

Can bandicoots return to Mornington?

QUEST TO BRING THE SOUTHERN BROWN BANDICOOT BACK TO THE PENINSULA

By Eve Kelly

I AM HIKING up a steep incline into a woodland, just past Stockley's Creek where an easy-going emu is foraging for aquatic plants. Below the ridge is a dense woodland of swamp and manna gums, black wattle and ferns.

A procession of brown thornbill and eastern yellow robin follow, taking advantage of the insects I kick up on the trail. The Bunurong people of the Mornington Peninsula would have fished and hunted in these parts, surrounded by koala, eastern grey kangaroo, swamp wallaby, brown antechinus, skinks and snakes. At twilight, the woodland canopy shifts and fills with sugar and feathertail gliders, the sky dotted with darting microbats feeding on flying insects.

And on the ground, bandicoots are everywhere, plucking berries and digging conical holes in search of insect larvae and fungi.

Today, if I'm lucky, I could spot all these native animals roaming the 96 hectares of scrub behind the predator-proof fence of The Briar's Wildlife Sanctuary in Mount Martha. All but one.

The southern brown bandicoot (*Isodon obesulus*), a ground-dwelling marsupial, is now locally extinct on the Mornington Peninsula. It hasn't been recorded in the area for decades, a fact that is hard for local biologist Hans Brunner to accept.

When bandicoots were plentiful

At 92 years old, Brunner, a tireless advocate for the species, remembers times when bandicoots were abundant up and down the peninsula.

In terms of local history, the bandicoot is only recently extinct. In 2007, Brunner, an expert in mammalian hair analysis, recorded the last hair sample of a southern brown bandicoot at The Pines Flora and Fauna Reserve in Frankston.

"The Mornington Peninsula should have been called 'The Bandicoot Peninsula'," he told me.

"There used to be so many bandicoots around."

The Pines reserve provided the perfect habitat for the vulnerable bandicoot, but urbanisation brought with it cats, foxes and dogs: the main culprits behind the species' demise.

In 2014, ecologist David Wilson surveyed the area. He reported, "It is reasonable to conclude that the SBB population in The Pines FFR has either gone extinct or supports very few individuals."

He told me he blamed the high number of foxes and cats and development in the area, and thought, "There should be an attempt to control foxes and

cats so the bandicoots can thrive. I would like to see more done."

Local ecologist Malcolm Legg conducted a recent survey in Red Hill and found no bandicoots there. His past research revealed bandicoots lost in Greens Bush, Arthurs Seat, Crib Point and Hastings. He confirmed southern brown bandicoots were no longer present anywhere on the Mornington Peninsula.

Why bandicoots are vulnerable

Deakin University PhD candidate and chair of the advisory Southern Brown Bandicoot Regional Recovery Group, Sarah Maclagan, explained the vulnerable nature of bandicoots. "They live in a nest, which is just like a ball of vegetation underneath dense grass or shrubs, just on the ground."

Maclagan thinks the loss of southern brown bandicoots on the Mornington Peninsula was due to several reasons including cats, foxes and potentially dogs as predators, as well as 'toxoplasmosis'.

Cats have a double impact on bandicoots by spreading the *Toxoplasma gondii* parasite in their droppings. A foraging bandicoot that ingests the parasite will usually die



Map of the Mornington Peninsula. Image: By Nick carson at English Wikipedia, CC BY 3.0.

Illustration of southern brown bandicoots from *The mammals of Australia*, London, printed by Taylor and Francis, pub. by the author, 1863. biodiversitylibrary.org/page/49738095. Image: Public Domain via Flickr. Background vignette edit by Deirdre Lynch, Screamer Media.

within weeks of infection through blindness or neurological symptoms that inhibit their innate fear of predators.

Another significant factor is the lack of connectivity of habitat.

Maclagan said, “Bandicoots rely on connected corridors of dense vegetation to naturally move around the landscape when there are local disturbances such as fire or poor weather conditions.”

They tend to live in ‘meta-populations’ where the juveniles disperse to find new areas to colonise, thus reproducing with genetically unrelated individuals. When habitat is fragmented, bandicoots have to travel across roads and through farmland abundant with cats and foxes; they don’t survive these dispersals without habitat connectivity.

“There is the need for a clear and comprehensive plan that’s got all the parties that need to be involved behind it,” Maclagan said. “There is a problem with low genetic diversity, and we are going to need to start looking at where we can have translocation sites and how we are going to keep the bandicoots in the landscape going forward.

“As much as I love and want habitat corridors, I think we definitely need to have these insurance populations as well.”

Politics dithers decisions

The conservation of habitat and the eradication of foxes and cats is an ongoing political issue that is not about to be solved any time soon. While the bureaucrats argue about who is responsible, we are rapidly losing species to regional extinctions.

Scientists are keenly aware of the need to focus funding towards programs that will provide the best ‘value’ for securing the species.

Maclagan said, “There is a big debate about whether you are better off keeping corridors in the landscape or whether you are better off investing in a few bigger reserves and doing translocations. Because bandicoots have proven themselves to be so adaptable, I would love to think that we humans can accommodate them and have corridors along our roadsides and in our backyards.

“But I am also starting to question whether my hopes are a little unrealistic. There will come a time when it is just too difficult to keep enough connectivity in the landscape for the bandicoots to move around, and we will have to rely on active translocations. We are on the cusp of that time now.”

Dr Terry Coates, a resident ecologist at the Royal Botanic Gardens in Cranbourne, agreed. He oversees and monitors a population of southern brown bandicoots behind a predator-proof fence at the gardens.

“Generally the trajectory is downwards for these guys,” Coates said. But he remains hopeful that there are management measures we can take.

“You can put up a predator-proof fence, or manage foxes, and you tend to get a good outcome,” he said. “They do respond to sensible management interventions.”

Dr Coates recently spoke to staff at The Briars and said re-introducing southern brown bandicoots into the reserve was something they were still interested in.

“The current view is that if the bandicoot is lost from these places, it’s pretty hard to get them back in there.”

Mornington Peninsula left out

The current *Sub-regional Species Strategy for Southern Brown Bandicoot 2014* does not include the southern Mornington Peninsula. Still, it says the list of proposed management areas “is not exhaustive and it is expected that other areas of suitable habitat will be revealed during the various activities funded under this strategy”.

The Briars Wildlife Sanctuary in the middle of the Mornington Peninsula presents such an area. It is already predator-proofed, and so is cost-effective, and has suitable habitat with great potential to sustain a colony.

The Briars’ habitat would benefit from the presence of bandicoots too. The active diggings of bandicoots help soil aeration and water retention, plus assist with leaf litter decomposition and seed germination.

Briars manager, Rebecca Levy and conservation team leader, Jonathon Ricciardello, said the southern brown bandicoot was a species they were considering as part of their ‘Ark Program’, along with the eastern bettong and long-nosed potoroo. They said ground-dwelling marsupials act as “ecosystem engineers through their role in spreading beneficial mycorrhizal fungi across the site”.

Levy and Ricciardello hypothesised, “The reintroduction of these species into the site will go some way in restoring ecosystem function and create a more robust and resilient ecosystem in the face of climate change.”

Maclagan also credited the bandicoot for the job it does in spreading around the spores of ‘truffle-like’ fungus.

“Some Australian plants require a very specific type of fungus ... the plants assimilate nutrients, and in return, the fungi benefit by gaining sugars,” Maclagan said. “Bandicoots eat the underground fungi, and then move around and poo out the spores ... they are really important for the dispersal of the fungi.”

Maclagan and others speculate that in areas where bandicoots exist there is a much higher diversity of mycorrhizal fungi. There is scope for research into the diversity of mycorrhizal fungi at The Briars.

Soil analysis could take place before and after the reintroduction of bandicoots into the area. Bandicoots also provide natural fire retardation—an activity that deserves special recognition in a warming climate. Their conical diggings help to retain water and turn the forest floor keeping it decaying and moist.

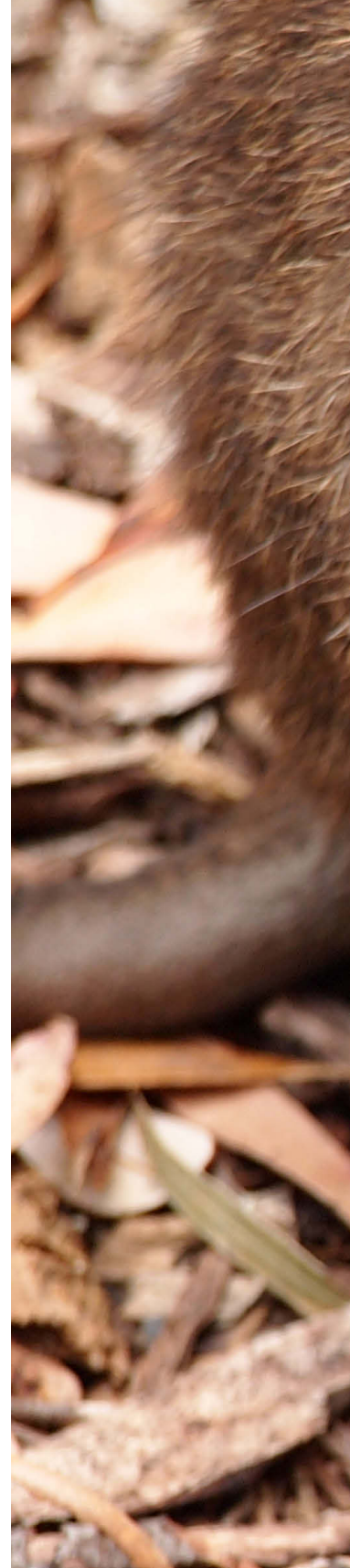
The benefits of bandicoots are big.



I meander down the other side of the ridge to The Briars wetlands. Welcome swallows duck and dive in the sky.

I pass a billabong with pobblebonk frogs in a full chorus of love-song. I take a moment to imagine that one day we will again be surrounded by the ‘teenagers’ of the Australian marsupials.

Ecologists, conservationists and locals would be delighted to welcome the southern brown bandicoot back to its ancient homeland of the Mornington Peninsula. ■



▲ Southern brown bandicoot (*Isodon obesulus*). Photo: © Paula McManus. www.flickr.com/people/paulamcmanus/



REFERENCES

Agriculture Victoria. 2019. *Integrated fox control for urban and semi-urban areas*. Retrieved from <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/invasive-animal-management/established-invasive-animals/integrated-fox-control-for-urban-and-semi-urban-areas>

Department of Environment and Primary Industries. 2014. *Sub-regional species strategy for the Southern Brown Bandicoot*. Retrieved from <https://www.msa.vic.gov.au/introduction>

Hillman. A., Lymbery. A., Thompson. A. (2015).

Is *Toxoplasma gondii* a threat to the conservation of free-ranging Australian marsupial populations? *International Journal for Parasitology: Parasites and Wildlife*. 5(1), 17–27.

Retrieved from <https://www.sciencedirect.com/science/article/pii/S2213224415300274>

Victorian Planning Authority (n.d.). *Key facts on Melbourne's urban growth boundary* (UGB). Retrieved from <https://vpa.vic.gov.au/greenfield/more-information/urban-growth-boundary-key-facts/>

Wildlife Australia Magazine. (2019). About us. Retrieved from <https://www.wildlife-australia.org>

Wilson, D. (2014). *Southern Brown Bandicoot Monitoring at The Pines Flora and Fauna Reserve Spring / Summer 2013 / 14*. Retrieved from https://www.academia.edu/9633597/Southern_Brown_Bandicoot_monitoring_at_The_Pines_Flora_and_Fauna_Reserve_-_spring_summer_2013_14 ■

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