ABSTRACT: POSTER

Disturbance caused to cave-roosting bats during ecological monitoring: implications for researchers and cavers

AMANDA BUSH[1], LINDY LUMSDEN[1] PhD, YVONNE INGEME[2,3], CHRISTA BECKMANN[4] PhD, and PETER BIRO[4] PhD

Cave roosting bats are highly susceptible to human disturbance with the potential for significant impacts on population numbers and viability. Ecological monitoring is essential to determine status and population trends. However, it is critical that this monitoring does not have unintended negative impacts. Short-term disturbance to roosting bats can be readily apparent; however, long-term impacts from people entering caves is more difficult to assess.

The Critically Endangered Southern Bent-wing Bat *(Miniopterus orianae bassanii)* is an obligate cave roosting bat in south-eastern Australia whose population has significantly declined over recent decades. Regular monitoring is undertaken at two key maternity caves, but little is known of the use of key non-breeding caves. This study aimed to determine the relative numbers and seasonal patterns of bats using non-breeding caves. Daily estimates of relative activity were recorded in six caves over a two-year period, with the efficacy and potential risk of disturbance of this monitoring investigated.

Bat call recorders were set within or at the exit of caves to record relative levels of activity each night. The number of bat call pulses were tallied to obtain an index of nightly activity. Caves were entered once a month to change the batteries on the recorder, with one or two flash photographs quickly taken of the roosting bats to estimate numbers and help interpret the recorder results. Other light, noise and time spent in the cave were kept to a minimum. The bat call data revealed variation in activity reflecting weather and seasonal patterns. In addition, substantial activity spikes were observed following visits where flash photography was used. While some immediate increase in activity due to bats taking flight was expected, what was unexpected was that activity levels remained elevated for several weeks after the visit. As a result, flash photography has now ceased, resulting in reduced activity spikes after battery changes.

In an attempt to obtain accurate population estimates with minimal disturbance, remote, time-lapse, infrared cameras are now being used. These cameras are completely covert, producing no visible light or sound. They are set opposite roosting bat colonies and take a photograph once an hour for three to four months, between battery replacements. This reveals population estimates, activity patterns and roosting behaviour. These findings have implications for bat researchers, cavers and members of the general public entering bat caves, with disturbance potentially having an impact long after people have left the cave.

Presented at the 17th International Congress of Speleology — Speleo 2017

1 Arthur Rylah Institute, Department of Environment, Land, Water and Planning,

2 Department of Environment, Land Water and Planning,

3 Victorian Speleological Association and Australian Speleological Federation,

4 Centre for Integrative Ecology, School of Life and Environmental Science Deakin University