

Habitat restoration and the bell miner: how do they respond?

Proposed Honours project

Project supervisor: Dr Paul G. McDonald (UNE) (paul.mcdonald@une.edu.au)

Co-supervisor: Dr Kathryn Lambert (UNE) (klamber4@une.edu.au)

Introduction

The bell miner, *Manorina melanophrys*, is a cooperatively breeding honeyeater that defends territories from other avian species to the point of complete exclusion within territory boundaries (Leseberg et al. 2014). This species has also been implicated in a form of eucalypt dieback, that incorporates a multi-trophic interaction between trees, psyllids, a leaf parasite that feeds primarily on juvenile eucalypt leaves (Stone 1996), and their avian predators, the bell miner. The bell miner feeds primarily on lerp, a sugary coating that psyllids produce for protection rather than the underlying insect itself (Haythorpe and McDonald 2010). Two studies where bell miner colonies have been removed from Olinda State Forest in Victoria and a forest in Queensland in order to assess the changes in the avian assemblages and tree health have found conflicting results (Loyn et al. 1983, Clarke and Schedvin 1999). An inundation of other insectivorous bird species that feed upon and reduce psyllid populations was evident in both studies. However, Loyn et al. (1983) observed an improvement in tree health, whereas Clarke and Schedvin (1999) did not. Clarke and Schedvin (1999) suggested the reason behind the difference in tree health was due to the presence of *Phytophthora cinnamomi* (a pathogenic fungus). As suggested by a recent study on Bell Miner Associated Dieback in wet sclerophyll forest in New South Wales, a reduction in tree health can be caused by a variety of stressors, not just bell miners (Lambert 2015). This species has been found to have nest plasticity and does not always respond to understorey removal (Lambert 2015), as previously suggested to result in colony relocation (Somerville et al. 2011). A colony expansion has only been observed once with two types of groups, a breeding pair and a helpers and a group of unmated males. Both groups were unsuccessful and returned to the original colony after six months (Dare et al. 2008).

Furthermore, despite the studies already undertaken, little is known about the reasons behind their habitat choice and reasons for dispersal. In order to better understand the relationship between bell miner activities and the potential for them to contribute towards tree dieback, and the reasons behind any dispersal and colony movements that may occur, it is necessary to determine how this species responds to habitat restoration through the removal of weed species such as *Lantana camara*. A previous preliminary study that compared the response of two colonies that had *Lantana* removed from their understorey as a dieback treatment. Lambert et al. (2016) suggested that the colony response was due to the difference in understorey growth of native rainforest species. However, this study was only based on two colonies so the response of the species to habitat restoration is largely unknown.

A project in this area might investigate links between the presence of a midstorey, no understorey and *lantana* removal in association with colony presence. Additionally, the project will determine if bell miners will still nest in the understorey that replaces *Lantana*, regardless of the plant species.

References

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