ABSTRACT: POSTER

Monitoring a bat maternity cave in south-eastern Australia using remote technology

YVONNE INGEME[1,3], AMANDA BUSH[2], LINDY LUMSDEN[2] PhD, and RETO ZOLLINGER[3]

The Critically Endangered Southern Bent-wing Bat (SBWB) *Miniopterus orianae bassanii* is restricted to south-eastern Australia, where its numbers have declined significantly in recent decades. It is an obligate cave-dwelling bat with two known key maternity caves, one in south-western Victoria and the other in south-eastern South Australia. Little is known about what makes these caves suitable as maternity sites or how microclimate, seasonal conditions and environmental triggers influence the SBWB breeding cycle. This information is critical to effectively manage the bats and their cave environment. In addition to monitoring the bat population using bat detectors, which sample relative activity every night, more detailed data is now being collected using three remote, covert, infrared, time-lapse cameras in one of the birthing chambers, taking a photograph every hour, and two temperature and humidity dataloggers (Hydrochron ibuttons) collecting hourly microclimatic data. The bat detector, infrared camera and dataloggers can remain in place for up to four months between battery changes, enabling long term sampling.

The Victorian maternity cave has several entrances that allow air to circulate. One of the birthing chambers is within a bell hole approximately two metres above the cave floor. The infrared cameras reveal highly synchronised birthing patterns. In 2015, the first pups were born on 2 December, the main birthing commenced in the early hours of 3 December with the majority of pups born by 4 December. Females then transferred their pups to another bell hole within a larger (40-metre high) more open chamber by 8 December 2015.

The temperature and humidity dataloggers revealed how and when the bats modified their microclimatic environment, while the cameras provided detailed corresponding information on the number of bats in this bell hole. Data collected over a four-month period indicate that while adult bats are clustering within the birthing chamber, they increase the temperature around the pups by up to 17.0˚C above ambient cave temperature, to a maximum of 33.1˚C. They also influence humidity by lowering RH from 99.6 within the cave to a minimum of 72.8 around the pups. The remote cameras and dataloggers show great promise as non-invasive techniques enabling detailed, hourly monitoring of bat numbers and their behaviour, as well as the microclimatic conditions within their roosts, with minimal disturbance to the bats.

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1 Department of Environment, Land Water and Planning

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

3 Victorian Speleological Association and Australian Speleological Federation