

NEWSLETTER – Feb 2021 – Extracts from the On-line Version

Rabbit-Free AGM & Committee news

The 2020 Annual General Meeting ended up as a Zoom video-conference – at the last minute due to changing Covid-19 restrictions. While we missed the chance to catch-up over a cuppa it was none-the-less nice to see everyone on-line, to hear Alister Haigh's fascinating Easter Bilby story, and to complete the business of the day – including tabling the Annual Report.

The Committee for 2021 is Deane Crabb, Graeme Finlayson, Amy Iannella, Carolyn Ireland, Bruce Munday, and Greg Mutze, with Wayne Meyer, William Morgan and Peter Day continuing as Chair, Treasurer/Public Officer and Secretary/Executive Officer respectively.

An early task for the Committee is the development of a Business Plan. A draft will be available for their March meeting. As a prelude to the Plan, the Committee has committed to trial a membership management program aiming to make it easier for members to interact with the Foundation and, ultimately, with other members. There will be more on that in the next Newsletter.

Kaye Kessing's Rabbits

Foundation member and co-author of the 'Easter Bilby' book, Kaye Kessing, has a rabbit story different from those who remained on the land, or scientists involved in their control. She grew up with rabbits on a mixed farm in mid-north South Australia, then later helped hunt them with Aboriginal women in the far north west of South Australia.

Kaye transferred a deep love for the land into an abiding concern for the species those lands had lost, and indeed are still losing. Her rabbit involvement ended up in creative education, providing unique and instantly recognisable environmental materials and projects for teachers and other educators to use. Kaye's story is **appended**.

Possible evolution of Covid-19

Covid-19 has everyone talking about viruses, their transmission, and the development of new strains. This is familiar territory for many rabbit researchers. Foundation patron, Dr Brian Cooke, has been at the forefront in developing bio-controls for European wild rabbits in Australia.

In an opinion piece Brian reflects on the differing effect viruses have on the young, drawing on examples from Covid-19, myxomatosis and RHDV, and what that might mean for the evolution of Covid-19. **Brian's insights are appended**. As an aside, another of Brian's observations is that the Australian policy of seeking to contain and limit the spread of Covid-19 also helps minimise the risk of a new virus variant emerging here.

Everyone loves La Nina

A report about warren mapping as part of a rabbit control program on Bon Bon station by Bush Heritage Australia led to a story on ABC News, including an interview with Foundation Committee member, Dr Carolyn Ireland. The Centre for Invasive Species Solutions (CISS) also spoke of the surge in rabbit numbers being seen in many parts of Australia, linked in part to La Nina rainfall.

The surge in rabbit numbers is also a strong reminder that complacency in rabbit-control, and over-reliance on bio-controls, results in small remnant populations surviving hard times and becoming a nucleus for rapid growth once conditions improve.

Rabbits still in town

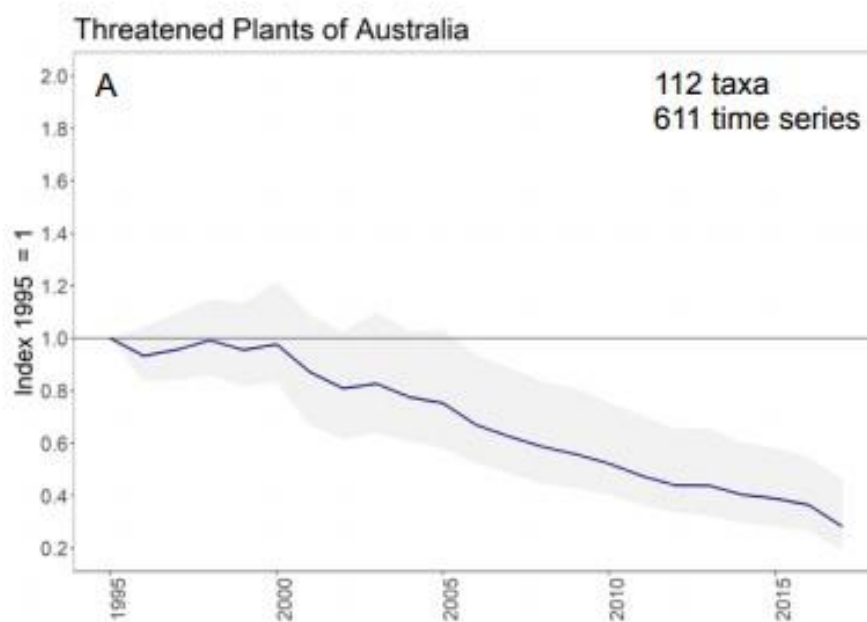
In 2019 Foundation Committee member Dr Bruce Munday wrote a Newsletter article, '*Rabbits come to town*', about the efforts of a small peri-urban community to deal with rabbits. The close proximity of houses, and the range of views about rabbits and various control options in the community, often result in control programs being contentious and difficult in peri-urban areas.

In an update article, Bruce reflects on how the community has come to a shared view and on the lessons learnt from their first attempts at control – including the importance of eliminating 'that last breeding pair'. **The update, '*Rabbits still in town*', is appended.**

Staggering loss of threatened plants

Recent research has revealed the staggering rate at which Australia is losing threatened plant species – with populations falling, on average, by almost three quarters between 1995 and 2017. Rabbits are one of the threats to native plants, and have been reported as a threat to 260 threatened plant species.

Of-course it is not just native plants that are directly affected by rabbits and other threats. The repercussions spread through entire ecosystems and landscapes. More information on the loss of threatened plants and what is needed to rectify the problem is **appended**.



Kaye Kessing's *RABBITS*



Back in the 50s and early 60s rabbits were prolific on our farm and took up a reasonable part of Dad's time. Like many country kids, by about six or seven, my brothers and I could usually hit a rabbit with the old .22, set one of the old style steel traps, kill by a quick head blow against a rock and as we strengthened with a quick sharp neck stretch. We lived in a world of killing, skinning and gutting and thought little of it. Mum, a city girl, who might now be termed a 'greeny' soon learnt it was pointless to push such views onto a young farmer struggling to improve a degraded property. I do not remember cruelty - in our family or others - we accepted that animals had to be killed and it was done as quickly and humanely as possible. Sixty- plus years on, with the old steel traps gone, lamb's tails no longer cut off and the continuing war on mulesing, farm animals must still be killed for others to eat and

rabbits controlled. As an environmental educator, I have focused on the killing of native creatures: directly by cats and foxes and indirectly by rabbits; choosing a comical 'cartoon realism' style to spread the 'death message' - hopefully in an appealing and respectful way.

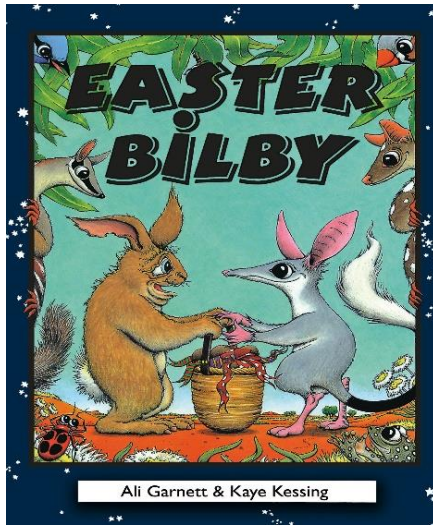
In 1972 I took a job as the first art/craft teacher in the Pitjantjatjara Lands - at Amata School in the far north west of South Australia and back in the world of rabbits. On most weekends the back of my old Valiant ute would be crammed with women, children, the odd dog plus blankets, billies, small crowbars and shovels. My job was to provide jerry cans of water and transport. I'd be directed towards fruits or seeds in season or to witchetty grubs, goannas or rabbits. Warrens could be huge: a maze of shallow tunnels twisting and turning beneath the soft orange-red sand. I'd watch the experts follow the fleeing rabbits along tunnels with thin sticks, wires or a sense of smell, digging into the tunnels when needed. Most rabbits ended up in dead ends, to be killed quickly then taken back for family. Some would be thrown onto coals to singe the fur off then lightly roasted beneath them. Having come from a family that loved its fatty mutton browned to a crisp, I never partook in much of the bloody, juice-filled, bush-cooked rabbit.

Rabbits were by then well established through the "Pit Lands" and long appreciated as a reliable food source by the locals. I was vaguely aware that there should be other small to medium sized animals about and, with friends, did spot bilbies near Ernabella once - apparently the last known group to disappear in that country. For a year-plus I lived, hunted and gathered with women who had grown up on bush tucker and had witnessed the spread and repercussions of cats, rabbits and foxes across the lands.

After a year of overseas travel I returned to complete my teaching bond to South Australia and met Bob Kessing, a commercial designer. We set up a sign writing and screen printing business in Alice Springs. It was not long before I was designing and printing t-shirts depicting witchetty grubs, bilbies, sturt desert peas and desert roses; promoting the native species I was learning about and few others knew of.

In 1989 I spent the year researching, drawing then painting the history and impact of the spread of introduced animals across the arid lands. "**Battle For The Spinifex**" became an exhibition of eleven large (1.5 metre) square canvases as backdrops.

In 1992 I painted the five-metre canvas backdrop for “**Spinifex Skeletons And Sewers**”, depicting Australia from the red deserts, through pastoral and agricultural lands to the big city. In front of it a friend and I performed the story of an unlikely friendship between a bilby and cat, with the inevitable consequences. Assisted by a rabbit, a hopping mouse and a night parrot puppet we toured it from Alice Springs to the Adelaide Festival.

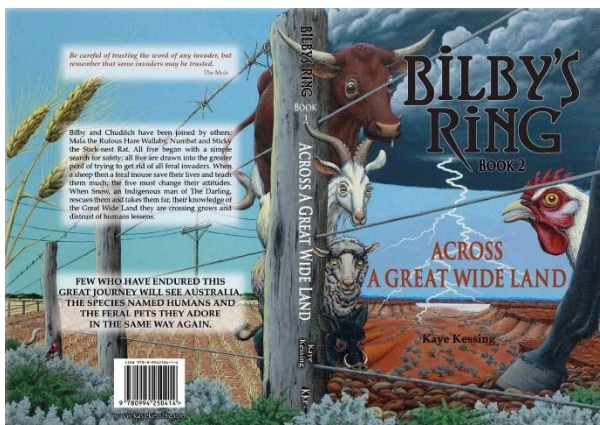


In 1994 I was approached by the then Anti-Rabbit Foundation to find a native animal to replace the introduced Easter Bunny. A grey, burrowing Bilby was the obvious choice and **The EASTER BILBY Picture Book** was born, telling how a humble bush bilby got the job of delivering Easter eggs around Australia from tired old Easter Bunny. Haigh’s Chocolates came on board, producing chocolate bilbies and for many years my alter ego ‘Gran’ read the story to families in Adelaide at Easter.

The EASTER BILBY’S SECRET Picture Book in 1998 told how Easter Bilby worked out how to get the Easter eggs around Australia without getting eaten by Cat or Fox.

In 2009 I began the research for a project I’d been imagining for years: to present the environmental situation across Australia - from desert, to pastoral, to agricultural with river ways and conservation areas, into “The Biggest City by the Endless Sea”. Following my illustrative style I presented the saga as fantasy: writing Bilby and four other endangered friends across Australia through its major ecosystems and habitat types.

In the ‘Great Deserts of the West’, Bilby and his mother follow the rains and in turn are followed by rabbits, who take over their burrows, eat up their food and so force them on. When Bilby’s mother is eaten by a fox, Chuditch the Western Quoll, a most unlikely companion, talks him into travelling together, “to find a place safe from feral invaders”. Joined by Mala, Numbat and Sticky the Stick-nest Rat - all directly or indirectly affected by the spread of rabbits - they journey through many new habitat types, meet other native creatures in trouble and learn about new threats far across Australia, including the potential of climate change.



In 2015 **The BILBY’S RING Trilogy** was launched by Ted Egan AO in Alice Springs, with a mini festival and great thanks to The Arid Lands Environment Centre (ALEC) plus local scientists.

Rabbits have followed me from the family farm to Aboriginal lands and then through a working lifetime of projects: many perhaps rather bizarre but all, hopefully each in their own way, continuing to help spread the word about our increasingly fragile Australian environments.

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Experiences with rabbit biocontrol provide insights into possible evolution of Covid-19

One interesting aspect of the new coronavirus disease (Covid-19) is that the causal virus (SARS-Cov2) rarely affects children. And even if infected, kids rarely show acute symptoms like those seen in elderly patients.

This is often passed off by saying that children have much better immune systems than older immuno-compromised adults. While this is true, there are also ‘childhood diseases’ such as measles and chicken pox which, before vaccines were developed, predominantly affect school-age children – so is the picture really that simple?

Interestingly, rabbit haemorrhagic disease virus (RHDV), introduced into Australia 25 years ago to control pest rabbits, also spread poorly among young rabbits and caused no overt disease, but once rabbits became 12-week-old ‘sub-adults’, they became highly susceptible and up to 95% died if infected. By contrast, the myxoma virus, another pathogen released to control rabbits, generally caused heavier mortality among rabbit kittens than adults.

It seems from such observations that there must be two-way interaction between viruses and hosts’ immune systems. Age-related outcomes might be partly determined by the virus, not just the host. If this is the case, how could a simple virus ‘choose’ to infect hosts of a certain age? Moreover, how could such a system have evolved?

Although some scientists think that RHDV ‘jumped’ into rabbits from another species, it is generally considered that it evolved from closely related non-pathogenic caliciviruses which still circulate harmlessly in wild and domestic rabbits. These viruses are passed from rabbit to rabbit by social contact (Capucci et al 1996). However, the rabbit’s social world differs from ours, especially during the rabbit’s breeding season. When breeding, wild rabbits form tight social groups, often 2 – 3 adult females and 1 – 2 males and they defend a territory around their home warren, fighting and chasing off other rabbits which try to intrude. Young rabbits have little social contact with rabbits outside their group because they do not stray from the warren. On the other hand, adult male rabbits make forays to the edge of their territory, not only to chase away other rabbits but also to reinforce their territorial boundaries using scent from their chin glands or to deposit strongly scented droppings on dung-hills or ‘buck-heaps’ to claim ownership. Chin gland secretions of dominant male rabbits are not only used to cover scent marks of other visiting males but also applied to female rabbits and young to maintain a group smell and enhance recognition of group members (Mykytowycz 1969).

It is not hard to see the advantage for a virus if it affected sub-adult or adult rabbits under those circumstances. It could spread from one rabbit territory to another much more readily. That would be especially so when sub-adult rabbits left their home warren and tried to attach themselves to a new social group (Jennings and Mutze 2017). By contrast, a virus which affected mainly young rabbit kittens would be confined within a social group and its chances of spread and persistence would be reduced.

It is harder to see how a simple virus could preferentially infect an adult rabbit rather than a young one. Nonetheless, there are possible mechanisms. We know, for instance, that cortico-steroids produced by the adrenal glands change during growth and development of the young rabbit and that adrenal glands take on their final adult shape only when rabbits reach 12-weeks of age.

Thus, it is conceivable that those non-pathogenic caliciviruses which most readily infect rabbits with 'mature' adrenals and the right mix of cortico-steroid hormones might have had a selective advantage because they spread more easily between rabbit territories. Sex hormones can be excluded in this case because non-pathogenic caliciviruses infect both sexes equally.

Although a non-pathogenic precursor of RHDV may have been adapted to spread between rabbits in this way, things changed when highly virulent RHDV emerged. Instead of rabbit to rabbit spread alone, it could suddenly be transmitted by insects such as carrion flies that feed on dead rabbits (Asgari et al 1998) then leave 'fly-spots' containing viable virus on pasture vegetation subsequently eaten by rabbits.

Under those circumstances it may not have been so important for the virus to infect mostly adult rabbits and indeed, there is evidence from the field that as the years progressed an increasing number of young rabbits that died from RHD were found (Mutze et al). It may also be relevant that RHDV2, a new virus variant that is displacing RHDV, spreads with greater facility among young rabbits (Dalton et al).

These details can be summarized by saying that when RHDV first emerged, it still retained some of the characteristics of its non-pathogenic ancestor, but since that time, with evolutionary changes, viruses are losing some of those characteristics as they evolve.

Perhaps this also says something about Covid-19. If it has recently emerged from a wildlife reservoir or from a related virus of low pathogenicity, we might expect it to retain some of the characteristics of the antecedent virus, such as a low rate of infection among juveniles. Nonetheless, these characteristics could diminish over time if they do not help the virus to spread efficiently among humans.

We should be on the lookout for the possibility that as Covid-19 evolves, it may behave differently and begin to infect a wider cross-section of the population including younger age groups.

Dr. Brian Cooke.

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Rabbits still in town

Back in November 2019 I wrote for the RFA Newsletter a short account ([Rabbits Come to Town](#)) of efforts to eliminate, or at the very least control, the rabbit population at the Aldinga Arts/Eco Village. To that point we had used RHDV-K5 with carrots, ferrets, shooting (with air rifles), and warren fumigation with varying degrees of success. Of course the issue was not how many rabbits we had killed, but how many were left—there were still plenty.

To give this some context, the residential part of the village is about 17 hectares of which half is common land—orchards, open space, and abundant thick vegetation. The northern boundary is unfenced from government land including Willunga Creek.

To deal with the remaining rabbits the village agreed to Pindone poisoning. We had hoped to avoid this option, but most villagers accepted that there was no realistic alternative. A few expressed unease and a very few were against it, mainly on account of the potential for off-target casualties, but also the ‘apparent’ suffering of the targeted victim. There are no off-leash dogs or cats in the village and baited areas were clearly marked and managed in terms of cleaning up residual bait.

An initial spotlight count on 7 February 2020 recorded 32 rabbits. We chose oats rather than carrots as it was too difficult to store the latter. Borrowing the Landscape Board’s baitlayer we did three free feeds followed by a further three with Pindone, all at three-day intervals. Sites inaccessible to the baitlayer we did by hand. On 9 March we counted only 3 rabbits in the spotlight and had buried 27. The problem was of course ‘those three’ and all the others that we could not see.

We continued hand baiting targeted sites—sites where rabbits had scratched and were evidently feeding. By the end of April we had buried 44 and were hand baiting only 4 sites, but those last few were persistent, then with the break in the season they lost interest in oats.

The rest of the story is predictable. A spotlight count on 19 October revealed 11 rabbits then on 29 January 2021 we spotted 16 (somewhat less than I expected).

What have we learned from this? Firstly, for a built-up area shooting at night (when children are not about) is pointless. Fumigating warrens with vehicle exhaust is fruitful, but only for what is probably a small population that actually live underground. K5 and Pindone are effective, but the extent of calici immunity in the remnant population remains to be seen; there is still unease about Pindone, even the mild critics commenting on a perceived increase in dead birds.

The most important lesson for the village is the extent and rapidity of population recovery from a handful to many, and hence the importance of eliminating that last breeding pair. Seeing is believing and this will be our focus in 2021.

The other wild card is the unprotected northern boundary where rabbits can enter from Willunga Creek and surrounds. Spotlighting and on-ground inspection show little evidence of rabbits there, perhaps due to a significant fox presence. The Landscape Board strongly promotes a community response to the rabbit problem, but it is unclear whether this applies when Government is the neighbour. We have not closed our minds to the need for a rabbit-proof fence, taking us all the way back to the 1890s!

Dr Bruce Munday

Staggering loss of threatened plants

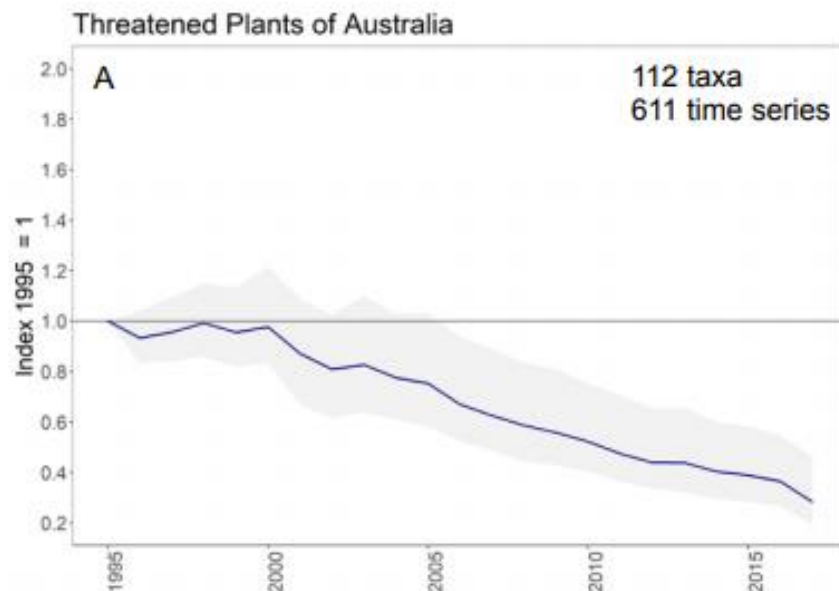
Recent research out of University of Queensland, Sydney University and Charles Darwin University has revealed the staggering rate at which Australia is losing threatened plant species. As the study authors point out, it is generally animals that capture the spotlight when talking about threatened species. But while plants are important in their own right, they also provide food and act as habitat for other species along with their critical role in the broader ecosystem.

Rabbits are a threat to 260 threatened plant species in Australia, as recorded in the [Threat Abatement Plan for rabbits](#). The subsequent 'bottom-up' impact of rabbits on entire ecosystems is discussed in Rabbit-Free Australia's '[managing invasive species](#)' post.

Using data from Australia's [Threatened Species Index](#) the research showed that the population sizes of our threatened plants fell by almost three-quarters, on average, between 1995 and 2017. Land clearing, changed fire regimes, grazing by livestock and feral animals (such as rabbits), plant diseases, weeds and climate change are common causes of decline.

The researchers state that Australia must urgently change the way we prioritise conservation actions and enact environment laws if we hope to prevent more plant extinctions. Critical actions include stopping further habitat loss and more funding for recovery actions as well as extinction risk assessments.

Finally, they call for more funding for research into the impacts of key threats (and how to manage them) that will help ensure our unique flora are not lost forever. We might add that there needs to be more investment in regional control coordinators to get what we already know better and more widely applied in programs across neighbouring properties.



Threatened plant index - the change in plant abundance relative to 1995.

Source: [Factsheet](#) - Threatened Species Recovery Hub.