



focus on **NRM** research

Designing the non-cotton landscape: to optimise eco-system services

Sean Freney, Dr Erin Peterson, Dr Susan Fuller, QUT

Bats provide valuable benefits to the Australian cotton industry through pest suppression. Sean Freney, a QUT Honours student working with Drs Susan Fuller and Erin Peterson, is investigating whether the presence of remnant vegetation patches and vegetation corridors along creeks and roads increase on-farm bat activity.

Ultrasonic acoustic sensors were deployed at eleven sites on cotton farms near Narrabri NSW with the help of Stacey Vogel (CottonInfo) and the local growers. The sensors were set up in four different cotton landscapes: cotton monoculture, cotton adjacent to road corridors, cotton adjacent to creek corridors and cotton adjacent to remnant vegetation. Bat calls were recorded over four nights and a total of 4969 calls from 10 different taxa were identified.

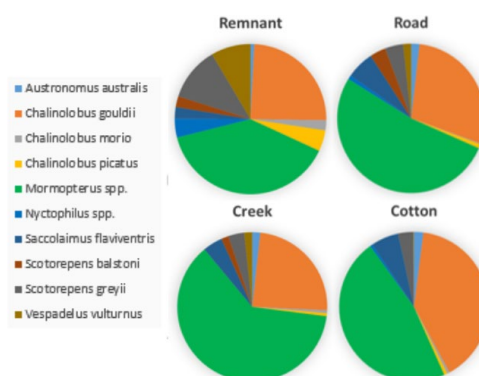
Analysis of the data showed significantly less bat activity in the cotton monoculture sites compared to those in cotton adjacent to vegetation corridors and remnant vegetation patches, which had the highest bat activity. There results also showed differences in the diversity of bats found in the different cotton landscapes, with the most diversity found near remnant vegetation (Figure 1).

The most common bat taxa found across all sites were those from the genus *Mormopterus*, which includes a number of free-tailed bat species with similar calls. These bats are insectivorous and include species such as the Bristle-face free-tailed bat (*M. eleryi*), which is found in riparian and floodplain woodlands; the southern free-tailed bat (*M. planiceps*), which feeds along the edges of forest

vegetation and roads; and the Rides free-tailed bat (*M. ridei*), which feeds extensively on agricultural pests (e.g. *Hemiptera*), among other species. The most common bat species found across all four cotton landscapes was Gould's Wattled Bat (*Chalinolbus gouldii*), which feeds on moths and is a common occupant of bat boxes.

The results of this study adds to a growing body of evidence that native vegetation plays an important role in integrated pest management. It may also be possible to strategically “design” vegetated areas on cotton farms to promote bat activity and optimize on-farm ecosystem services.

Figure 1. Acoustic monitoring revealed that bat diversity differed in four cotton landscapes: cotton near remnant vegetation patches (Remnant), cotton adjacent to vegetation corridors along roads (Road), cotton adjacent to vegetation corridors along creeks (Creek), and cotton monocultures (Cotton).



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