

It's not just noise...



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Picture: Viv Jones



Picture: Tim Pearson



“...the camps are rarely quiet – in fact they are most easily located by their noise. ...much of the day is spent in noisy bickering.”

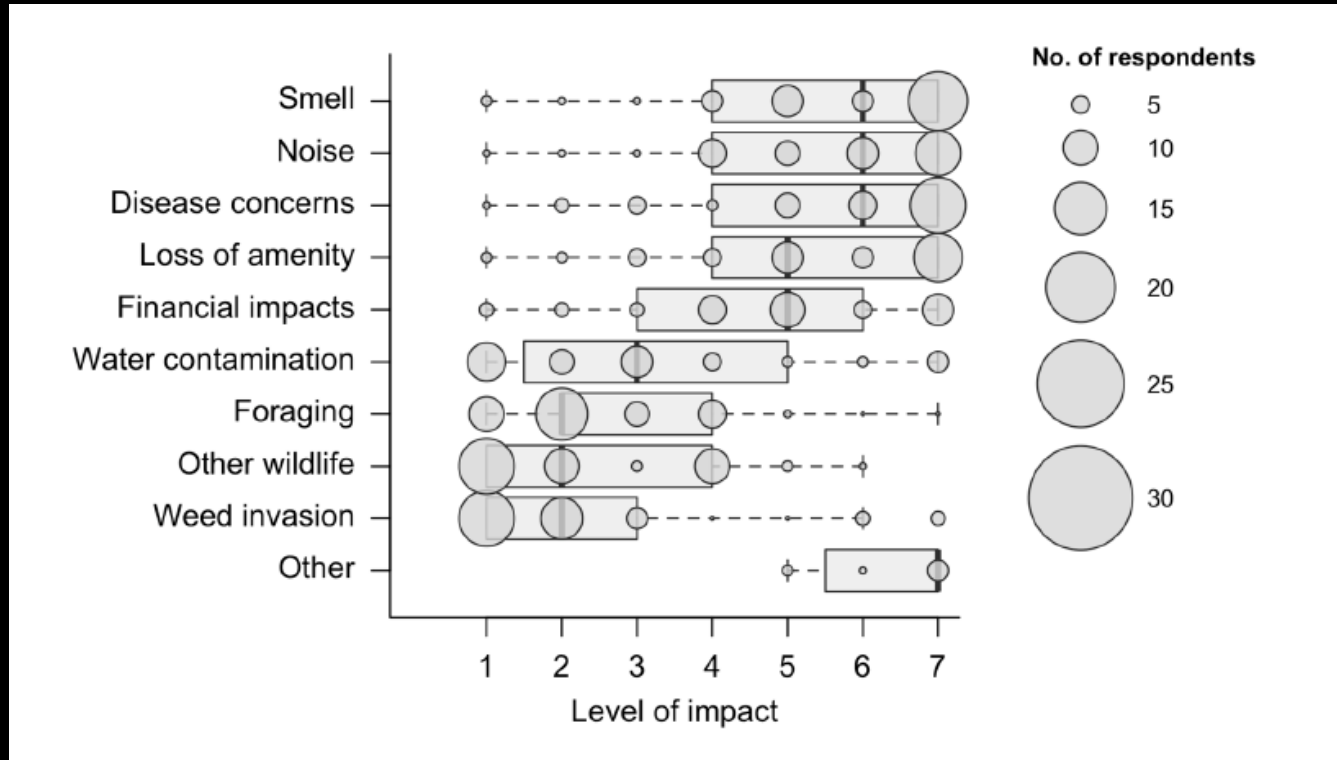
Francis Ratcliffe (1932)



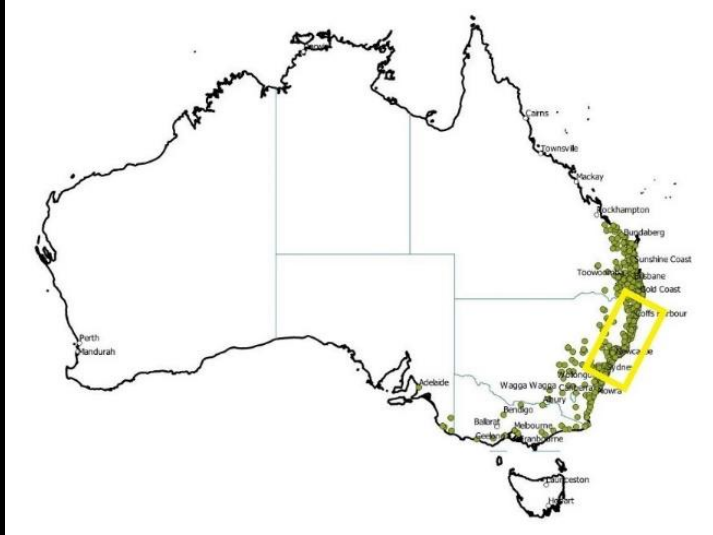
Pictures: (L):CSIRO (R) Francis Ratcliffe

- Ratcliffe, F. 1932. Notes on the fruit bats (*Pteropus* spp.) of Australia. *Journal of Animal Ecology*, 1, 32-57.

Perceived impact of flying-fox camps...



Study site:



Methods:

- We deployed instruments in the middle of the flying-fox camp for 24-hour periods
 - Songmeter SM2+
 - Datalogging SPL meter
 - Kestrel 4500 weather station
- Deployed (mostly) twice monthly (avoiding adverse weather) over a three year period 2013 - 2016
- 61 x 24-hour data sets



Picture: Tim Pearson

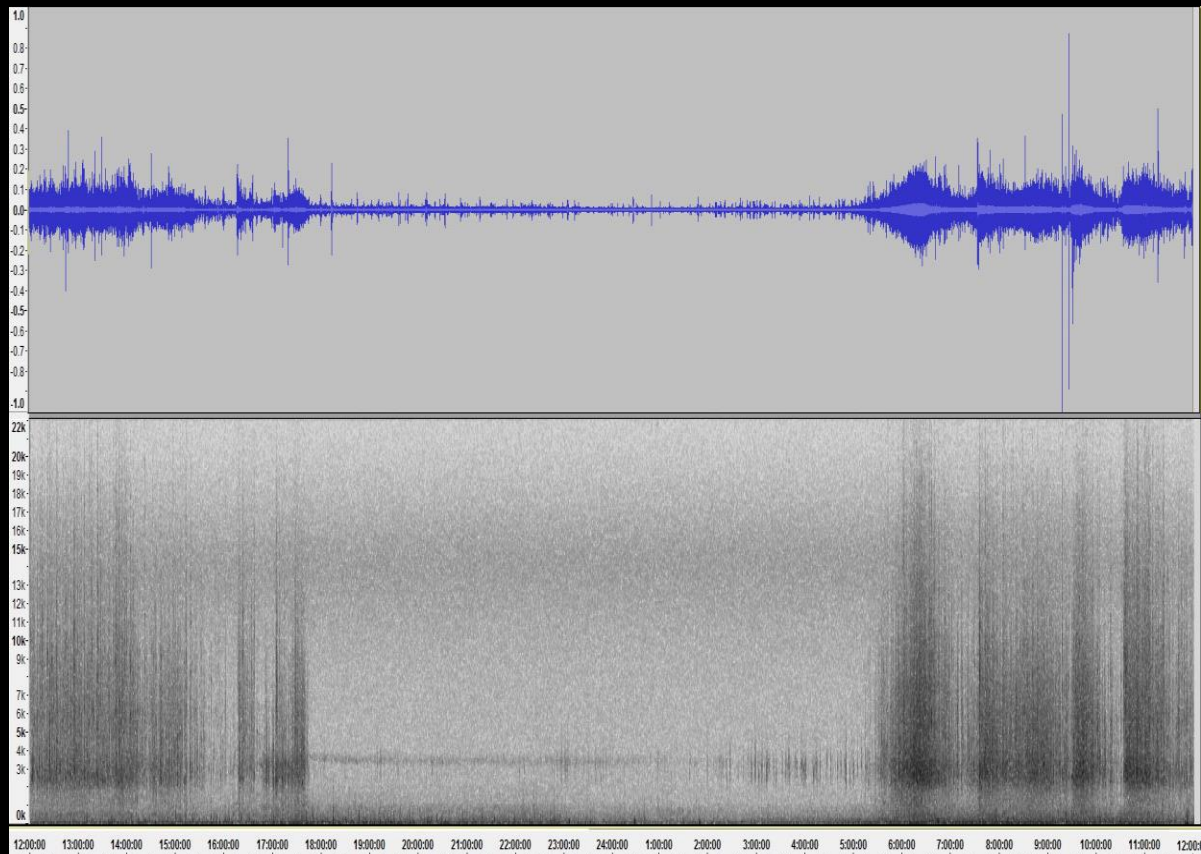


Picture: Viv Jones

A day in a flying-fox camp...

Audio:

24-hour recording from
SongMeter SM2+
48kHz, 16-bit
uncompressed stereo
wav file



A day in a flying-fox camp...

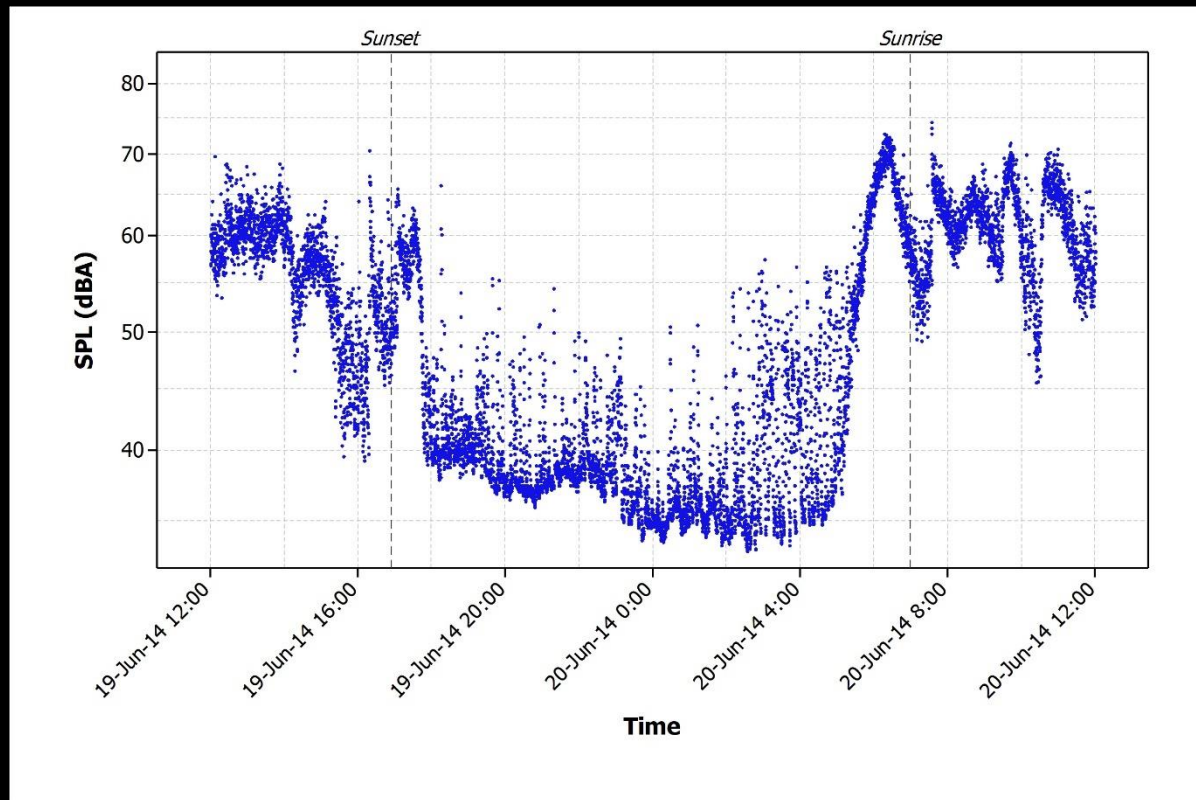
SPL:

24 hour sample

'A' frequency weighting

'Slow' time weighting

10-second sampling intervals



A day in a flying-fox camp with no bats...

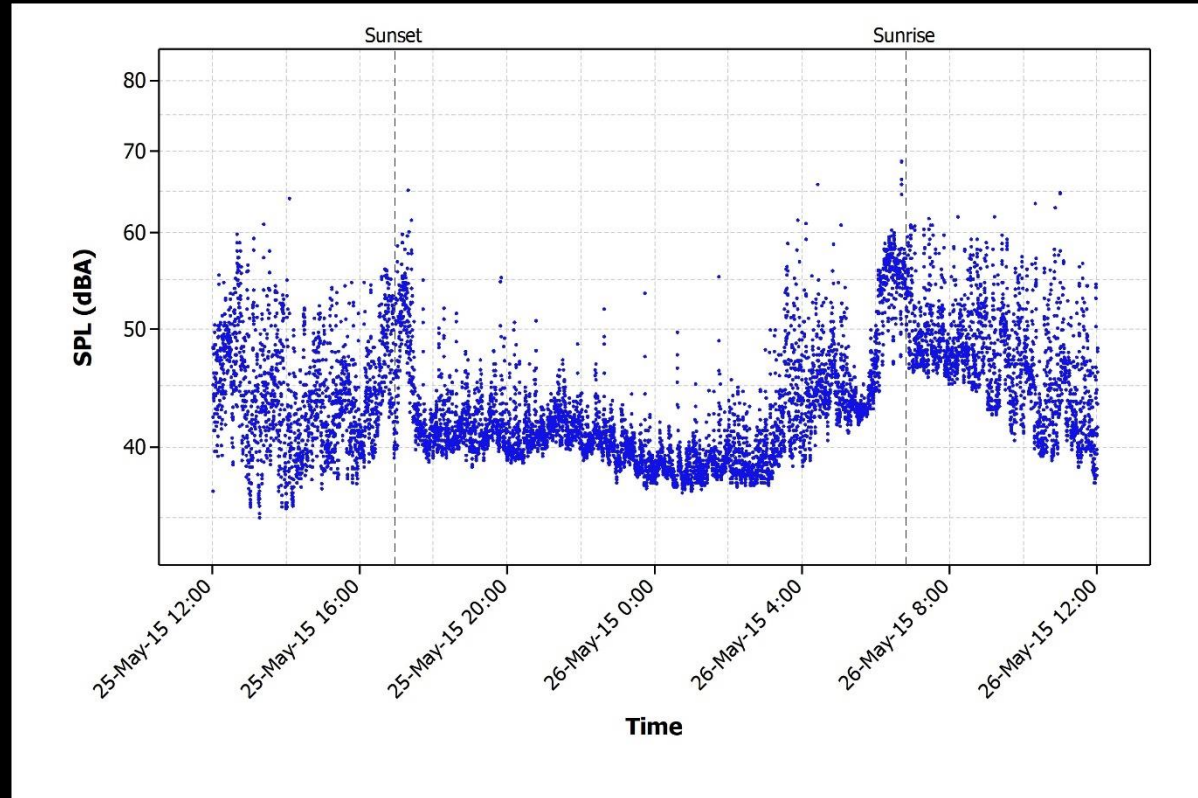
SPL:

24 hour sample

'A' frequency weighting

'Slow' time weighting

10-second sampling intervals

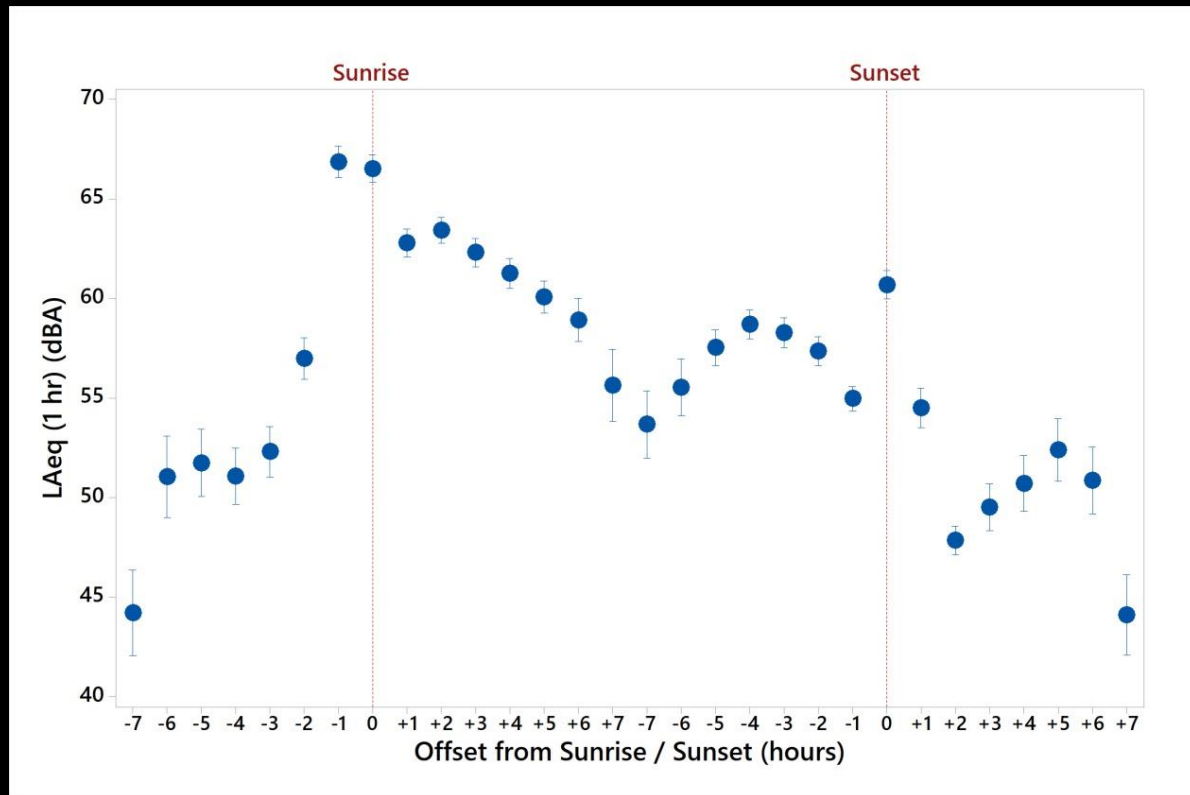


A day in a flying-fox camp...

SPL:

3 years data: Log-averaged sound levels in 1-hour bins, adjusted to show offset from sunrise/sunset

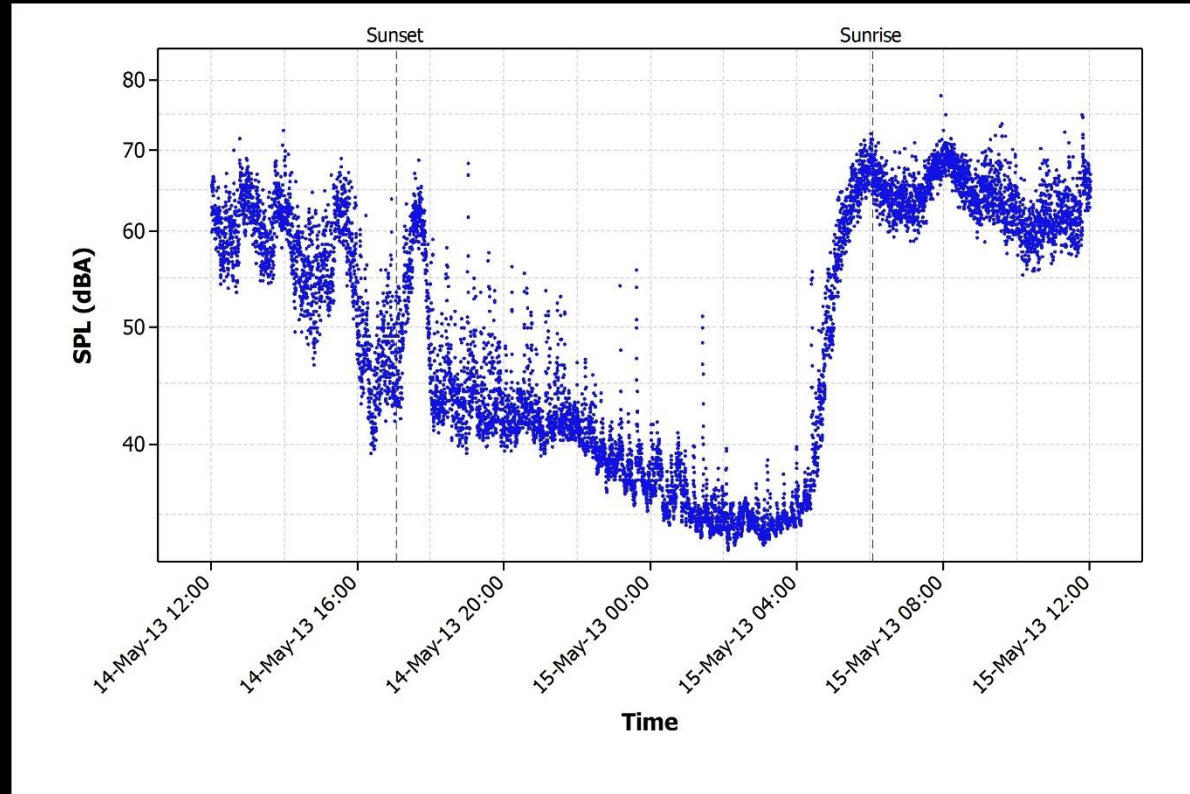
(Bars show standard error)



A year in a flying-fox camp...

SPL:

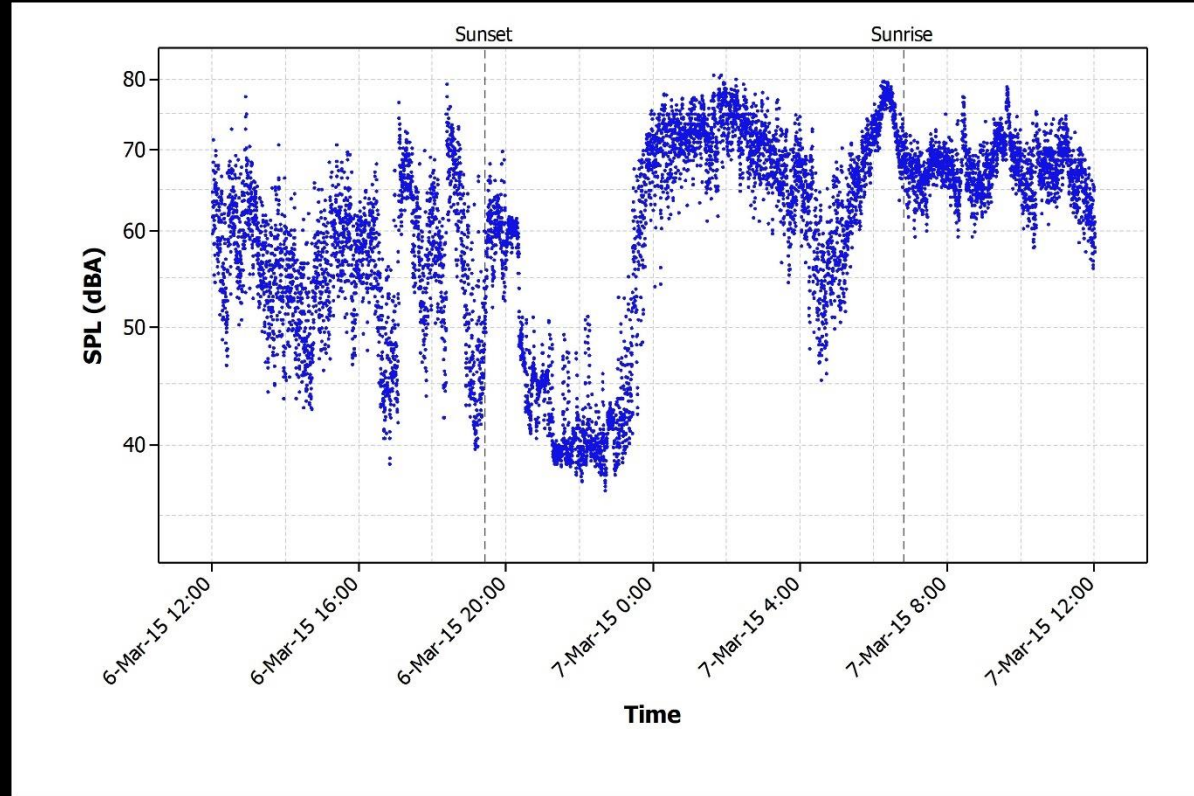
Typical day...



A year in a flying-fox camp...

SPL:

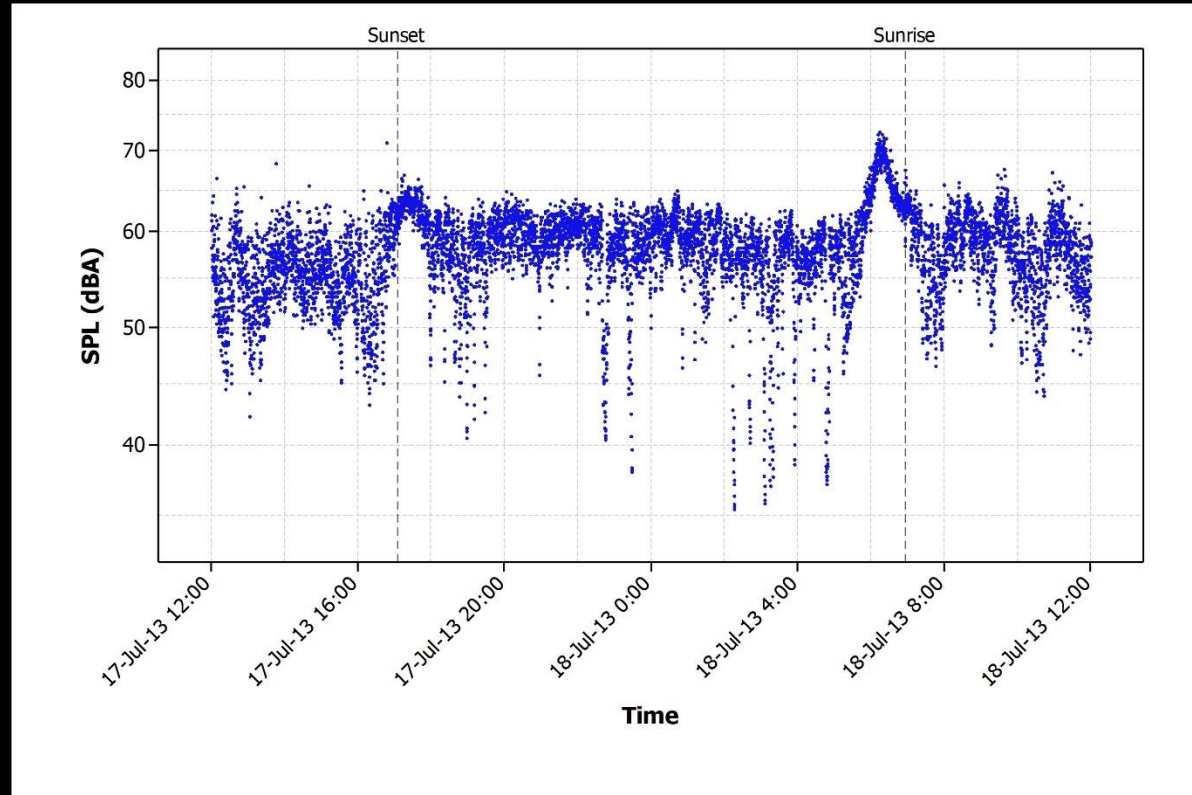
Mating season
(approximately 4-
weeks over March -
April)...



A year in a flying-fox camp...

SPL:

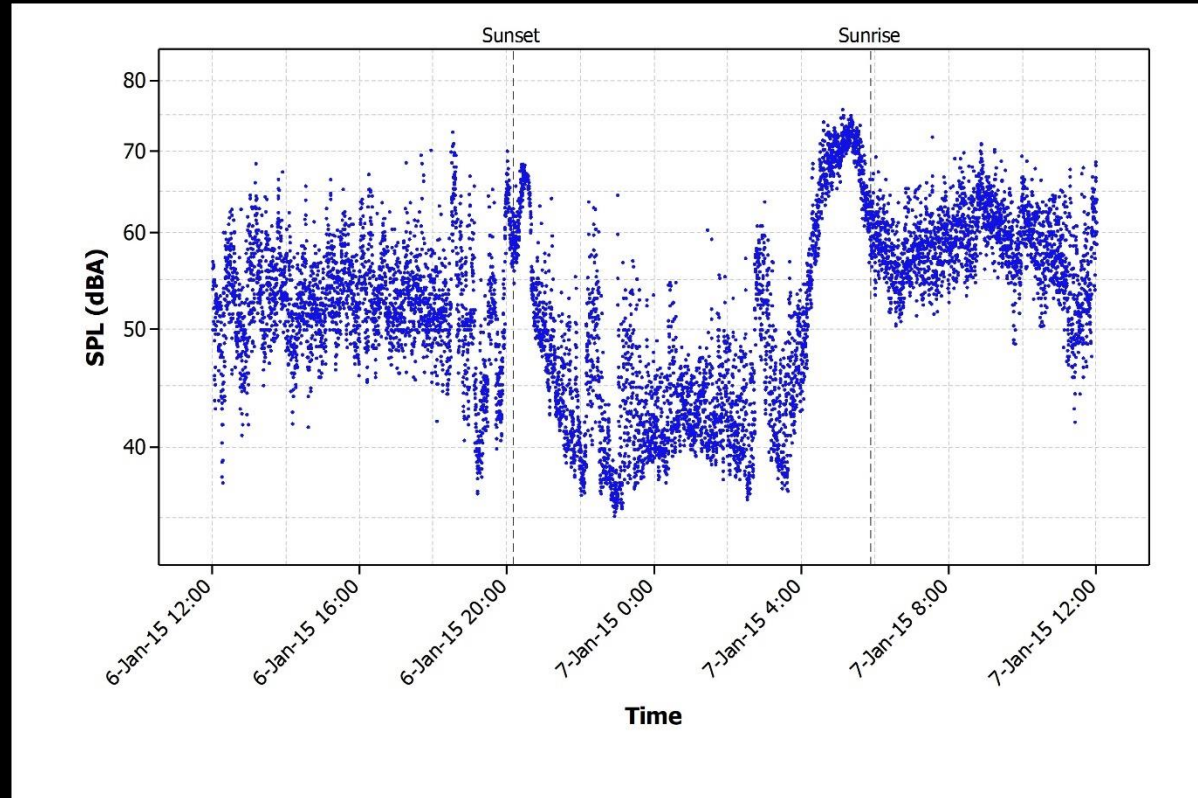
Winter...



A year in a flying-fox camp...

SPL:

Maternity season
(November-February)...

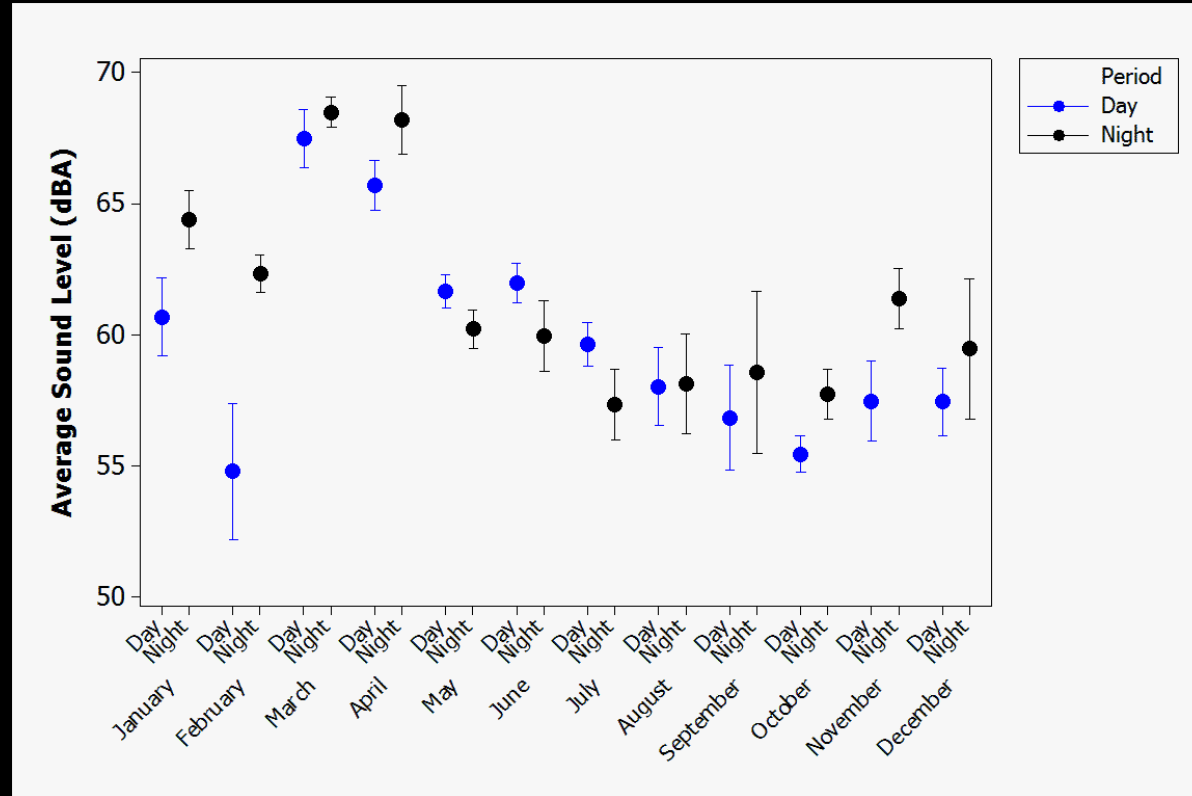


A year in a flying-fox camp...

SPL:

Using standard
daytime (0700 – 2200)
and nighttime (2200 –
0700) LAeq...

(Bars show standard
error)





Picture: Tim Pearson

Buffers:



Picture: Tim Pearson

Buffers:



Effectiveness of a 10m buffer:

- We used datalogging sound level meters and took sound level readings at 10- and 20- metre distances from the edge of the roosting bats in 20 locations around the flying-fox camp
- We found that the difference was consistently 2-3 dBA
- Not really enough to even be noticeable...
- But may have benefits for smell, mess, etc

Effects of building insulation...

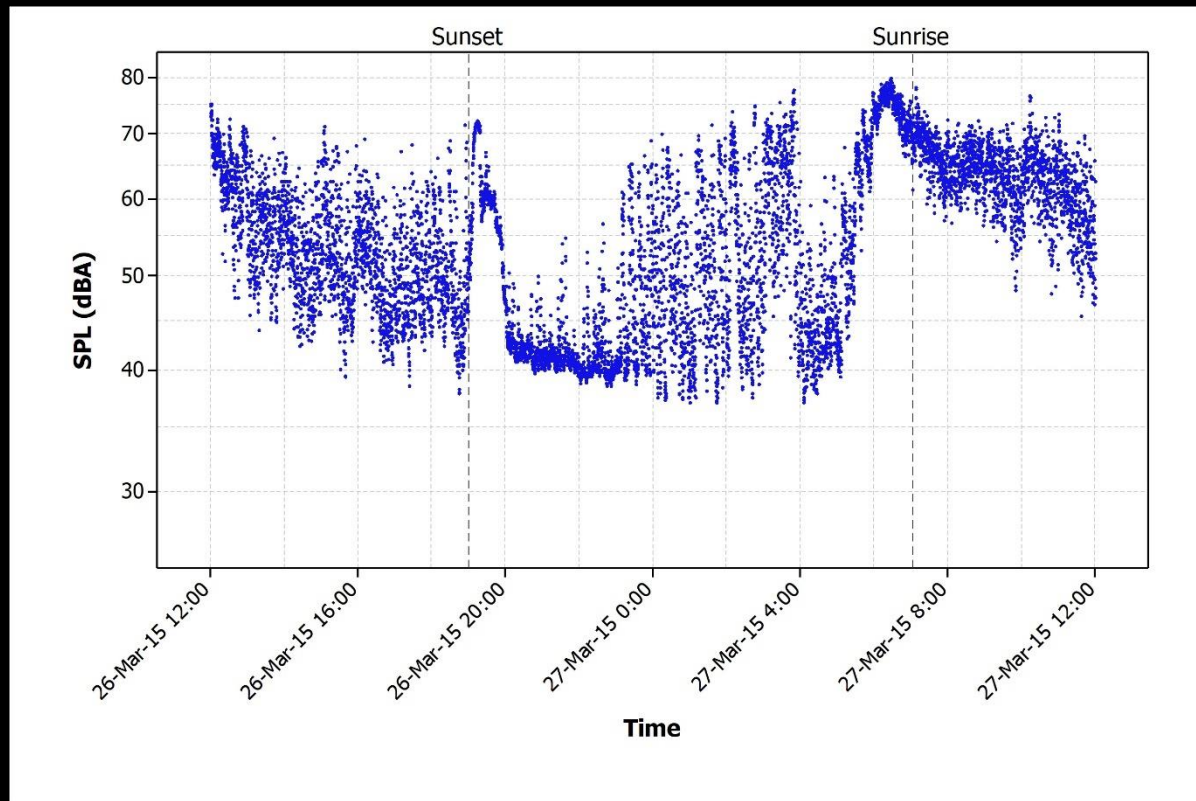
4 x simultaneous sets of SPL readings taken over a 24-hour period during mating season

- 1) Camp
- 2) 10m (balcony)
- 3) Room 1
- 4) Room 2 (insulated)



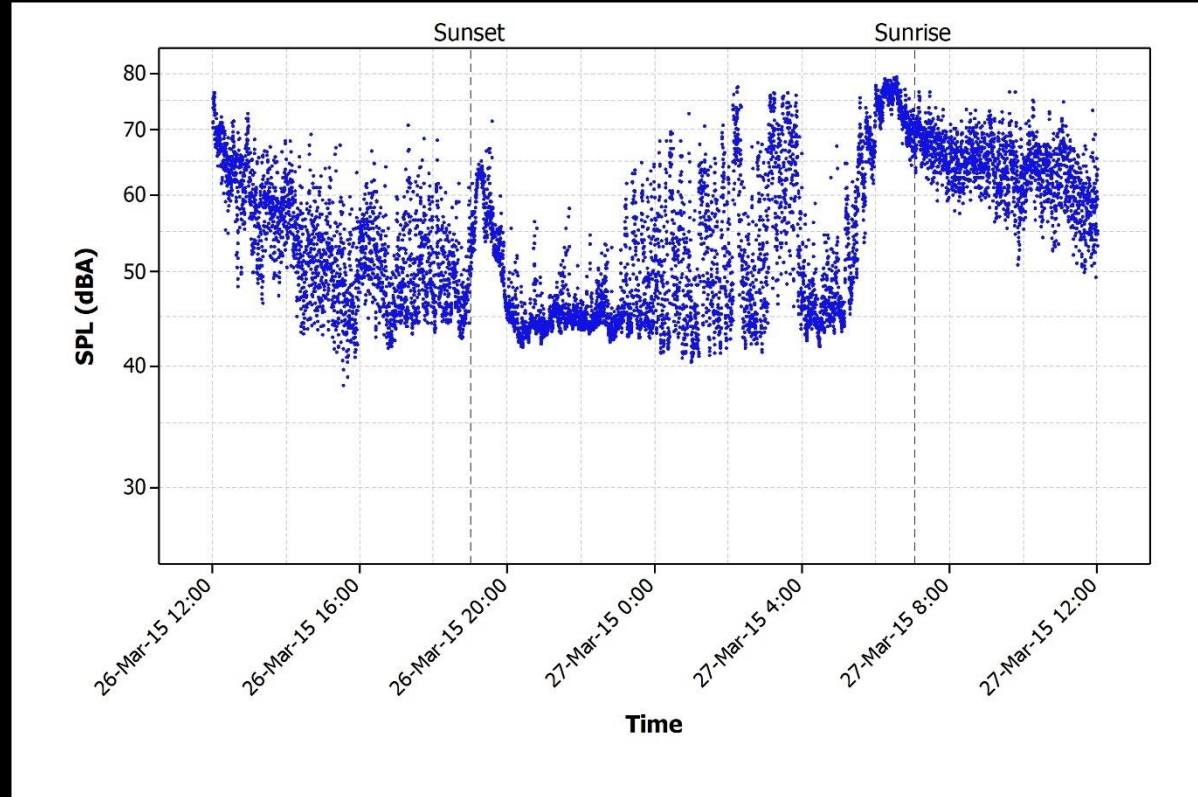
Effects of building insulation...

From middle of camp:



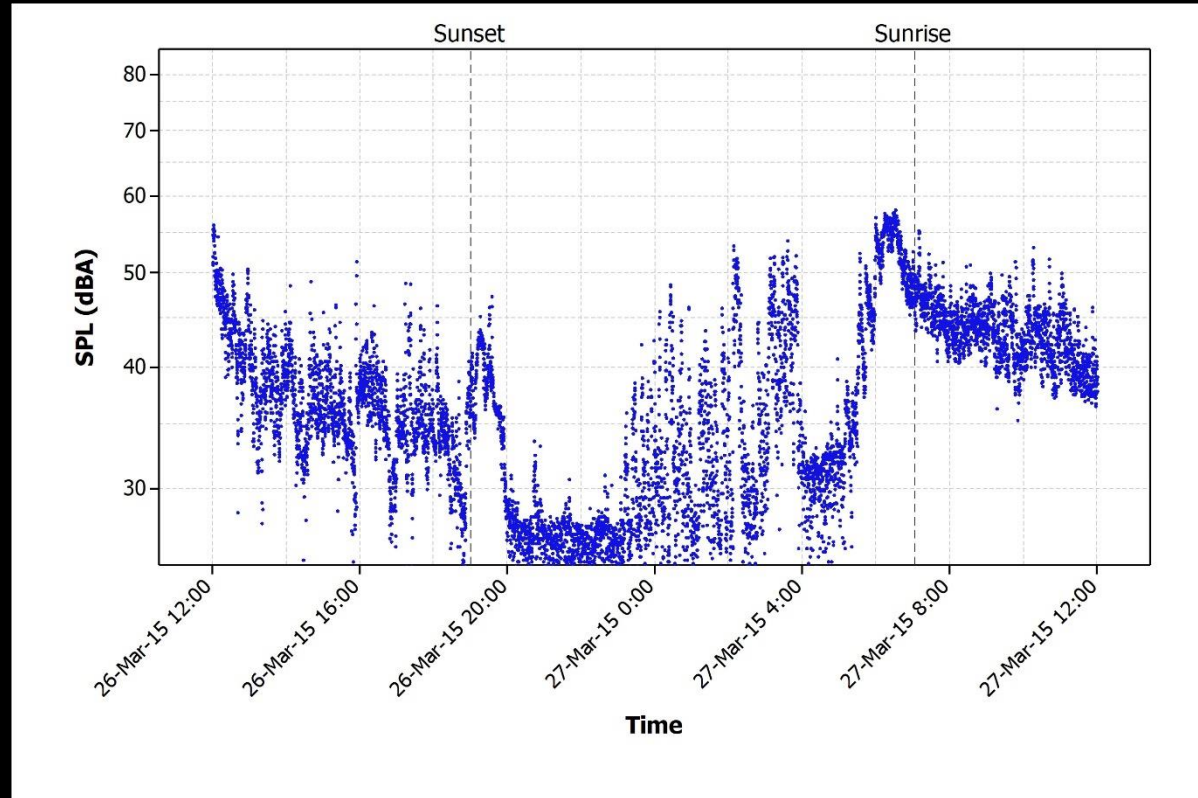
Effects of building insulation...

10m from camp (on property balcony):



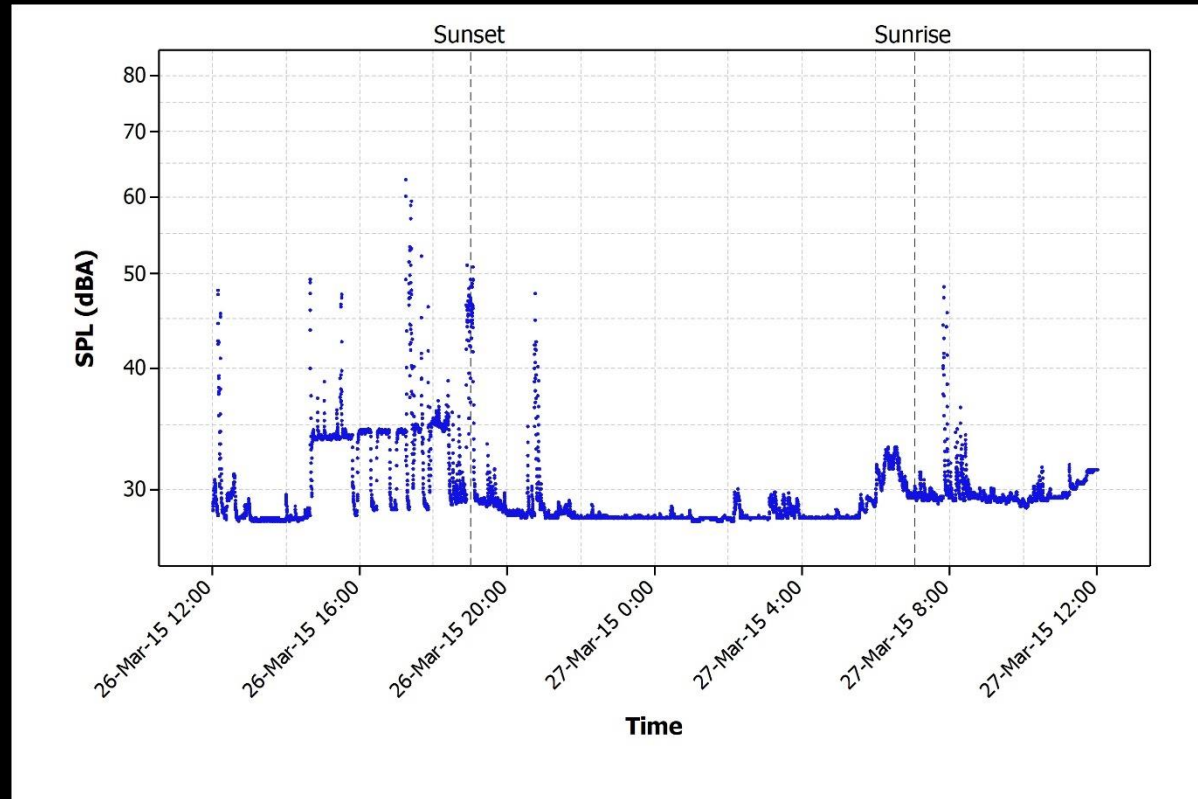
Effects of building insulation...

Inside dwelling, in
room with window
open:



Effects of building insulation...

Inside dwelling, in fully insulated and double-glazed room, with window closed:



Conclusions:

- “Noise” in a flying-fox camp is simply the sound of the animals communicating
 - It follows a distinct and consistent pattern
 - It varies consistently and predictably both daily and seasonally
- A 10-metre buffer zone makes very little difference to experienced noise levels (although it may help with other issues)
- Comprehensive home insulation makes a huge difference to noise levels (and probably smell)
- It makes far more sense to modify the built environment rather than the natural one

Thanks to: Ku-ring-gai
Council; and the Ku-ring-gai
Bat Conservation Society,
particularly Jocelyn Chenu.



Questions?