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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

▶ Corben's Long-eared Bat - profile

Scientific name: *Nyctophilus corbeni*
Conservation status in NSW: [Vulnerable](#)
Commonwealth status: [Vulnerable](#)
Profile last updated: 07 Sep 2012

Description

The south eastern form of the Greater Long-eared Bat is also known as Eastern Long-eared Bat and has recently been described as new species Corben's Long-eared Bat (*N. corbeni*). It is uniformly dark grey-brown. The ears are about 3 cm long and larger than the head. It has a low ridge of skin running between the eyes and across the nose. It has a head and body length of 5 - 7 cm and weighs about 14 grams.

Distribution

Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species.

Habitat and ecology

- Inhabits a variety of vegetation types, including mallee, bullock *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland.
- Roosts in tree hollows, crevices, and under loose bark.
- Slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground.
- Mating takes place in autumn with one or two young born in late spring to early summer.

Indicative distribution

The areas shown in pink and/purple are the sub-regions where the species or community is known or predicted to occur. They may not occur throughout the sub-region but may be restricted to certain areas. ([click here](#) to see geographic restrictions). The information presented in this map is only indicative and may contain errors and omissions.

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.

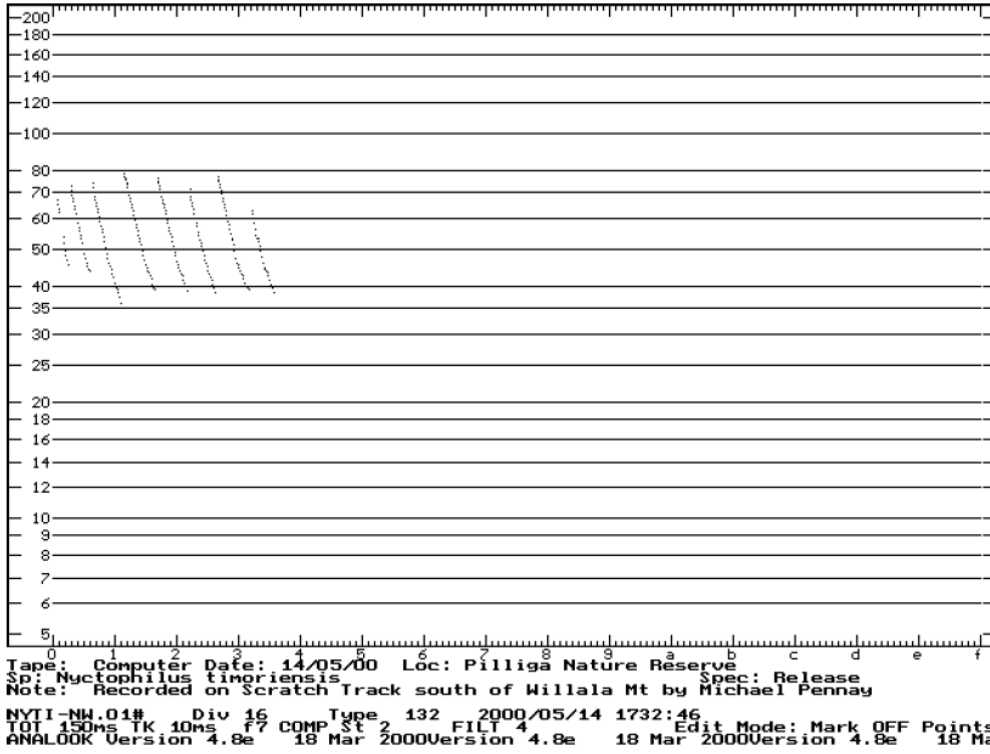
Regional Information

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

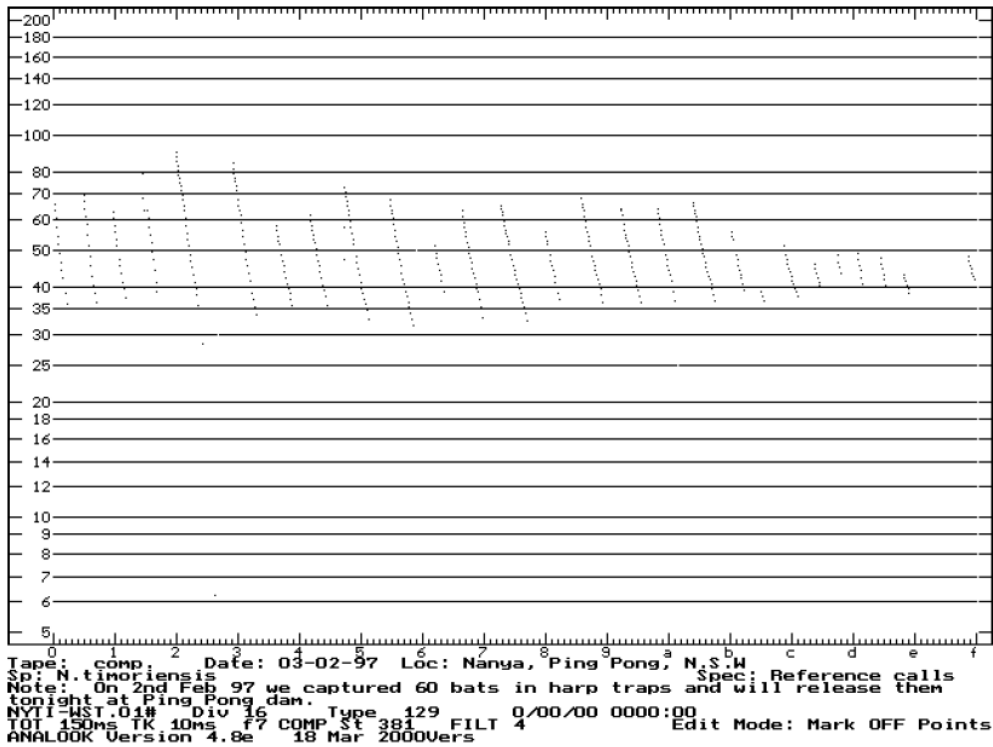


Figure 3: Echolocation calls of *Nyctophilus geoffroyi* which is sympatric with *N. corbeni*.

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).

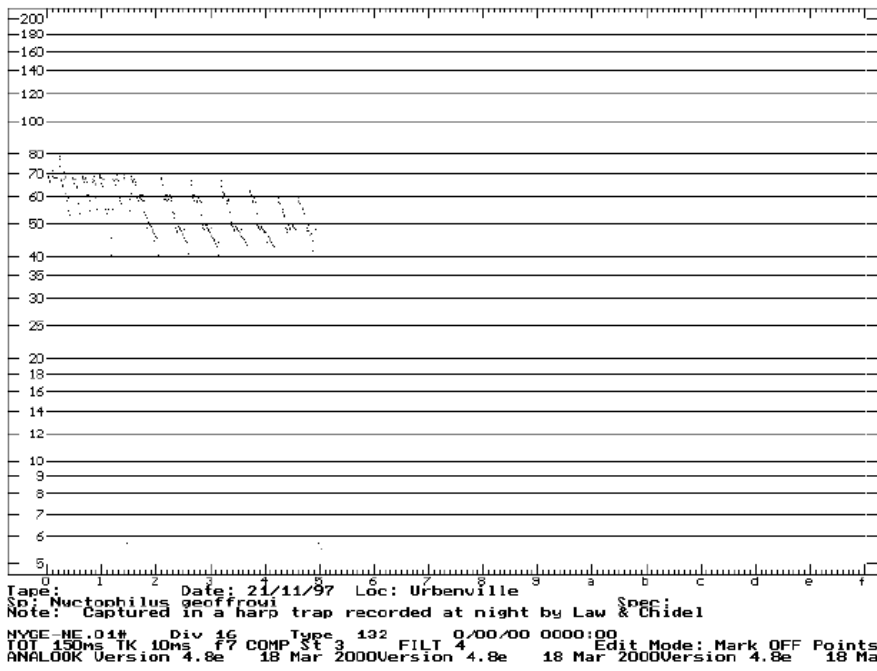
Sydney Basin: Average starting frequency 71 kHz dropping to 39 kHz, mean frequency 47 kHz (n = 3).

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

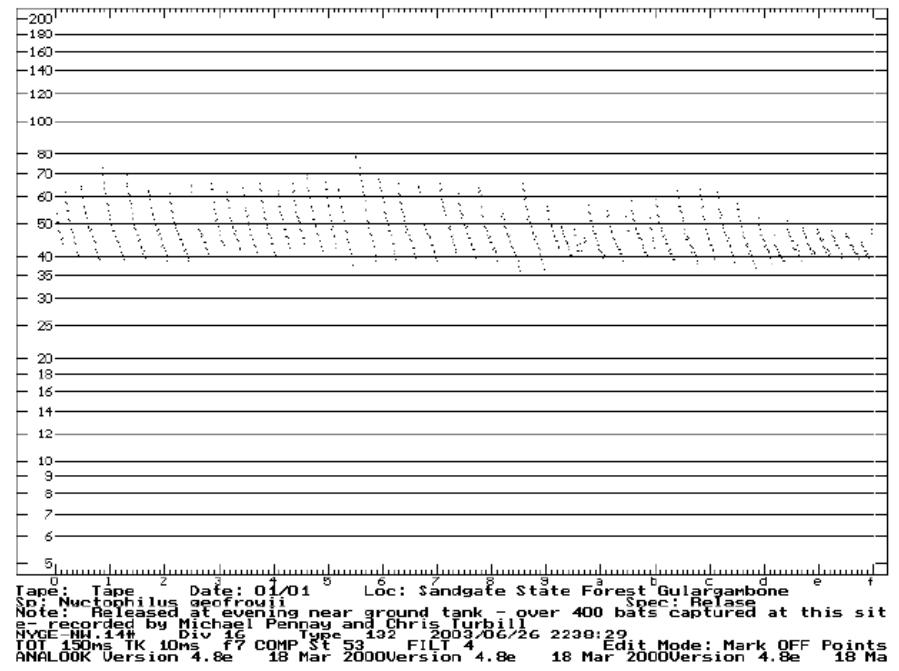
Riverina: Average starting frequency 65.5 kHz dropping to 39 kHz, mean frequency 49 kHz (n = 11). Occasionally calls display distinctive "social" non search pulses, long (> 10 ms), curved, dropping from 45 to 50 kHz to 20 to 25 kHz.

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

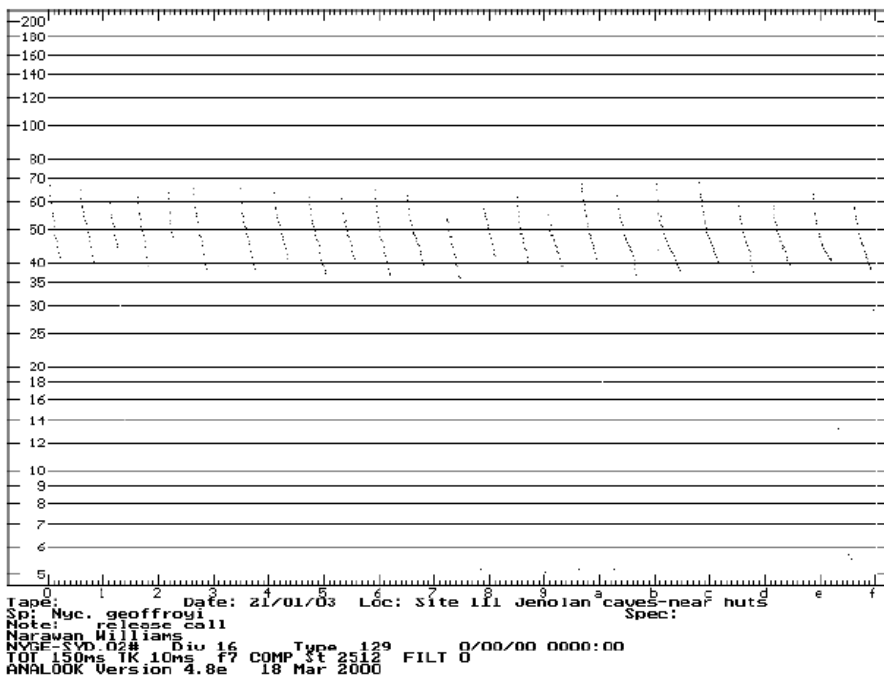
North East



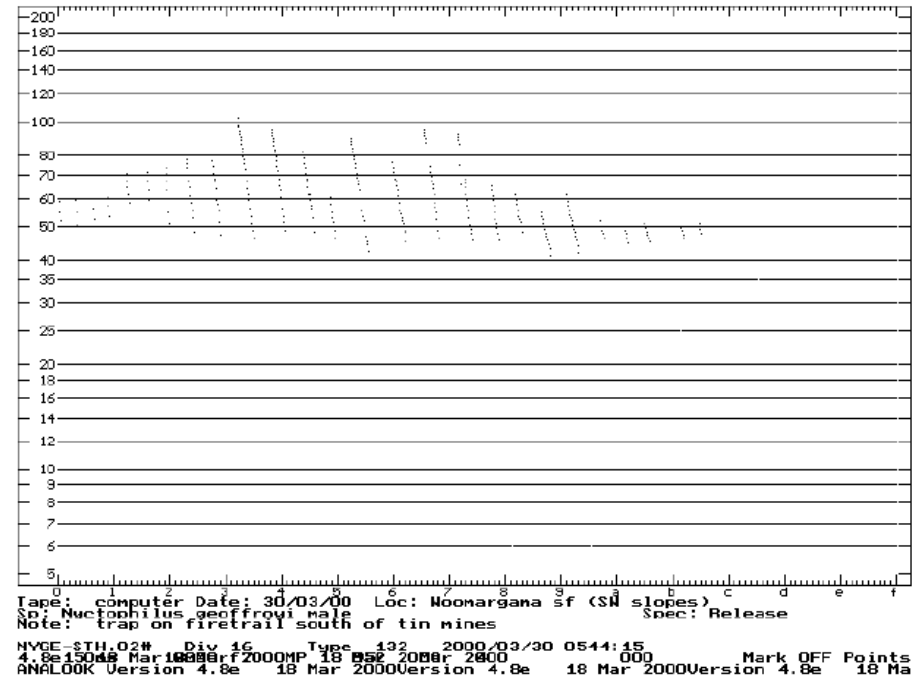
Western Slopes & Plains



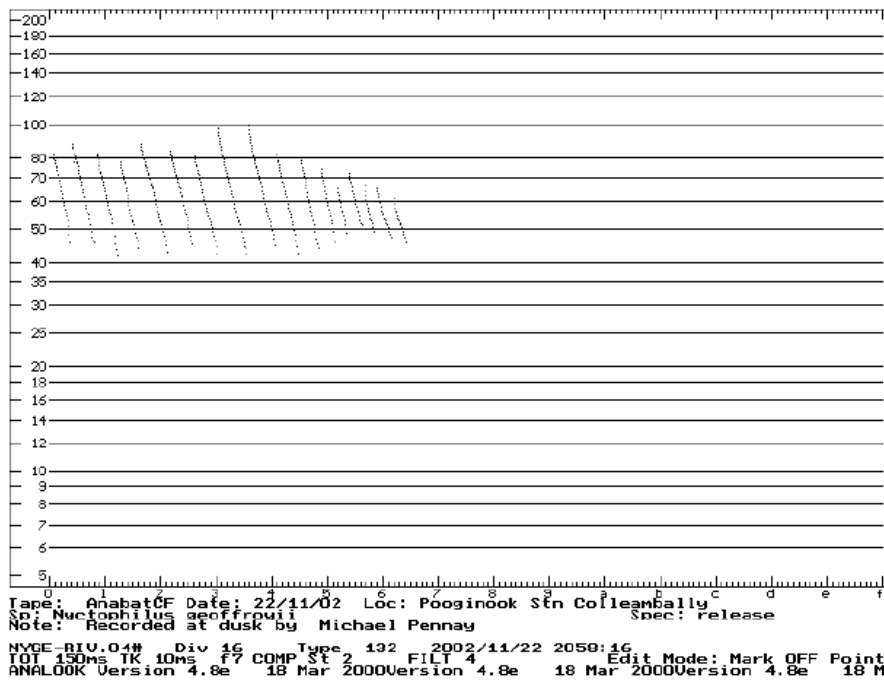
Sydney Basin



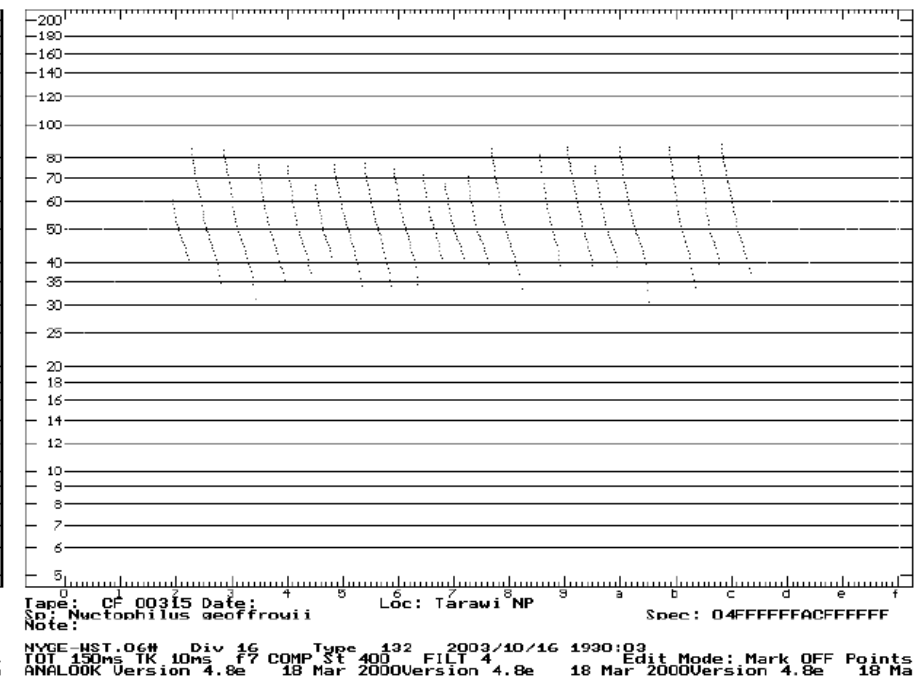
Southern



Riverina

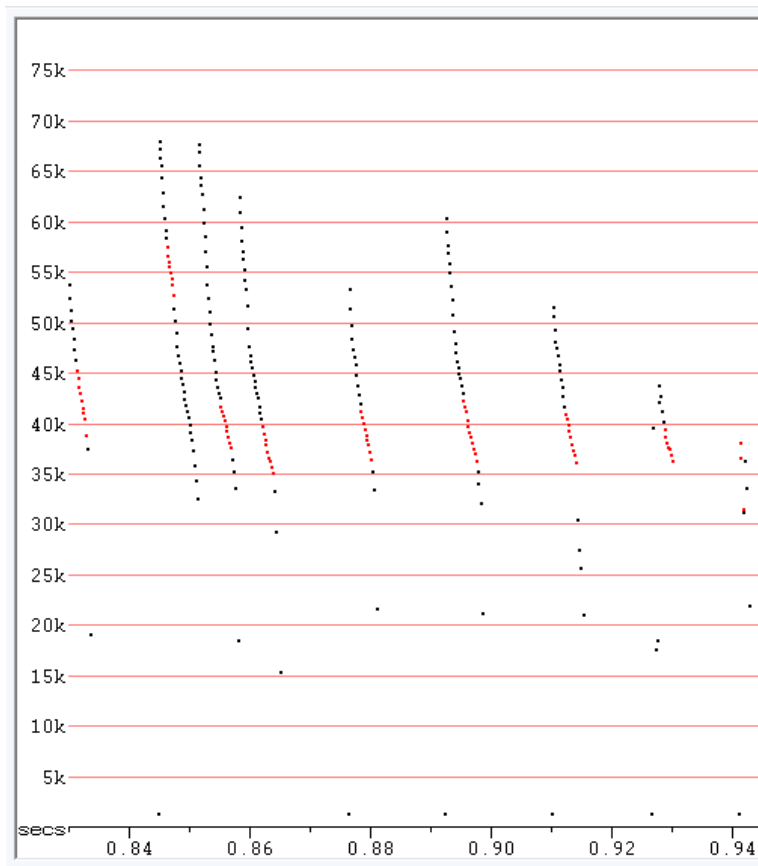
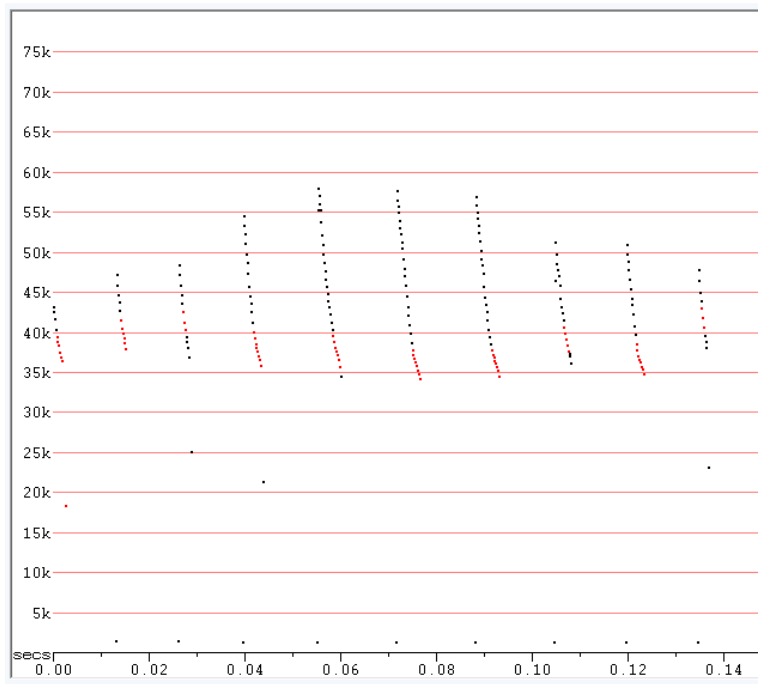


Far west



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 "G.C. Richards". The signature is written in a cursive style with a large, looping initial "G".

Dr G.C. Richards, 7 June 2013