

Flood recovery: tracking the South-eastern Long-eared Bat in Gunbower

Confirming a range extension in Victoria for this threatened microbat

June 2024

Key Messages

- We confirmed the presence of a population of the Vulnerable South-eastern Long-eared Bat in north-central Victoria.
- In this area this species uses various roost types in relatively narrow-diameter box eucalypt trees and has flexible roosting requirements.
- The use of acoustic lures appears to increase trapping success for the species.

Victoria is home to insect-eating microbats that roost in tree hollows, and which can be difficult to survey because they are nocturnal and cryptic. We set out to learn more about the population of a threatened microbat species that may have been impacted by recent flooding events.

The South-eastern Long-eared Bat

The South-eastern Long-eared Bat (*Nyctophilus corbeni*) is a threatened (Vulnerable FFG Act) insectivorous microbat that is dependent on tree hollows for roosting. Its Victorian distribution was believed to be limited to a small population in Victoria's north-west, in the mallee, until a lactating (i.e. breeding) female was captured at Gunbower National Park in late 2021. This area was heavily impacted by flooding events that occurred in late 2022 and early 2023.

It was unknown to what extent this species would use flooded riparian woodlands, what tree species it would use for roosting in this area, or if it would have been impacted by the loss of hollow-bearing trees following the floods. The extent of gene flow between this population, and populations in the Victorian mallee and to the north in New South Wales, are also unknown.

At present this species cannot be surveyed using acoustic methods, because its calls cannot be distinguished from those of two other co-occurring long-eared bat species.

Project aims

- To conduct harp trapping studies to confirm whether there is an established population of the South-eastern Long-eared Bat in Gunbower National Park;
- To collect reference calls from the target and other microbat species, to assist in the development of call recognisers;
- To collect genetic material from this new population; and
- To radiotrack South-eastern Long-eared Bats to their roosts, to characterise the types of trees and cavities they are using.



Survey methods

In March 2024, we conducted eight nights of harp trapping surveys. We also set acoustic lures (the Autobat, specifically designed for this species, and generic high-frequency bat chirpers) with some of the traps to increase trapping effectiveness. We took genetic samples (a wing biopsy punch) and collected reference calls from any captured South-eastern Long-eared Bats, and fitted them with radiotransmitters. We also collected reference calls from a range of other species that we captured. Bats with radiotransmitters were tracked back to their roosts during the daytime.

Study Area

To assess the potential distribution of the South-eastern Long-eared Bat within Gunbower National Park, we trapped at Cameron's Creek, Baggot's Creek, and Emu Hole (Figure 1), which are to the south-east of the 2021 capture record.

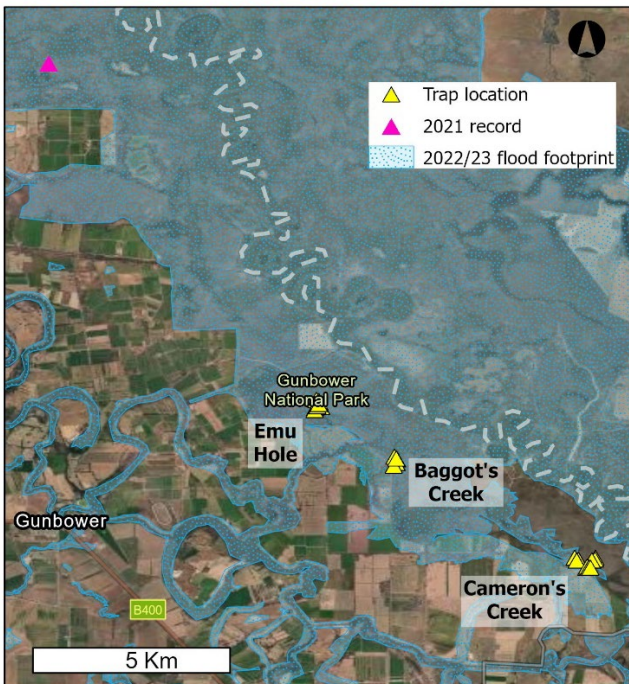


Figure 1: Microbat harp trapping locations within Gunbower National Park, north-central Victoria.

Results

We captured 172 microbats, representing 10 species, in our trapping surveys, including five individual South-eastern Long-eared Bats. One male South-eastern Long-eared Bat was captured at Cameron's Creek (Figure 2), and a further four (two males, two females) at Baggot's Creek.

The most commonly-captured microbat species were Gould's Wattled Bats (*Chalinolobus gouldii*, 39 individuals) and Little Forest Bats (*Vespadelus vulturnus* (39 individuals), followed by the Southern Free-tailed Bat (*Ozimops planiceps*, 28 individuals),

Lesser Long-eared Bat (*N. geoffroyi*, 17 individuals), and Chocolate Wattled Bat (*C. morio*, 14 individuals).

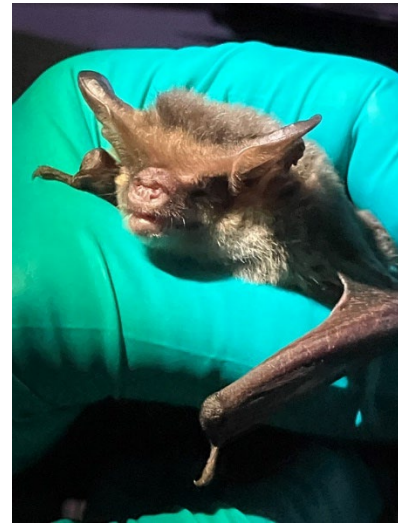


Figure 2: A South-eastern Long-eared Bat captured at Cameron's Creek. Photo: Jemma Cripps.

Of the traps deployed, 33 had a chirper, 28 did not have any lures, and 12 had an Autobat deployed with them. By proportion, the traps with the Autobat captured substantially more bats than both the traps with the chirpers and the traps without lures (Figure 3).

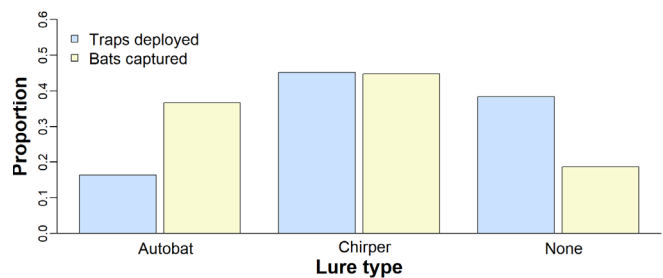


Figure 3: Relative success rates of traps. Blue bars show the proportion of traps set with different types of lures, and yellow bars the proportion of all trapped bats that were captured in each of these.

Extensive searching was required to locate the bats carrying radiotransmitters due to the short range of the unit's signals. The team drove or walked 168 km of roads and through woodlands over eight days to locate South-eastern Long-eared Bats in their roosts. While the bat captured at Cameron's Creek could not be relocated, the four individuals from Baggot's Creek were successfully tracked to six different roost trees. Roosts were in or on narrow-diameter (19.5 – 36 cm DBH) and multi-stemmed Grey Box (*Eucalyptus microcarpa*) and Black Box (*E. largiflorens*) trees (Figure 4). The bats appeared to be using a range of roost types including hollows, fissures, spouts, and roosting under bark, though for some individuals it was difficult to tell exactly where in the tree the bat was located. The bats used these roosts for one or two nights, before moving to a new roost.



Figure 4: A Black Box (*E. largiflorens*) being used as a day roost by the South-eastern Long-eared Bat. Photo: Jemma Cripps.

Conclusions

We confirmed that there is a population of South-eastern Long-eared Bats persisting in the area of Gunbower National Park that was flooded in 2022/23. If we assume that it is one contiguous population occupying the park, and consider both the area used by bats in this project along with the capture location from 2021, then this population occupies at least 45km². However, it is unclear just how far up- and downstream along the Murray River this population extends, how many individuals it comprises, and how genetically connected it might be to either the Victorian mallee or NSW populations.

Despite there being an abundance of large, old, and presumably hollow-bearing River Red Gums in our study area, the South-eastern Long-eared Bats that we tracked were instead recorded roosting in relatively narrow-diameter Black Box and Grey Box trees, and both of these species are broadly distributed throughout the Murray-Darling Basin. This adds to evidence from New South Wales that suggests that the South-eastern Long-eared Bat is fairly flexible in its roosting requirements, and in these floodplain woodlands, is likely not limited by the availability of hollow-bearing trees (though this may differ in other habitat types). Instead, the species' sparse distribution is likely to be driven by other processes and threats, such as competition, predation, and the availability of prey.

Recovery Outcomes

Through this project we have:

- Confirmed that there is a population of South-eastern Long-eared Bats persisting in the area around Gunbower National Park.
- Learnt about the roosting behaviour of this new population during the non-breeding season, and found it to be flexible in its roosting requirements.
- Demonstrated that, where possible, future surveys for this species should make use of acoustic lures to increase trapping success.
- Collected genetic material from five South-eastern Long-eared Bats, and reference calls from 50 bats including the target species but also Lesser Long-eared Bats, Gould's Long-eared Bats (*N. gouldi*), Little Forest Bats, and 'high frequency' Southern Forest Bats (*V. regulus*).

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Banner Photos: Jemma Cripps

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We acknowledge Victorian Traditional Owners and their Elders past and present as the original custodians of Victoria's land and waters and commit to genuinely partnering with them and Victoria's Aboriginal community to progress their aspirations.

