

Hidden Vale Tails

— HIDDEN VALE WILDLIFE CENTRE NEWSLETTER —



Saving the Bilby

The Hidden Vale Wildlife Centre recently took delivery of three bilbies as our first step in a breeding program to help save this endangered animal.

The three male bilbies will establish themselves in newly-created enclosures. Once settled, two females will be introduced to enable a breeding program to commence. Ultimately it is hoped that Hidden Vale will contribute six to eight bilbies each year to be relocated to specially fenced areas in western Queensland.

The Greater bilby (now really just “the bilby” as the Lesser bilby was declared extinct in the 1950s) has a national conservation status of vulnerable, threatened in Queensland and extinct in New South Wales.

Bilbies inadvertently get embroiled in boom-bust cycles in arid Australia. After rain, the desert flourishes, especially another Australian native species called the long-haired rat (*Rattus villosissimus*) which is capable of producing 12 young every three weeks in ideal conditions. In response, feral cats migrate and breed to much larger numbers. But when rat numbers plummet, the cats “prey switch” to bilbies—with devastating consequences for both species.

Continued next page...

Above: ‘Finnian’, one of three male bilbies at Hidden Vale Wildlife Centre.
Photo: Karmen Butler

The Hidden Vale Wildlife Centre is a collaboration between the Turner Family Foundation and The University of Queensland into the study and research of native ecosystems and wildlife.

Further information is available at turnerfamilyfoundation.com.au and hiddenvalewildlife.uq.edu.au



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

The Greater bilby was once found across 70 per cent of the Australian mainland, from the Western Australian coast, eastward to the Great Dividing Range. Today, wild bilbies are now only found in the Northern Territory, central and north-eastern Western Australia, and in small, isolated populations in Queensland's far west.

It is widely agreed that cats and foxes were the main cause of the demise of the Lesser bilby because the landscape was considered not significantly altered by clearing, grazing or fire regimes at the time of its disappearance.

Controlling cats and other predators is incredibly expensive. Adoption of thermal vision technology to locate feral predators has resulted in the removal of 3,000 cats since 2013 from Astrebla Downs National Park, located in the Channel Country of outback Queensland, and an increase in the number of bilbies and other native mammals. The most recent survey in June recorded 471 bilbies.

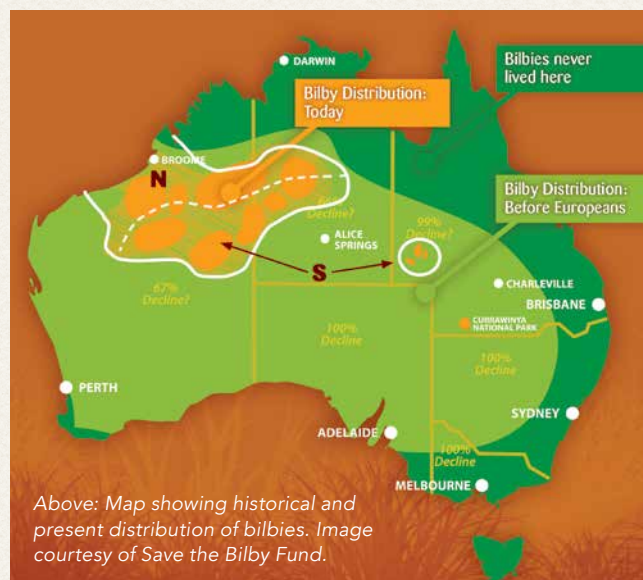
At Currawinya National Park, on the Queensland–New South Wales border, bilbies are kept within an exclusion fence surrounding 25 hectares that keeps cats and other predators out. Exclusion fences are expensive to build and maintain but they are the most effective tool to achieve the end goal of establishing self-sustaining populations of bilbies.

Around 50 bilbies have been released at Currawinya, and are believed to have bred up to more than 150 animals.

Much more refinement in predator control will be required to have bilbies living in Queensland without fences, but ultimately, this is the goal. The success of the release project is being monitored in a PhD project. This program is being managed by the Zoo and Aquarium Association in collaboration with the Save the Bilby Fund, and soon Hidden Vale Wildlife Centre will join the breeding program to provide an increased supply of bilbies into the fenced refuges in western Queensland.

The continuing presence of bilbies in zoos prevents them becoming forgotten, invisible, mythical to the Australian public, or just a chocolate effigy to be enjoyed each easter.

At Hidden Vale Wildlife Centre, we urge you to support our collaborators, the Save the Bilby Fund savethebilbyfund.org.au/help-bilbies/ or donate to the Turner Family Foundation to support our research contributions.



Facts about bilbies

- Bilbies are highly mobile and can have large foraging ranges. Radio collared adult females have been known to move up to 1.5 kilometres between burrows on consecutive days, while adult males regularly move two to three kilometres and up to five kilometres between burrows on consecutive days.
- A bilby's wild diet consists of invertebrates such as butterfly and moth larvae, termites, ants, grasshoppers, spiders and beetles, and other items such as seeds, bulbs and fungi.
- Bilbies create numerous 'compost pits' every night with their feeding digging. Their more substantial spiral-shaped refuge burrows can be up to three metres long and almost two metres deep. Their vacant burrows are used by other native creatures.
- Female bilbies can give birth four times a year, producing up to eight young.



Above: Bilbies settling in to their new enclosures at Hidden Vale Wildlife Centre. Photos by Karmen Butler.



Fire returns to Old Hidden Vale

The impacts of the 2019/2020 bushfires that ravaged eastern Australia reinforced the importance of appropriate fire management for the preservation of ecosystems and assets.

After a two-decade hiatus, the recent reintroduction of fire to Old Hidden Vale Station was a welcome change. After conducting a cultural burning workshop in 2019 and consultation with various fire practitioners and advisers, including indigenous fire practitioners and the Queensland State Fire Department, a series of burns were planned and conducted over the cooler months of 2021. The intent of these fires was twofold: 1) to reduce fuel loads and provide fire breaks to help in the event of an uncontrolled wild fire during summer, and 2) to commence a series of mosaic burns consistent with suggested fire regimes for our regional ecosystems, to enhance ecological restoration of the property, using fire to assist with weed management and promoting germination and return of various native species.

Fire had been absent from the Old Hidden Vale property for a number of reasons including the complexity to undertake burns on a 4,560 hectare property with over 60 neighbours and limited personnel available for fire management. The ability to conduct a successful fire management regime is complex and is dependent upon:

- **Time of year** – it is often better to conduct burns over the cooler months when the fires are less intense and self-extinguish with the evening cool change.
- **Wind and other weather patterns** – not just on the day but in the weeks following – for example, is the wind speed and direction suitable for the proposed burn?
- **Soil moisture** – is the soil too moist to prohibit an effective burn or is it too dry posing a risk that the ground cover is too dry and the fire will run away faster than what's planned?
- **Topography** – fires burn uphill quicker than downhill (for every 10 degrees of slope, a fire will double in speed) – so in steep country a fire will progress at great speed.
- **Fuel loads** – both fine and elevated fuels (including elevated bark) should be assessed – both quantity and arrangement determine fire behaviour.

- **Vegetation types** – this influences fire intensity, but can also determine other planning factors if particular species are needing special management.
- **Boundaries and neighbours** – ensuring that the burn is contained within property boundaries so that neighbours are not impacted.

Aligning these factors and coordinating resources for a safe and effective ecological burn can be challenging. These parameters then should be coordinated with the specific fire regimes outlined for each regional ecosystem. Given Old Hidden Vale is predominantly regional ecosystem 12.9-10.2 that has a varied recommended fire regime of four to 25-year intervals, through to a three to six-year interval for regional ecosystem 12.8.17, we need to conduct around 430 hectares of ecological burning each year. This is an aspirational goal.

The strategy for the next few years will be to prioritise ecological burns around high value and/or endangered regional ecosystems (e.g. semi-ever-green vine thicket) that are fire sensitive and may need active protection from wildfire in extreme conditions. We will also seek to improve identified high value wildlife habitat areas for animals such as bettongs, koalas and critical weight range terrestrial vertebrates.

Now that fire has returned to our properties, the ultimate goal is to conduct a series of annual slow, cool fires where fire and smoke assists with germination of native species in order to restore structure and diversity in native vegetation communities that have long suffered the effects of weeds, grazing and other human land use. A slow cool burn also allows more time for animals including insects to seek shelter from the fire. Young trees can survive a cool fire as the oil in their bark does not ignite. A core goal of this type of burning is to avoid the fire reaching the canopy as this provides shelter for animals, it protects the tree and does not impact its cyclic renewal.

Fire and Australia's ecosystems interdependence have been well documented. The challenge of implementing a comprehensive ecological fire regime is substantial when the factors of weather, timing, ecosystem requirements, and personnel considerations are combined in a highly modified environment. Ultimately, the cost of not implementing an appropriate ecological fire regime is the potential catastrophic devastation of the underlying ecosystems that we are preserving. This is a cost and impact that we wish to avoid. So, while fire has returned to Old Hidden Vale, it is set to stay and you can follow our progress in the future as we map and track the outcomes. 3



Wilson's story:

a koala's journey back to the wild

Being a koala in today's world is no easy feat, with many hurdles and risks to overcome before enjoying the relaxed life in the fork of an Aussie gum.

Wilson arrived at the Hidden Vale Wildlife Centre as an 11-month-old male koala, together with his three-year-old mother, Josica. Both showed obvious signs of disease. After an initial assessment, they were admitted to Endeavour Veterinary Ecology's care in November 2020 for what was to be a long journey of treatment. Young Wilson, weighing in at just 1.4 kilograms, had an infection in one eye and was anaemic. Josica also had an eye infection, as well as cystitis and overall very poor body condition. Sadly, and despite close veterinary care, Josica's condition continued to deteriorate and she did not survive treatment.

While on antibiotics for his chlamydial conjunctival symptoms, Wilson developed a number of illnesses including diarrhoea, gastrointestinal candidiasis, bilateral conjunctivitis, rhinitis, pneumonia and a lung infection. His antibiotic treatment had to be paused during certain parts of his care for fear of destroying his gut bacteria and intensifying his gut candidiasis.

Over Christmas in December 2020, he was transferred to Australia Zoo Wildlife Hospital (AZWH) ICU for further around-the-clock care. After enduring another bout of gastrointestinal candidiasis, he returned to the Hidden Vale Wildlife Centre and a purpose-built koala enclosure where he could easily be observed and examined.

As fate would have it, Wilson's left eye once again became gummed with conjunctivitis and his pneumonia returned, requiring continued care and another round of antibiotics at AZWH.

After almost four intense months in hospital since his initial capture, Wilson was finally deemed healthy and officially ready to be discharged. In March 2021 he arrived back at Hidden Vale where his condition, feeding, behaviour, health and weight were monitored closely.

As part of returning him to the wild, we needed to transform him from the cuddly koala he had become during his care, to a bush-smart survivor, ready to take on the rugged bushlands of Old Hidden Vale Station. To satisfy the release protocol, Wilson needed to pass a number of health milestones.

As well as testing negative to chlamydia, Wilson received a two-shot koala vaccine. His weight needed to be at least four kilograms and he needed to display behaviours that indicated his readiness to survive independently in the wild.

Another four months passed under observation at the Centre before Wilson reached all of his milestones. On 12 August 2021, according to protocol, he was fitted with a GPS and VHF collar and moved to a fenced soft release enclosure very near to where he was originally caught with his mother. This enclosure contained 13 koala food trees to choose from at various heights of up to 30 metres. The trees had no overlapping branches which might allow him to "jump the fence" and escape.

This meant Wilson could practice being a wild koala while safely separated from the established population he was returning to. It also meant we had the ability to monitor and assess his progress before eventually setting him free.



Wilson in care at EVE Koala Hospital



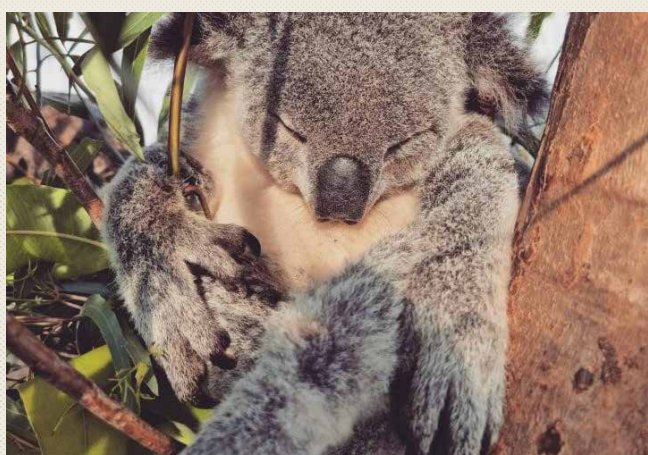
Wilson at Australia Zoo Wildlife Hospital, 17 December, 2020



Wilson in recovery



Wilson on his return to the Hidden Vale Wildlife Centre



Wilson relaxing in his HVWC enclosure

He was checked daily and provided with supplementary feed, while wildlife cameras and sound recorders ('audio moths') provided additional behaviour and environmental data, allowing the detection of other koalas, wildlife or predators nearby.

Twelve days later, Wilson's enclosure was opened to allow him the choice of leaving on his own reconnaissance within his new home. He took his time making his mind up, but two days later he crossed out of the enclosure and set off to explore!

Wilson was tracked daily for a week, then weekly after that. He travelled around five kilometres within the vicinity of his release site before settling to a small but stable home range about 1.5 kilometres from his release site.

Wilson will continue to be monitored as part of our ongoing koala monitoring program, and will hopefully pave the way for future koala "return to the wild" success stories. After such a tough start,, we are in awe of Wilson and his success in re-establishing himself as a wild koala. This would not have been possible without the devoted staff from Endeavour Veterinary Ecology, Australia Zoo Wildlife Hospital and the field, management and husbandry team at the Hidden Vale Wildlife Centre. We thank all of these dedicated professionals for their wonderful care, and for being part of Wilson's journey back to the wild!



Above: What life looks like through the eyes of koala Robyn, eating a gum leaf breakfast as the sun rises on the horizon.

Our koalas on the BBC

Hidden Vale's koalas recently featured in BBC TV's "Animals with Cameras" documentary.

A BBC TV documentary team came to Hidden Vale in late 2020 and attached specially-designed collar cameras to several of our koalas with the aim of recording their movements at night. This unique footage revealed that the koalas travelled further at night than we thought—often proceeding slowly and cautiously for periods, followed by fast-paced movement to their next tree to climb and shelter in.

Despite their reputation as sleepy layabouts, koalas can be remarkably active under the cover of darkness.

To see what they get up to, the BBC team created a programmable camera that would record for four hours between dusk until dawn, and fitted it with infra-red lights, invisible to the koalas but not the cameras.

The camera was attached to the koala using a special neck collar, based on a GPS tracking device used by our team to monitor their movements. The camera was able to swivel forward and backwards so it would always be pointing in the right direction and not get in the way of their arboreal activities.

The team also installed a remote-control release mechanism so that the camera would drop off without needing to catch the animal again.

**"Animals with Cameras"
Episode 2 of Series 2 aired
on 16 September. At this
stage, the series is only
available in the UK. If you
have friends or relatives
in the UK, please share this QR code and
encourage them to watch the episode
starring the Hidden Vale koalas.**





Image: Meadow Flat, Hidden Vale

A major revegetation project is creating valuable habitat for Hidden Vale's koala population. It's also unlocking opportunities for green carbon capture.

Revegetation of Meadow Flat has been strategically designed to link known populations of koala on the floodplain of Franklin Vale Creek to populations of the Little Liverpool Range to the west.

Meadow Flat is 125 hectares in area, with the planting program covering 29 hectares.

Over many years it was heavily farmed with crops which compacted the soil and depleted the natural seed bank. This presented the opportunity to experiment with strategies to overcome this agricultural legacy and effectively restore Eucalypt woodlands on Hidden Vale, and potentially on similar ex-agricultural land across south-east Queensland.

As part of the Hidden Vale Wildlife Koala Conservation Project, survey work completed since 2018 identified that koalas situated in this eastern corner of the property would benefit from extra habitat and a movement corridor that linked this eastern section with the main Hidden Vale parcel. The aim of revegetation is to:

- assist natural regeneration by establishing emergent, canopy and understory species to restore natural canopy structure
- enhance the quality of the habitat for koalas by increasing koala food tree abundance and supporting koala habitat
- control environmental weeds which degrade koala habitat quality and health.

In the first half of 2021, Dr John Dwyer of The University of Queensland's School of Biological Sciences designed an experiment involving the planting of 20,500 tree seedlings in 118 plots, each measuring 40 metres by 40 metres (1,600 square metres).

Each plot was prepared by ripping a planting line to 30 centimetres depth with a three metre centre line between rows. Seedlings were planted at three metre intervals, ensuring 169 seedlings per plot. These rows were ripped six weeks prior to planting so that any dormant weed seed bank could germinate and then be poisoned to ensure that emerging weeds would not smother the freshly planted seedlings.

The experimental treatments included two soil additions—native topsoil to introduce beneficial soil microbes, and granulated compost as a source of carbon and nutrients—as well as 16 different planting mixtures, varying from monocultures to six-species mixtures.

All tree species used in the various mixtures occur naturally as part of Regional Ecosystem 12.3.3 (forest red gum woodlands on alluvial flats), including multiple koala food tree species. The various experimental treatments were applied factorially, so that each combination was represented multiple times across the site. In the short-term, we have PhD and Honours students assessing how effective the soil treatments are in terms of seedling establishment and growth, as well as investigating if the addition of native topsoil actually kickstarts recovery of a more 'natural' soil microbial community.

In the longer term, we will investigate how the different mixtures develop into woodlands and how well they sequester carbon.

In addition, two of the chosen species—Queensland blue gum (*Eucalyptus tereticornis*) and narrow leaved ironbark (*Eucalyptus crebra*)—were sourced locally and also from a drier climate at Middlemount, in Central Queensland. Middlemount has 100 millimetres less rainfall a year and is hotter every month of the year than the local environment at Hidden Vale. The inclusion of 'dry' and 'local' provenances tests the idea of climate adjusted provenancing, where we might expect ecotypes from drier climates to perform better than local ecotypes in the long run, as climate change escalates.

In the longer term, we will investigate how the different mixtures develop into woodlands and how well they sequester carbon.



Image of Meadow Flat before planting

This restoration project was a result of a partnership between the Turner Family Foundation (TFF), The University of Queensland, Queensland Trust For Nature (QTFN), Greenfleet and the Queensland Government. Each party contributed to the project to achieve specific goals.

Greenfleet assisted with the plantings in exchange for being assigned the carbon that the trees sequestered. QTFN and the Queensland Government helped coordinate and fund the plantings, while TFF and the local koalas will benefit from the additional habitat. This model of co-benefit is becoming increasingly popular as more outcomes can be achieved through better coordination.

The table below lists the species mix planted on the site:

	Scientific Name	Common Name
1	<i>Acacia glaucocarpa</i>	Hickory Wattle
2	<i>Acacia salicina</i>	Black Wattle
3	<i>Angophora floribunda</i>	Rough barked apple
4	<i>Angophora subvelutina</i>	Broad leaved apple
5	<i>Corymbia citriodora</i> subsp. <i>variegata</i>	Spotted Gum
6	<i>Corymbia intermedia</i>	Pink bloodwood
7	<i>Corymbia tessellaris</i>	Moreton Bay ash
8A	<i>Eucalyptus crebra</i>	Narrow-leaved ironbark
8B	<i>Eucalyptus crebra</i> (dry)	-
9	<i>Eucalyptus moluccana</i>	Grey gum
10A	<i>Eucalyptus tereticornis</i>	Red gum
10B	<i>Eucalyptus tereticornis</i> (dry)	-
11	<i>Lophostemon suaveolens</i>	Swamp box
12	<i>Melaleuca irbyana</i>	Swamp paperbark



(L to R) are Sam Morison, Kellie Schuring, Jared Wolff and Danyel Wolff.

New Staff Appointments

We are pleased to welcome some new staff additions to the Hidden Vale Wildlife Centre.

Our hands-on learning and research support programs will be invaluable to these keen conservationists. And we have plenty of work for them to do!



Martin & Shamala Oakes

Team in profile

The Hidden Vale Wildlife Centre is just one venture operating on the larger Hidden Vale property.

Farm managers Martin and Shamala Oakes are in charge of the farming and cattle enterprises at Old Hidden Vale Station. This includes innovative farm management techniques that enable both cattle and wildlife to thrive.

Bottles Of Joya

Student Joya Stent, of Saint Andrews Anglican College, Peregian Springs, has been lending a helping hand for the koalas of south-east Queensland. In addition to collecting funds from her own returnable bottles and cans, Joya partnered with 'Containers for Change' who provided her with bottle bins. She branded the bins and distributed promotional material while her family and friends also pitched in to take her bins across the Sunshine Coast.

Joya has collected more than 6,000 containers (to return to the good people at Containers for Change), raising \$600 towards helping koalas by donating to the Hidden Vale Wildlife Koala Conservation Project.

Joya and family recently visited the Centre where we were able to acknowledge her donation with a certificate and show her a koala in the wild - a first for her.



Above: Joya Stent (second from right), beside Jude Turner, along with family members and Hidden Vale Wildlife Centre's Dr Andrew Tribe

2022 research opportunities at Hidden Vale

These Hidden Vale Project opportunities are suitable for students/researchers with a background in Ecology. Further supervisors (principal or co-supervisors) for several of these projects are also welcomed. Resources are available to support all projects.

- Commensal dung beetle-rufous bettong relationships: implications for population health and ecosystem function. Honours or PhD available from June 2022
- Improving methods for capture and population estimates of rufous bettongs. Honours available from June 2022
- Continued development of the Mata Hari Judas Vixen for innovative fox management techniques. Honours or PhD available from June 2022
- Beyond the fence: development of wildlife 'safe havens' in connected landscapes. PhDs available from June 2022

- Rufous bettong habitat utilisation, home range and activity overlaps with predators (foxes, cats, dogs, quolls). Honours or PhD available from June 2022
- Use of microchip-automated devices for wildlife conservation in connected landscapes. PhD available from June 2022
- Gut microbiome impacts on social interactions and predator avoidance in Eastern chestnut mice. Honours or PhD available from June 2022
- Determination and restoration of landscape carrying capacity for threatened and declining species. PhD available from June 2022.

Dates are anticipated availability. Project details and teams are subject to change.

**For further information contact
Dr Megan Brady via email at
megan.brady@turnerfamilyfoundation.com.au**



If you would like to support our work, scan the QR code and make a tax deductible donation. All funds go to on-the-ground projects supporting the ecological restoration activities being undertaken by the Turner Family Foundation.



To find out more or to donate to the Turner Family Foundation visit www.turnerfamilyfoundation.com.au