

Oryx

Settling in: brushtail possum diet following reintroduction

By Hannah Bannister & Katherine Moseby, 25th June 2020

Over the last few centuries global populations of many species have significantly declined. With 30 mammal species declared [extinct](#) since the arrival of Europeans in 1766, the Australian fauna is no exception. The introduction of foxes and feral cats to the country has been one of the major drivers of this decline, along with habitat loss and alteration. In some areas, feral predators have been successfully controlled on a local or regional scale. This has created opportunities to reintroduce species that have disappeared from parts of their range but still survive in others. However, many reintroductions fail. This means that intensive monitoring, and treating reintroductions as experiments, are essential to understand the potential success of these interventions better.



Left: A brushtail possum is released into the Ikara-Flinders Ranges National Park, marking their return after an absence of over 60 years. Photo: Tali Moyle. Right: Possums continued breeding throughout the translocation, and many offspring were radio-tracked, to determine their fate. Photo: Hannah Bannister.

Reintroduced animals typically have a settling period. This is a time in which they lose weight and move around as they try and find the most suitable place at the release site in which to settle. Animals are often considered to have settled when their movements become more stable (i.e. they stop making unidirectional long-range movements), their weight stabilizes or increases and they begin to breed. One factor that is not often considered as an indication of settling time is what they are eating: it is usually inferred that if animals are a healthy weight and breeding then food resources are sufficient. However, the time taken for released animals to find suitable and preferred food should be considered part of this settling period.



A brushtail possum in a river red gum *Eucalyptus camaldulensis*. Eucalypts were one of the most highly consumed plants.

In 2015, brushtail possums were [reintroduced](#) to the Ikara-Flinders Ranges National Park in semi-arid South Australia. Brushtail possums are a medium size (1.5–4 kg) predominantly herbivorous marsupial, endemic to Australia (and introduced to New Zealand). Possums had become locally extinct in the area in the [1940s](#), with predation by foxes considered to be one of the key factors responsible for their decline. Within the Park, foxes have now been successfully controlled for more than 20 years under the [Bounceback Program](#), and managers wanted to reintroduce the brushtail possum. As part of our post-release monitoring, we examined individual possum movement, weight trends and breeding. We also decided to monitor the possums' diet for 12 months after release, to see whether this matched other settling parameters. The brushtail possum has largely disappeared from the arid and semi-arid regions of Australia, and we hoped that the diet of the reintroduced possums would provide some insight to their historic diet prior to local extinction, but noting that some of their purported favourite species may no longer be present.



River redgums provide both food and shelter (in tree hollows) for brushtail possums, and their movements within the Park often follow the river redgum lined creeklines. Photo: Hannah Bannister.

We collected possum scats and conducted vegetation surveys monthly for 12 months following release to compare what the possums were eating with what was available at the time. We found that although typical settling parameters such as movement, weight and breeding were achieved relatively **quickly** (0-6 weeks), the diet did not stabilize relative to availability during the 12 month period. Dietary richness and diversity continued to decline over the 12 months, presumably as possums were able to locate their preferred food plants and thus consume a higher volume of fewer favoured species.

Initially, possums probably had to be less picky about what they ate as they did not know where to find their favourite foods. However, the lack of dietary stability did not hamper reproduction: females continued producing joeys from the time of release and **throughout** the project, and thus not impacting reintroduction success in the short term. Under drought conditions, diet may play an increasingly important role in supporting healthy body weight and reproduction, and continuing our monitoring into and through a drought may show an increased reliance on quality food plants.

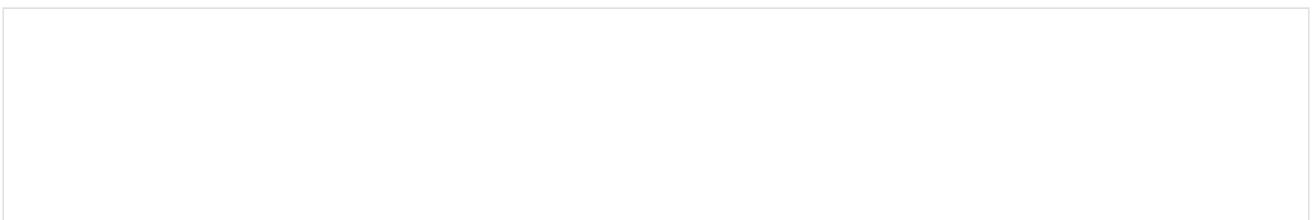


Sunrise while checking possum traps. Photo: Hannah Bannister.

Our [results](#) show that settling periods may be longer than those identified using movement, weight and breeding data and that diet may be the last thing to stabilize after release. Monitoring dietary changes after release may provide early warning signs of threats to future population viability or possible ecological impacts of the reintroduced species on in situ species. For example, an increasing amount of a particular species in the possums' diet over time (taking into account seasonal availability) may suggest that it takes longer for possums to find this preferred, but locally rare, plant. This could trigger management interventions such as establishing exclosures to protect these plants from overgrazing and/or planting these species to ensure quality foods are available for possums during droughts.

Our study highlights the adaptability of brushtail possums and will aid in planning future reintroductions. It provides reintroduction biologists with new questions to ponder, challenging conventional reintroduction monitoring protocols.

The article [Time to adjust: changes in the diet of a reintroduced marsupial after release](#) is available in *Oryx*—The International Journal of Conservation.





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