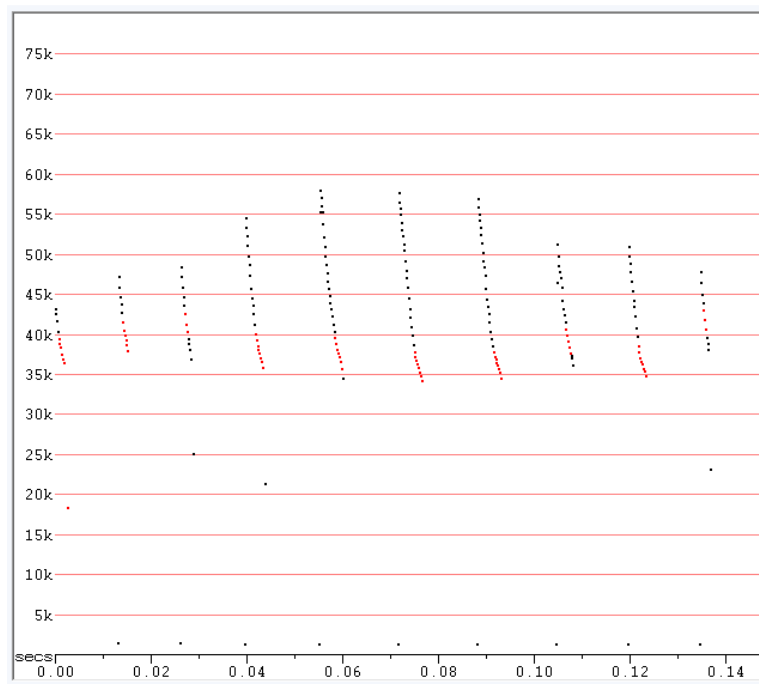


Far west



Examples of the calls that I identified as most likely being Corben's Longeared Bat are shown in Figure 4. These were recorded at site 4 during the Brett Lane and Associates bat surveys. Proprietary software (Analog-W) was used to view the call files. The y-axis in the displays shown in Figures 2 and 3 are logarithmic, and in Figure 4 it is linear. Whatever the scale, the salient feature (minimum frequency around 35 kHz) is obvious.

Figure 4: Two examples of calls attributed to *Nyctophilus corbeni* on the basis of a minimum frequency of 35 kHz, as shown in Churchill (2000).



It can be concluded that Brett Lane and Associates reported accurately that Corben's Longeared Bat is present in the area which is the subject of the Commonwealth EPBC Act Referral. It should also be noted that I agree that any impacts upon this species through the project will be minimal and will not be significant.

A handwritten signature in black ink, reading "J.C. Richards". The signature is written in a cursive style with a large, looping initial "J" and a distinct "C" before the surname "Richards".

Dr G.C. Richards, 7 June 2013