IMPROVING MAMMALIAN REINTRODUCTION SUCCESS IN THE AUSTRALIAN ARID ZONE

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Thesis Declaration

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Abstract

The Australian arid zone has the highest recent mammal extinction rate in the world with most species in the critical weight range of 35 g to 5.5 kg now regionally or globally extinct. Reversing arid zone mammal decline has become a major focus for conservation organizations and reintroduction programs are a common tool in species recovery. Unfortunately, reintroduction success in Australia is low and predation from introduced cats and foxes is commonly cited as the cause of reintroduction failure. In this thesis, I aimed to improve reintroduction success in the arid zone by exploring predation, release protocols and post release abundance at the Arid Recovery Reserve in northern South Australia. Firstly, I attempted to reintroduce threatened mammal species into both a predator free area and one where predators were controlled. Results suggested that successful reintroductions only occurred when cats and foxes were excluded. I then tested different predator reduction strategies to determine if reintroduction success could be improved, including aerial baiting, strategic bait placement and the use of a native top-order predator. Although the use of dingoes to control foxes and cats showed promise, I was unable to improve reintroduction success using poison baiting as it did not significantly reduce feral cat abundance.

I investigated the role of release strategies on reintroduction success and conducted predator avoidance training, soft and hard releases and using captive versus wild stock. Predator avoidance training did not assist long term reintroduction success of the bilby but some behavioural differences were detected. Results suggest that Australian arid zone species may be able to learn predator avoidance behavior but this may not necessarily translate into improved reintroduction outcomes. The use of soft and hard releases and captive and wild stock had little effect on reintroduction success when cats and foxes were excluded. Interspecific differences in post-release mortality and behaviour indicated that soft releases may be useful at unrestricted release sites, in situations of high predation risk and where social, sedentary species which invest heavily in their shelters are being released.

Finally, I analysed long term monitoring data for four reintroduced threatened species to determine whether factors such as rainfall, time since release or temperature influenced post-release population fluctuations. Factors significantly influencing abundance included the Indian Ocean Dipole and temperature. Time since release was still the most important factor influencing abundance even 10 years after release indicating that reintroduced populations may not stabilize for decades and long term monitoring is essential.

Regardless of reintroduction protocols, new methods of broadscale cat control are required before broadscale reintroduction success can be improved in the Australian arid zone. Present control methods are insufficient to enable successful reintroductions of cat-sensitive mammal species without exclusion fencing. However, exclosures are relatively small and expensive, and can create problems such as overstocking. Future arid zone reintroductions should focus on broadscale reintroductions without fences to ensure widespread recovery but this will require the development of improved cat control methods. Species-specific predator thresholds are also needed to trigger management actions and improve the predictability of reintroduction outcomes.