



## Foundation for Rabbit-Free Australia

Newsletter Volume 34, September 2021

Abridged hard copy version.

### AGM

The Foundation's Annual General Meeting will be held at 2:00 pm on Thursday, November 11th, at the Santos Conservation Centre (Adelaide Zoo). Meeting details, an Invitation and Agenda are **attached**. Hopefully we will be able to meet in person this year, to enjoy a chat and a cuppa, rather than a hastily arranged on-line video conference in response to a Covid-19 lock-down as happened last year.

Our guest speaker will be Dr Katherine Moseby, a renowned arid zone ecologist focusing on threatened mammals and feral predators, with an interest in rabbits. Katherine is associated with the University of New South Wales and with Arid Recovery, and is currently undertaking a project with some assistance from the Foundation.

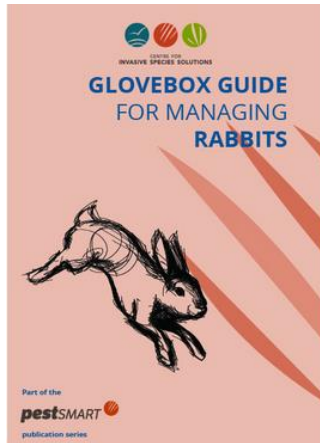
The AGM also provides an opportunity for new faces to join the Committee. If you would like to nominate a Rabbit-Free Australia member to join the Committee please notify the Executive Officer and submit it by Oct 27th.

If you would like to attend the AGM, please [RSVP](#) by Oct 27th. Registered attendees will be provided with a full set of agenda papers prior to the meeting.

### Mastermind

We've been informed that a recent question on TV quiz show Mastermind was, "What animal does Foundation for Rabbit-Free Australia want to replace the rabbit with?"

Happily, the contestant knew the correct answer!!



## Glovebox Guides

As Associate Members of the [Centre for Invasive Species Solutions](#) we have been discussing with CISS the importance of integrated pest control; dealing with associated species with a strategic combination of biological and physical controls, applied across districts.

Those conversations have resulted in the Foundation and CISS collaborating to develop a section on integrated pest management for the 'Glovebox Guide for managing Rabbits'. It may be a precursor to equivalent sections in other pest control Guides available through [pestSMART](#). The project will be completed later this year.

## Easter Bilby

A new Easter Bilby fact sheet is available telling the story of why the bilby is our mascot, how bilbies got their name, and much more. It is a great read and is **attached** for information.

## Rabbit-Free Phillip Island

Many people know of Phillip Island as the home of roaring motorcycles and parading little penguins, but it also supports rabbits - too many of them.

Social and environmental circumstances on the Island make it difficult to control rabbits, so the local community has come up with some innovative methods to engage people and protect houses and important coastal environments from rabbits.

Their story is **attached** for information.





## Learning on the job - RHDV-K5

Nature Foundation manages seven nature reserves totalling over 5,000 sq kms (0.5 million ha). Rabbits are a threat to their conservation goals and a challenge to manage in vast landscapes.

This year they are trialling the use of RHDV-K5 as a biocide to knock down rabbit numbers at their Hiltaba Reserve.

For information on the size of the task and how Nature Foundation (who are members of Rabbit-Free Australia) are trialling RHDV-K5, please see the attached story.

## Kids Corner

Family memberships are now available including children (or even grandchildren), so we are looking to add some occasional features just for them.

As a start, Kaye Kessing (co-author of Easter Bilby and associated books) has provided an extract from the 'Easter Bilby Action Pack' for us to share with young children. Also included is some information for older children that might be useful in a school project.

The **Witchetty Grub challenge** is attached.

## Latest Blog - Dingoes alone don't control rabbits

Following on from his insightful comments about the possible emergence of Covid-19 variants in an earlier Blog, Foundation Patron Dr. Brian Cooke has provided another commentary Blog.

This time it is about dingoes and their interaction with rabbits. Please see the **attached** Blog.



## **Latest News**

Recent News items from our website included the following:

- 1,2,3 for rabbit control. Bait, rip, fumigate and Plan, do, review - advice from VRAN and CISS.
- Wildlife recovery rides on pest control. Locally extinct wildlife is being reintroduced to feral free reserves in NSW.
- Rebounding rangelands. Wildlife recovery across southern rangelands is attributed in-part to the success of RHDV.
- Integrated solutions. A Riverland example of working across boundaries, targeting feral predators and rabbits with biological and physical controls.

## **Feedback**

Any thoughts on this Newsletter, technical difficulties with links, things you'd like to see in future editions, or any matters to do with the Foundation - please let us know.

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#BilbiesNotBunnies







## Notice of Annual General Meeting

### To be held at

The Santos Conservation Centre (opposite the entrance to the Zoo),  
Adelaide Zoo, Plane Tree Drive.

### on

THURSDAY, 11 November, 2021 at 2:00 pm.

### Guest Speaker

Dr Katherine Moseby (Arid Recovery & UNSW)  
'20 years of rabbit eradication and restoration.'

All members and guests are welcome, but **booking is essential**.  
Exact numbers are required for COVID-19 planning and catering purposes.

### Please RSVP by October 27

Register to attend and advise of any dietary requirements to  
[admin@rabbitfreeaustralia.org.au](mailto:admin@rabbitfreeaustralia.org.au) or 0417 518 266

Meeting Papers will be provided, prior to the meeting,  
to all members registered to attend.



Santos Centre: on the left before entering the Zoo from Plane Tree Drive, in the Botanic Gardens.

## Annual General Meeting Agenda

The Santos Conservation Centre (opposite the entrance to the Adelaide Zoo),  
Plane Tree Drive, Botanic Gardens.  
Thursday, 11 November, 2021 at 2.00pm

1. Welcome and apologies
2. Confirmation of Minutes of previous AGM
3. Reports:
  - a) Chairman's Report & Launch of Prospectus
  - b) Treasurer's Report
  - c) Auditor's Report & Appointment of Auditor
4. Elections:
  - a) Election of the Committee
  - b) Election of Office Bearers
5. Guest Speaker – Dr Katherine Moseby
6. Any Other Business
7. Meeting Close

## Easter Bilby Fact Sheet

### Bilbies

The greater bilby (*Macrotis lagotis*) is a small (rabbit sized) marsupial from Australia's bandicoot family. It has a pointed snout, long pinkish ears, a long black tail with a white tip, and strong forelimbs and claws for burrowing and digging up food. Males are much larger than the females and can be up to 2.5 kg in weight. Each bilby moves between up to 12 to 18 burrows in their home range in response to food availability.



Greater Bilby. Image: ANCA (1995)

Bilbies are strictly nocturnal, foraging at night and spending the day sheltered in their burrows. The burrows may be three metres long and spiral down about two metres. Bilbies have very good senses of smell and hearing, and retreat to their burrows if alarmed.

They feed on insects (e.g. termites, ants, grasshoppers and beetles), butterfly and moth larvae (e.g. witchetty grubs), spiders, seeds (which are licked up by their long, slender tongues), fruit, bulbs and fungi. Areas where bilbies are active may be pock-marked with shallow holes, generally up to 10 to 25 centimetres deep, where they have been digging for food.

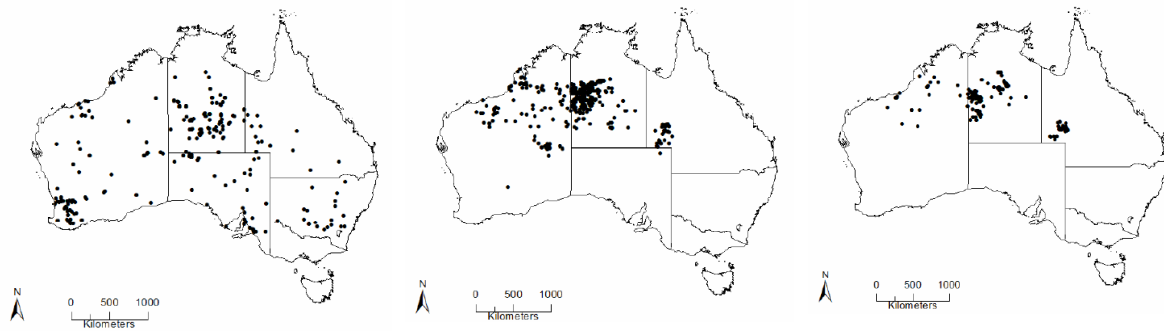
Bilbies usually live on their own, but sometimes form pairs or small groups including the young. They breed whenever conditions are favourable and the young are carried in a pouch after birth. Females can have up to four litters a year in ideal conditions, usually with one to three young each litter. In captivity bilbies live for up to seven years, but their lifespan is probably less in the wild.

Bilbies were important in Aboriginal culture and were known by different names in different traditional lands. The name Bilby is derived from the Ullaroi language name – Bilba. Other European names include the rabbit-eared bandicoot and pinkies (originally pincoos, which appears to be derived from pingku, the traditional Kurna word for bilby). Pinky Flat near the Adelaide Oval in South Australia was named in reference to their former abundance adjacent to the River Torrens.

## Conservation status

Bilbies are listed as vulnerable by the national Environment Protection and Biodiversity Conservation Act. Once common throughout large parts of Australia they are now only found, often in small, isolated populations, in mulga shrublands and spinifex grasslands in Western Australia and the Northern Territory, and the Mitchell grasslands of south-west Queensland. They are presumed extinct in New South Wales. A [National Recovery Plan](#) for the Greater Bilby was produced in 2006.

Maps of bilby distribution showing the decline over time.



All historic records up to 1970

Records 1971 - 1990

Records 1991 - 2004

Recorded observations from the national greater bilby database (Pavey, 2006)

NB: Bilbies are now most likely to be found in lands north of the main rabbit zone.

Their demise was a result of many factors. In the late 1800s they were hunted for their skins and were 'by-catch' in rabbit traps. They were pushed out by the development of towns, farms and grazing lands, where domestic stock compete for feed. They are still preyed upon by feral cats and foxes, and they are outcompeted by rabbits.

European wild rabbits reduce the cover provided by native vegetation, prevent the natural regeneration of many plant species, and compete with bilbies for food and burrows. Bilbies are ejected from their burrows by rabbits. Wild rabbits are also food for feral cats and foxes, sustaining the populations of predators and hence maintaining increased predation on bilbies.

An authoritative view from 1925 was that in areas with little predation the bilbies downfall was probably due to 'the extraordinary abundance of rabbits, and the consequent struggle for breeding burrows'. Anecdotal evidence from 1903 linked an increase in locusts with the demise of bilbies (referred to as pincoos), which was attributed to the destructive characteristics of rabbits which when burrowing 'killed every living thing found ... including the very useful pincoo'.

## Easter Bilby's message

Easter Bilby champions the cause of native plants and animals, reclaiming the Australian bush from European wild rabbits. The Easter Bilby's message is, 'it's us or them' – rabbits must be removed so the original inhabitants can survive. Bilbies want their burrows, their food, and their friends back.

The Easter Bilby campaign slogan, '**Bilbies not bunnies**', is for all the displaced and threatened plants and animals. It is a brave and bold effort that can only succeed with help from humans. Without our intervention to control rabbits the plight of bilbies, and other native species, will never improve.

Several educational resources are available telling the Easter Bilby story:

- Books like the 'Easter Bilby's Secret' and 'The BILBY'S RING', and the 'Battle for the Spinifex' poster pack are available through the [Kaye Kessing website](#).
- Haigh's Chocolates promote awareness of the Bilby's message through their [chocolate Easter Bilbies](#).



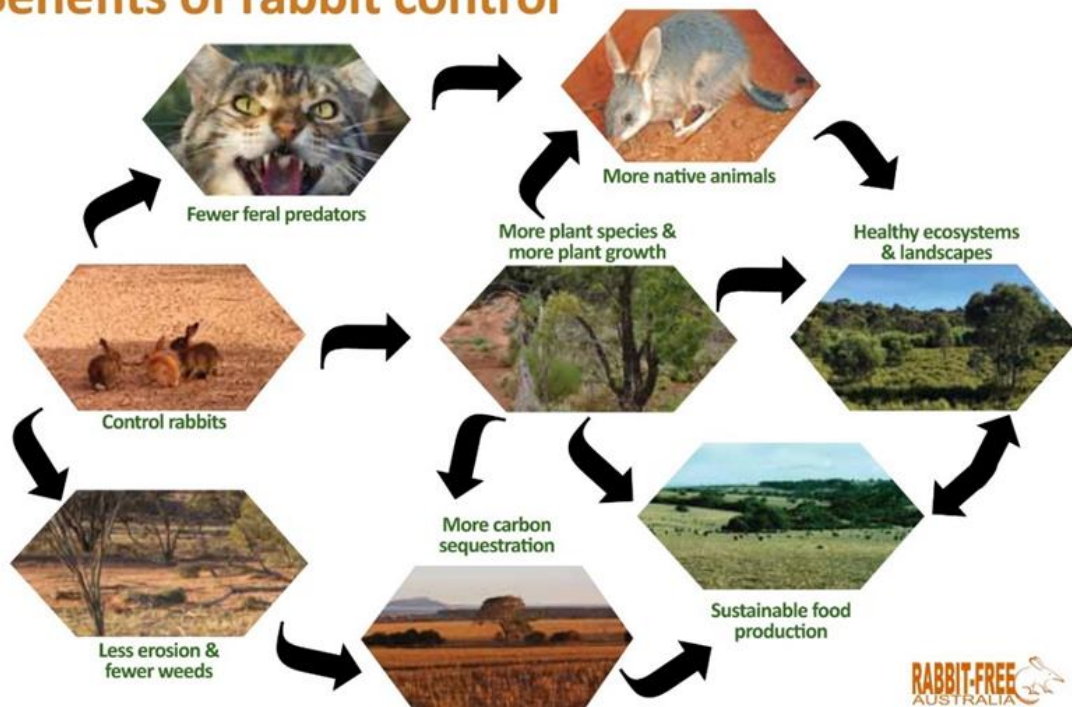
## The rabbit problem

The European wild rabbit is an introduced pest throughout the southern two thirds of Australia. They affect natural environments, primary production, and even townships and infrastructure. Their broad distribution, and the wide range of problems they cause, make them the nation's worst vertebrate pest. European wild rabbits adversely affect over 300 threatened native species, change landscapes, and cause losses of over \$200 million a year to agricultural production.

The benefits of rabbit control include:

- **More plant species and more plant growth.** Rabbits are selective feeders and, even in low numbers, can eliminate entire species of plants. In high numbers they can wreak havoc across entire landscapes.
- **Fewer feral predators.** Rabbits can be easy tucker for introduced predators like feral cats and foxes – helping to sustain those species and hence their predation on native animals.
- **Less erosion and fewer weeds.** The burrowing of rabbits and their destruction of vegetation can leave land bare and open to erosion, the degradation of waterways, and invasion by weeds. Rabbits can also undermine roads, water-tanks and even buildings.
- **More native animals.** More abundant and healthier bushland provides food, shelter and nesting options for a myriad of animals which, together with fewer feral predators, results in healthier populations of native animals ranging from invertebrates to reptiles, birds and mammals.
- **Sustainable food production.** Controlling rabbits results in more crop and pasture growth and production, less damage to infrastructure, and lower costs of production due to less need for pest and weed control.
- **More carbon sequestration.** More plant growth equates to more carbon sequestration.
- **Healthy ecosystems and landscapes.** All of the above improve the health of our Australian landscapes and natural ecosystems.

## Benefits of rabbit control



## References

- ANCA - Greater Bilby Recovery Team (1995) '*Bilby. Australia's threatened plants and animals.*' Australian Nature Conservation Agency. Canberra.
- Commonwealth of Australia (2019) 'Recovery Plan for the Greater Bilby – DRAFT'.
- Jones, Frederick Wood (1925) '*The Mammals of South Australia*'. British Science Guild (South Australian Branch) published by favour of the Honourable the Premier.
- Pavey, C. (2006). '*National Recovery Plan for the Greater Bilby Macrotis lagotis*'. Northern Territory Department of Natural Resources, Environment and the Arts.
- The Advertiser, Friday 1 February 1935, page 23, '*Disappearance of the bandicoot. Destroyer of grasshoppers*'.

Produced by Foundation for Rabbit-Free Australia Inc. 2021  
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For more information: [www.rabbitfreeaustralia.org.au](http://www.rabbitfreeaustralia.org.au)

Foundation for Rabbit-Free Australia is the registered holder of the Easter Bilby trade mark.



## Rabbit Free Phillip Island – A study of community based rabbit control.

‘Rabbits are the single most threatening process that we have the power to manage’ says Gidja Walker in an assessment of threats to coastal vegetation on the Surf Beach to Sunderland Bay coastal reserve of Phillip Island (Millowl), Victoria.

Phillip Island is a popular tourist and holiday destination, with many absentee landowners settling in over weekends and holiday periods. It is famous for motorcycle sports (international MotoGP championship), and for the little penguins that star in an evening ‘parade’. Foxes have been removed to protect the abundant birdlife, such as little penguins and migratory short tailed shearwaters along with introduced threatened species such as bandicoots. Feral cats are now being targeted for control.

Rabbits were introduced to the island in the late 1850’s. They have multiplied since then and although it is difficult to identify warrens and to estimate the number of rabbits due to the nature of the area, they are almost in plague proportions. Many rabbits (probably most) now live under houses and sheds near the coast from which they venture out to graze – free from fox predation. They cause several problems to natural areas, as well as to gardens, and are threatening to undermine buildings.

- The rabbits are voracious in their browsing, targeting species such as Trigger Plants (*Stylidium* sp.) and Running Postman (*Kennedia prostrata*), virtually to the point of elimination.
- Rabbits nutrify soil through their droppings and urine which encourages various weeds, particularly *Medicago* spp. and annual grasses such as *Vulpia* spp. - which is known to affect many indigenous species including native grasses and orchids.
- Rabbit digging also causes increased erosion, creating an additional pressure on the relatively erodible coast.



Hot pink flowering Grass Trigger Plants, Surf Beach Sunderland Bay coastal reserve, Phillip Island, 2009.  
Image: Gidja Walker.

If nothing is done to control rabbits some native plant species are likely to become locally extinct, weed control, restoration and revegetation efforts will be ineffective, and feral cats will be sustained by preying on rabbits.



## Rabbit Free Phillip Island – A study of community based rabbit control.

Rabbit Free Phillip Island is a local initiative to make sure that doesn't happen. It is driven by local volunteers in collaboration with several organisations and agencies. Their challenges are two-fold. First, the community as a whole has to appreciate often unseen damage caused by rabbits to the coastal vegetation and commit to doing something about it. Second, they need to devise innovative control techniques that can be safely applied in such a populous area.

Aiming to 'inspire, engage, educate and facilitate community action' the Surf Beach Sunderland Bay Coastcare Group planned a field day to examine rabbit impacts, discuss what could be done, and enjoy a shared lunch as an opportunity for full-time and part-time residents to get better acquainted. A sudden COVID-19 lock down meant the event quickly transformed into an online 'community conversation', which helped to lay the foundations for actions to follow.

A series of interlinked activities are planned or in the planning pipeline:

- rabbit proofing homes will be a 'first line of defence', offering advice and training (warren fumigation and rabbit proof fencing) to home owners, aiming to eliminate the major refuge enjoyed by rabbits.
- a rabbit proof fence is proposed for the nature reserve that abuts homes, ensuring rabbits from residential areas can't enter the reserve, while rabbit exclusion cages are used inside the fence to prevent rabbits from grazing sites with Grass Trigger plants, enabling them to recolonise the area and for monitoring species regeneration.
- promoting citizen science in the form of warren mapping and understanding rabbit abundance and behaviour (use of a warren smoker and recording data using RabbitScan, following training in the application), as a step toward better control within the reserve.
- vegetation monitoring through a combination of vegetation quality mapping, photopoints, citizen science and quadrat data analysis, to help assess the effectiveness of the program.
- weed control and erosion control, seed collection and revegetation.

The Surf Beach Sunderland Bay Coastcare Group is working with Phillip Island Landcare, as part of the Phillip Island Coastcare Blitz, funded by Coastcare Victoria. The Surf Beach Sunderland Bay Coastcare Group also holds monthly working bees with Phillip Island Nature Parks to restore land eroded by rabbits.

The work is a great example of tackling a multi-faceted environmental problem (rabbits, penguins, bandicoots, vegetation decline and feral predators) with a mixture of social and environmental solutions, in a complex local community. Neat aspects are that it can align the control of rabbits and feral cats, delivering the best overall outcomes, as well as showcasing some informed technical control options and innovative community engagement (asking people to 'own the problem' and get involved in fixing it by rabbit-proofing their homes). Its real strength is the local leadership and initiative shown, and collaboration between community groups, organisations and agencies.

### For more information:

Gayle Seddon, Coordinator, Surf Beach Sunderland Bay Coastcare Group

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<https://www.facebook.com/profile.php?id=100008985073209>

[surfbeachsunderlandbaycoastcare.wordpress.com](http://surfbeachsunderlandbaycoastcare.wordpress.com)



*When a COVID-19 lock-down turns a field day into an online community conversation.*

# Learning on the job.

## How to use K5 on large reserves in arid regions.

### Background

Rabbit numbers are on the increase on Nature Foundation's two largest nature reserves, Witchelina (421,000 ha in South Australia's far north) and Hiltaba (78,000 ha on South Australia's Eyre Peninsula).

"When Calicivirus was first released it was very successful," said Alex Nankivell, Nature Foundation's Science and Knowledge Program Manager.

"Although the numbers have not recovered to pre-Calicivirus numbers, they still persist in lower densities and they still impact the native vegetation and pasture.



*Country typical of where the warrens are found on Witchelina Nature Reserve, far north South Australia (Photo: J Ovenden)*

### RHDV-K5 trail

"We decided to undertake a trial using RHDV-K5 as a serious management strategy for rabbits, in lieu of the more traditional mechanical ripping of warrens because of the risk of damaging cultural heritage sites without proper heritage clearances, which is difficult to do over such a large area. And it damages vegetation, too."

The trial commenced in autumn 2021 and it has been quite a learning curve for Alex and John Ovenden, the reserve manager overseeing the project on a day-to-day basis.

The location for the first trial was selected in the southern part of Witchelina where the sandy soil has vegetation cover. Warrens were surveyed and recorded on a GPS and marked with flags. Only 26 warrens were selected for several reasons; low density of warrens in the arid landscape, their location relative to the homestead as daily round trips of 136km over difficult terrain were required and short day length.

Soil near each warren was scraped with a shovel and for four days prior to treatment, untreated oats were placed in these scrapes by hand. On the fifth day, 5kg of oats were treated with K5 according to the directions and distributed on the scrapes.





*Oats spread on soil disturbed with a shovel (a scrape) near Buck Heap at Witchelina Nature Reserve.  
(Photo: J Ovenden)*

A second trial was carried out a few weeks later in a different location. To date, staff have not been able to return to the sites to assess the results.

Assessing the impact of the trial will be challenging because it was difficult to know how many rabbits were using each warren before the treatment. However, three camera traps located near the warrens should provide some information about post-treatment rabbit activity.

“It’s early days,” said Alex. “We only started this year in autumn. We’re developing internal procedures, rolling out the program and still understanding the things you need to consider and how you do it over a large area for biodiversity.”

Alex is also developing a phone app (Fulcrum) as a tool to make data collection easy for the reserve managers via their mobile phones.

## Challenges

As with any new management process there are challenges and Alex, John and the rest of the reserve managers are working through them.

- **Timing of the release:** Everything has to come together perfectly; no green feed available, flies present, trained staff on site and no unweaned kittens present (which develop immunity if their mothers are exposed) which is challenging in arid areas where breeding is less seasonal. The trial at Hiltaba has been delayed until early summer because of rain and a cold snap.
- **Follow up treatment:** K5 treatment should be followed up with warren ripping or laying of Pindone-laced carrots. This is difficult on both properties which are managed for conservation. Ripping is undesirable because of the damage it may do to cultural heritage sites and vegetation, and it disturbs the soil which can cause weed growth. In addition, Hiltaba has wombats.
- **Quantities:** One vial of K5 can be used to treat 100 or more warrens and needs to be used within 24 hours once opened. On Nature Foundation’s large properties where rabbit warren densities are low, it is difficult to use all the treated oats. We are looking to work with neighbouring properties where owners are also interested in conducting trials and sharing the excess treated oats with them.

# Rabbits, witchetty grubs and bilbies

Rabbits cause all sorts of problems for native animals – and sometimes they are a bit tricky to unravel. An example is how they affect witchetty bush, witchetty grubs and bilbies.

Witchetty bush (*Acacia kempeana*) is found in arid areas of Australia, especially Western Australia, South Australia and the Northern Territory. It grows up to 5 metres high, but it takes a long time to get that big because it is only found in areas with low and erratic rainfall.

Large Cossid moths (*Endoxyla spp*) lay eggs under the trees and the larvae (Witjuti or witchetty grubs) feed on the sap of the witchetty bush roots. The grubs are tucker for Indigenous people and a favourite of the greater bilby (*Macrotis lagotis*). Edible gum and seeds are also sourced from the trees, as is bush medicine and wood for spears. The plants also support birds (nesting and foraging), insects (galls and pollinators), and ants (seed harvesters) – as well as any bilbies dining on the witchetty grubs.

Some plant species, especially when they are seedlings, are like chocolate to rabbits. Rabbits sniff them out and eat every one, just like children on an Easter egg hunt. Witchetty bush is one of those plants that rabbits like to eat.

As a result, there is very little regeneration of witchetty bushes in areas where there are rabbits, so there are fewer witchetty bush, with young ones being especially rare, and there are fewer witchetty grubs for bilbies to eat. It can take 10-20 years before bushes are tall enough to be safe from rabbits. Decades of rabbit control would be required for regenerating plants to survive.

One place to still support witchetty bush and bilbies in the wild is the rabbit-free [Birriliburu](#) Indigenous Protected Area in WA.



Witchetty grubs. Image: Alan Yen [ABC News](#)

## References:

- Commonwealth of Australia (2019) 'Recovery Plan for the Greater Bilby – DRAFT'.
- Cowan K '[Witchetty Bush](#). Junior Ranger Nature Notes'. Northern Territory Government.

# Dinner Time

Poor bilbies! The rabbits have eaten so much of their food. Help Easter Bilby find his dinner.

Colour the trail that leads past all the dangers and obstacles to the witchetty grub.

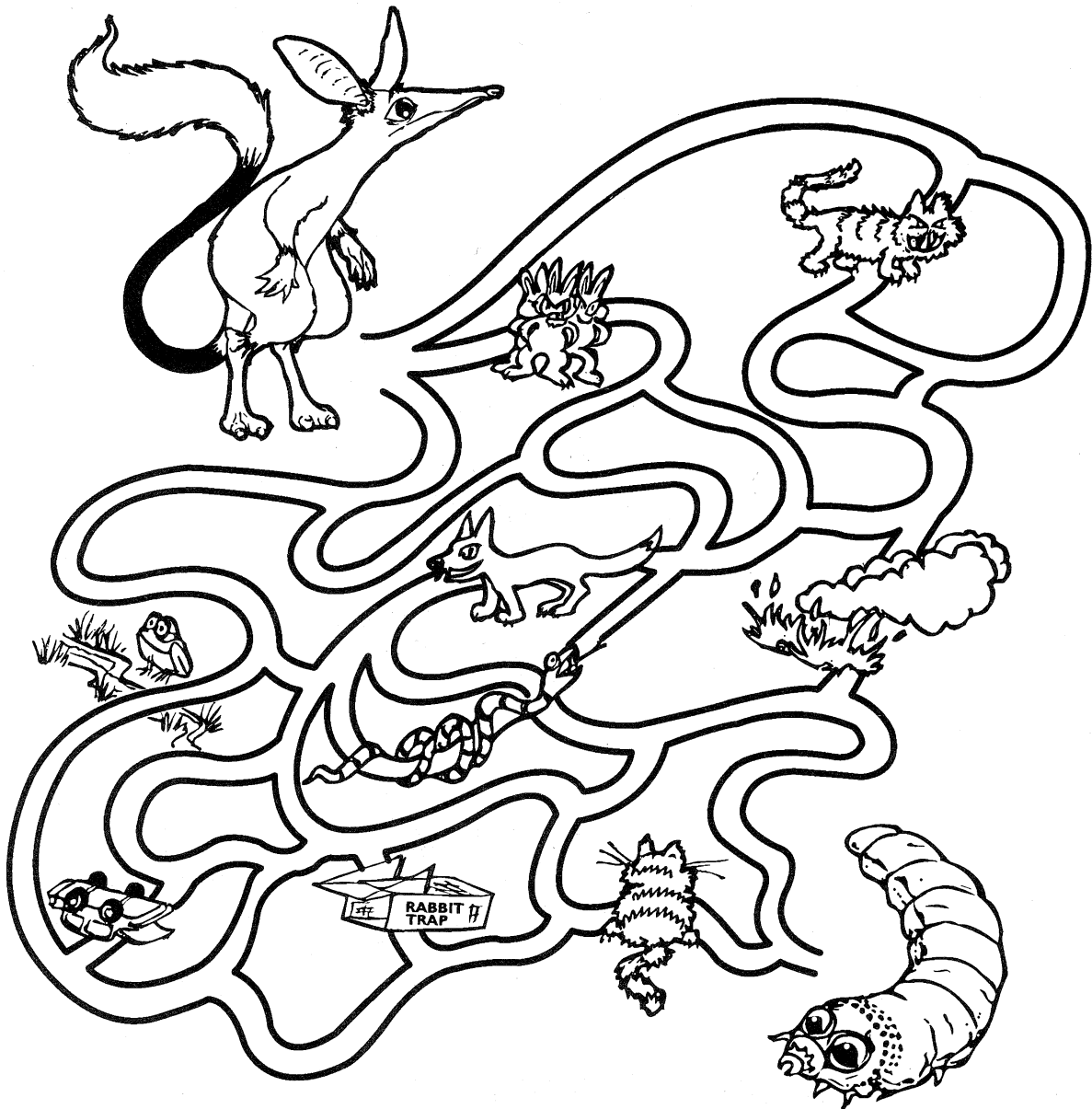


Image: Ali Garnett & Kaye Kessing (1995) 'Easter Bilby Action Pack'



## About Dingoes and Rabbits

A few years ago, it was in vogue to declare that dingoes were the unsung heroes of conservation in Australia. Advocates argued that having dingoes about suppressed cats and foxes, and hey presto, native animals could be expected to return to former habitats.

Some researchers even began to argue that, not only could dingoes suppress cats and foxes, but they also held rabbit numbers low. But what was the evidence for such a statement? If dingoes were highly efficient predators of rabbits, how did rabbits so easily become established throughout inland Australia in the first place? Furthermore, early pastoralists in the Strzelecki region, like the Ragless brothers who took up a lease in 1882, reported that it was only after rabbits arrived in 1888 that dingoes increased and began worrying their sheep. Rather than suppressing rabbits, did dingoes benefit from having over-abundant rabbits as a new food source?

Surprising as it may seem, there are many opinions but no serious research to determine whether dingoes are able to suppress rabbits. Certainly, rabbits, make up over 60% of dingo diet in many parts of inland Australia. However, rabbits also make up a high proportion of the diet of introduced feral cats and red foxes.

The best information we have for understanding whether predators suppress rabbits comes from studies carried out at Yathong Nature Reserve in western New South Wales where cats and foxes were experimentally culled from part of the study area and changes in rabbit abundance were recorded over many months before predators were allowed to return. An adjoining area where predators were not culled was used for comparison.

It turned out that, where predators were eliminated, rabbits increased to much higher levels than on the area where predators remained, but when predators were allowed to return, they were unable to reduce rabbit abundance again. Rabbits remained numerous until food shortage and excessive numbers caused the population to crash. The researchers considered that this was evidence that predators could keep rabbit populations low under some circumstances, yet in good seasons, or if there were too few predators, the rabbits could become so numerous that predation could no longer suppress them.

Prior to the introduction of rabbit haemorrhagic disease (RHD), first released in 1995, rabbit plagues were frequent on Quinyambie cattle station in the southern Strzelecki region. These plagues occurred every five to seven years, usually following good seasons, despite dingoes being common. These population irruptions were clear indications that rabbits were able to breed so efficiently that they produced more progeny than the dingoes could hunt and eat.

Putting all the details above together, we can safely conclude that rabbits on Quinyambie were not consistently limited by dingo predation. That was only likely if drought and associated food shortage temporally lowered rabbit productivity. Nonetheless, when RHD was introduced, it too reduced rabbit productivity by killing large numbers of sub-adult rabbits and this may have allowed predatory dingoes to play a more consistent role in keeping rabbits low. This might explain why researchers who have only studied the role of dingoes in the last couple of decades believe that dingo predation is so important. However, they err in failing to give credit to rabbit biocontrol as being critically important too.

Again, we don't have direct experimental evidence, but interactions between foxes, disease and rabbits provide some supporting evidence. When European rabbit fleas were introduced into Australia as vectors of myxomatosis, they spread myxomatosis in the cold winter months rather than in summer when mosquitoes are active.

This meant that rabbits became infected with myxomatosis while young. Low temperatures further enhanced disease severity making the rabbits easier prey for predators and providing more carcasses to scavenge. Under those circumstances, foxes benefitted, their numbers increased relative to rabbit abundance, and the rabbit population remained very low. Nonetheless, when severe drought killed the rabbit fleas on the study site, and myxomatosis reverted to normal mosquito-borne summer outbreaks, the rabbit population increased rapidly, and the ratio of foxes to rabbits fell.

The simplest explanation was that a combination of wintertime myxomatosis carried by rabbit fleas and predation had been highly effective in keeping rabbit abundance low. But, once rabbit numbers rose, predation was ineffectual in controlling their abundance. If there are similar interactions between RHD and dingoes, then dingoes could be adding to the effectiveness of RHD over much of inland Australia beyond the dingo fence, when RHD is active.

Overall, there is plenty of historic evidence to safely conclude that dingoes alone cannot prevent rabbits from reaching plague numbers and causing extreme ecological damage. In today's degraded ecosystems, rabbits are by far the most common prey and consequently they are the major prey of many predators. More importantly, even if dingoes help to keep rabbit numbers down, even with RHD and predators combined, rabbits are seldom reduced below a level of about 0.5 rabbits per hectare which is a prerequisite for regeneration of many palatable native plant species.

It is a myth that dingoes alone could control rabbits well enough for ecological restoration and this needs to be dispelled. Unfortunately, one problem with today's electronic media is that news which is controversial gets put up as headlines to attract readers attention, whereas useful basic research is rarely considered newsworthy. Hence, it seems controversial information, such as the idea that dingoes can suppress rabbits, stays on the world-wide-web forever, even if it is wrong. It pays to be cautious and always check that controversial opinions can be verified.

But, for now, the message is: *Dingoes can't suppress rabbits well enough to prevent continuing ecological damage.*

### Further reading

Cooke, B.D. (2019). Does red fox (*Vulpes vulpes*) predation of young rabbits (*Oryctolagus cuniculus*) enhance mortality from myxomatosis vectored by European rabbit fleas (*Spilopsyllus cuniculi*)? *Biological Control*, 138, <https://doi.org/10.1016/j.biocontrol.2019.104068>

Cooke, B. D., & Soriguer, R. C. (2017). Do dingoes protect Australia's small mammal fauna from introduced mesopredators? Time to consider history and recent events. *Food Webs*, 12, 95-106. <https://doi.org/10.1016/j.fooweb.2016.04.002>

Corbett, L., & Newsome, A. (1987). The feeding ecology of the dingo. III. Dietary relationships with widely fluctuating prey populations in arid Australia: An hypothesis of alternation of predation. *Oecologia*, 74(2), 215-227. Retrieved July 21, 2021, from <http://www.jstor.org/stable/4218457>

Pech, R.P., Sinclair, A.R.E., Newsome, A.E. *et al.* (1992). Limits to predator regulation of rabbits in Australia: evidence from predator-removal experiments. *Oecologia* **89**, 102–112.

Blog for Rabbit-Free Australia by Brian Cooke, Sept, 2021.