# Hidden Vale Tails

- HIDDEN VALE WILDLIFE CENTRE NEWSLETTER -

## MEEKA'S STORY OF SURVIVAL

They say it takes a village to raise a child. The same African proverb can be applied to Meeka (right), a young male koala rescued, raised and recently translocated to the Hidden Vale Research Station.



Above: Meeka, aged around six months, with his "foster Mum" at Queensland Koala Society earlier this year. Photo by Peter Wilson.

Meeka's story is one of survival and dedication from a broad team of carers and wildlife experts. Following a chance discovery by a walker in February 2022 at Whites Hill Reserve, on Brisbane's southside, Meeka was found facedown in a pile of leaves and dirt, almost drowned by torrential rain and flooding.

He was rescued by Angela Christodoulou of the Queensland Koala Society (QKS). Meeka required days of intensive care by RSPCA staff, particularly veterinary nurse Jaimee Blouse, before he could be returned to QKS for hand-rearing.

Once weaned, Meeka was transferred to the Moggill Koala Rehabilitation Centre's 'koala kindy' before graduating to the plantation enclosures.

Meeka was eligible for translocation due to his age and the lack of sufficient protected and connected habitat at his rescue location.

Now aged about two years old, Meeka has been translocated to the Hidden Vale Research Station. He was initially held in an enclosure to allow close observation of his behaviour, and to ensure gut flora adaptation to Hidden Vale's koala food tree species. It was here that Meeka started to test his bellow – a sign that he was reaching puberty. (Click or scan the QR code on page 2 to hear Meeka's bellow.)

Hidden Vale Wildlife Centre Manager, Dr Zeke Davidson, said: "We observed him and collected data on his behaviour, genetics, gut microbiome and all of the evidence we are collating to study the impact of translocation. That's our role – we are the last link in the chain."

Meeka was transferred to a 'soft release' enclosure on 8 November, which he chose to leave a week later. Since then, he has been moving about his natural environment and is found most days contentedly sleeping in his favourite Grey gum trees.

Location tracking devices fitted to a collar and an ear tag will ensure that Meeka can be tracked and checked, initially daily, until he settles into the local koala population.

Meeka's translocation, along with another young female koala, Elsa, mark numbers six and seven in the Hidden Vale koala translocation project – not including "Koala Zero", Wilson, who was studied in the initial design and development of the project. (Read Issue 9 of Hidden Vale Tails for more about Wilson's story.)

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

The koalas translocated to Hidden Vale are fortunate to have access to large tracts of eucalypt forest that connect to the Main Range National Park. The Hidden Vale property is carefully managed to reduce the impacts of fire and weeds. A number of landscape restoration projects are underway. The property supports a natural koala population that has been studied extensively over the past five years.

"We need to collect good data and understand how to create the best strategy possible to move koalas significant distances from their natural ranges (where they started life with their mothers) and introduce them to a new natural environment," Dr Davidson said.

Special effort, including carefully preparing a protected softrelease enclosure with audio recorders and camera traps to understand the local environment, timing koala releases with good weather at the right time of day, and vaccinating them against chlamydia, all help minimise the risk of translocation.

"Our previous pair of females, Blueberry and Sweet Pea, were released on the cusp of the breeding season and quickly attracted a resident adult male, named Coen," Dr Davidson said. "He visited them in the enclosure, and they have stayed close since. We look forward to seeing how that match works out.

"All the animals we have for translocation have spent some time being handled by humans, so we spend a lot of time easing them back into the wild, and monitoring them to understand the impacts of the rehabilitation and release process."

Particular attention is paid to their adoption of the local food source.

"Koalas have a finely-tuned digestive system, taking up to two weeks to process their very fibrous and toxic leaf resource," Dr Davidson said. "Their gut microbiology (bacteria) will determine how well they can digest the food, so we need to carefully monitor this to learn whether they can get the nutrition they need from the tree species available in their new landscape."

The outcome of the Hidden Vale Research Station project may contribute to current thinking on the practice and policy of wildlife translocation.

"We will be looking to show whether or not koalas can be safely translocated beyond a five-kilometre radius of their rescue location, which is the current regulation," Dr Davidson said.

Meeka has been translocated 65 kilometres from his natural home forest at White Hills Reserve.

"Initial indications from the project are good," Dr Davidson said. "At the time of writing, all seven animals are looking healthy and moving about the property in a way we expect koalas to do. However, the more important indicators will be reproduction and the koalas' long-term health, welfare and survival. We will be really excited when we see their genes showing up in new joeys in years to come!

"There are several other organisations doing translocation projects – UQ and Endeavour Veterinary Ecology are conducting projects. We support their approaches because it needs more than one positive outcome to prove a rule. We need a multi-faceted approach to koala protection and conservation, and it's wonderful that we can be part of that."



Above: Meeka looks back at his QKS carer Leann Holms from his soft-release enclosure on Hidden Vale. Photo by Tina Legaspi.

Click or scan to watch Meeka's Soft Release Video



Click or scan to hear Meeka's bellow



#### FURTHER INFORMATION Click or scan to open link

Queensland Koala Society queenslandkoalasociety.org



RSPCA Brisbane www.rspcaqld.org.au/locations/ brisbane



Moggill Koala Rehabilitation Centre environment.des.qld.gov.au/wildlife/ animals/living-with/koalas/care-andrescue/moggill-hospital





## RESEARCHER PROFILE: ABBY DENNIEN

Assistant Senior Keeper at HVWC, and USQ Honours student

### USING THE MATA HARI JUDAS TECHNIQUE TO ATTRACT FERAL CATS

Feral cats pose a significant threat to our native species. Unfortunately, they are also difficult to manage, and current techniques have limitations. My Honours project focused on trialling a new feral cat management method, called the Mata Hari Judas Technique.

It was first developed in the early 2000s to remove remnant feral goats. The general method involves inducing prolonged oestrus (sexual receptivity) in a female as a way of revealing the location of other members of her species.

The first step in employing this technique with cats was determining if the queens (adult female cats) could be induced into prolonged oestrus and were attractive to males, which proved successful. The next step was trialling it in situ to see if the concept would work; this was the overarching aim of my research.

The research was carried out across three of the Turner Family Foundation properties: Hidden Vale, Thornton View and Peak Station. The Mata Hari Judas queens were housed in large selfcontained enclosures, called vennels, with traps affixed to capture attracted cats. Two vennels were deployed at each property, one housed a Mata Hari Judas queen (queens vennel) and the other with just the auditory and olfactory lures from a Mata Hari Judas queen (faux queen vennel).

The results of the research showed that the technique can work. Six cats were attracted to the vennels, with two male cats captured and fitted with a GPS collar. Many of the cats made repeated visits to the vennels.

We determined that the cats were attracted to the queen or her lures, not just passing through by chance. There was a significant difference in the attractiveness of the two vennel types. The cats visited more often and spent far more time at the queens vennel. In fact, they spent nearly 10 hours in total at the queens vennel.

This research is the first instance where Mata Hari Judas queens have been successfully used in situ to attract and capture feral cats. It is an exciting development for feral cat management. With further refinement and development, the use of Mata Hari Judas queens could provide an efficient technique for removing remnant cats and, in turn, have significant impacts on feral cat management, and the conservation of our native species.

## IT IS AN EXCITING DEVELOPMENT FOR FERAL CAT MANAGEMENT.



# **RESEARCH SNAPSHOT**

Hidden Vale Research Station encompasses 4,500 hectares, of which 3,100 hectares is a network of Nature Refuges in the Little Liverpool Range region including Hidden Vale, Peak Station and Mount Mistake/Thornton View.

Access to these extensive natural habitats provides unique teaching and research opportunities.

Here's a snapshot of just some of the current ecological monitoring projects at **Peak Station:** 



Image: Stunning landscape at Peak Station provides habitat for a diverse range of native animal species. (Photo by Kellie Schuring)

### 1. Small mammal surveys, and safe havens

- Long-term ecological monitoring at Peak Station is supported by seasonal small mammal surveys which have revealed a high diversity and abundance of native mammal species, including 11 ground-dwelling 'critical weight range' mammal species (weighing between 35–5,500 grams that are impacted by feral predators) such as the threatened long-nosed potoroo, rufous bettongs, bandicoots, and a suite of native rodents.
- Six survey transects within one site on the property encompass open woodland, closed woodland, and riparian zone, with variable terrain.
- Two semi-permeable safe haven enclosures have recently been established within the site, which will provide refuge

opportunities for critical weight range mammals such as rufous bettongs, long-nosed potoroos, bandicoot species, and other ground-dwelling natives.



Image: A pouch check on this northern brown bandicoot, trapped during small mammal surveys, revealed three pinky joeys. (Photo by Kellie Schuring)

### 2. Healthy populations

- Information collected during small mammal trapping contributes to establishing population trends. Animal weight, sex, and other morphometric measurements are recorded for each animal that is caught.
- Pouch checks conducted on all female bandicoots captured during recent trapping efforts revealed many with pouch young, suggesting they are breeding successfully within this landscape.



Image: To facilitate population data at Peak Station, field biologist Tina Velasquez Legaspi microchips a northern brown bandicoot captured during small mammal surveying at Peak Station. (Photo by Megan Brady)

#### 3. Capture and re-capture

 Species population and abundance data relies in part upon the ability to capture, then re-capture individuals. Animals such as bandicoots, rufous bettongs and long-nosed potoroos can be microchipped during targeted small mammal trapping surveys to establish long-term data sets that inform population trends within a survey site at Peak Station.

 Using this data, Turner Family Foundation ecologists have been building a 'big picture' of how these animals are moving throughout the landscape, using the habitat and resources, and persisting over time.



Image: A fox fitted with a GPS-equipped radio-tracking collar is caught on one of many trail cameras located on Peak Station to record species presence.

### 4. Predators in the landscape

- Surveys have revealed multiple introduced predators, such as foxes and cats, as well as wild dogs all coexisting and overlapping in range at Peak Station.
- Targeted trapping of foxes, and feral cats has facilitated the fitting of GPS-equipped radio-tracking collars, which is now facilitating data collection on animal movements, providing insights into home range use, and potential overlap with other individuals.
- Other methods currently used for monitoring predator presence include the collection of scats, with content analyses undertaken to inform diet. Previous samples have contained a wide range of species including wallaby species, bandicoots, and various rodent species.

## NESTBOXES FOR HOLLOW - DEPENDENT MAMMALS AND BIRDS

Written by Diana Fisher (UQ) and Georgie Braun (QTFN)



- They can increase local populations of some species by adding shelter and breeding sites if these are in short supply – for example in degraded, regrowing or burned forests that lack trees old enough to contain sufficient suitable hollows for arboreal mammals and hollow-nesting birds.
- 2) They provide a method to survey species' presence and study population processes, such as breeding success of some small, arboreal species that are cryptic and not otherwise readily trapped to assess breeding. Examples include pygmy possums, feathertail gliders, parrots and some bats.
- They attract some animals and can entice them to camera traps or acoustic recorders without having to use food baits.
- 4) Some types of nestboxes provide better protection for threatened species from invasive predators better than natural hollows can – for example, nestboxes designed to exclude introduced sugar gliders from Critically Endangered swift parrot nests in Tasmania.
- 5) Animals that nest in hollows tend to use many different ones and swap between trees frequently. This helps to avoid parasites building up in nesting material, and attention from predators that may notice repetitive movements. Providing boxes may also allow them to swap nest sites more often.



Above: Squirrel glider bringing her young to a nestbox at Hidden Vale Research Station.

Different animal species are likely to prefer different nestbox sizes, shapes and entrance hole designs depending on their body size, sociality, and ability to fly or climb. During the past few months, we have begun establishing nest boxes at Hidden Vale Research Station and also at Queensland Trust for Nature's Aroona property. This project is funded by a WIRES National Grant Program.

Our aim is to find out what characteristics of artificial hollows most benefit particular mammal and bird species.

Each nestbox is monitored using a camera trap. We are also testing how design, height above ground, and placement of nestboxes affect occupancy and breeding success of mammals and birds, including threatened species.

We are also assessing the circumstances of competition for nestboxes between species, so we can optimise our design to give access to as many species as possible.

Together with QTFN, this project will also invite landholders and citizen scientists to monitor the nestboxes and assess camera trapping results. Based on this, we expect to recommend how to place nestboxes in the local region to maximise the number of species using them.



Above: A squirrel glider bringing nesting material to the nestbox.

Above: A female brush-tailed phascogale investigating the same nestbox as previously used by the squirrel glider.

In the next year, we will apply our findings to deploy nestboxes throughout the Hidden Vale Research Station as part of a large-scale wildlife monitoring scheme. We also aim to incorporate hollow logs and timber shelter at ground level into this research, at a later stage.

Hollow-dependent threatened species recorded in the region include the glossy black cockatoo (Vulnerable in Queensland), powerful owl (Vulnerable in Queensland), brush-tailed phascogale (Vulnerable in NSW, Near-Threatened globally), greater glider (Endangered in Queensland), and Corben's long-eared bat (Vulnerable). Threatened species likely to benefit from ground-level timber shelter include spotted-tail quolls (Vulnerable in Queensland), and long-nosed potoroos (Vulnerable). EACH NESTBOX IS MONITORED USING A CAMERA TRAP, AND WE ARE TESTING HOW DESIGN, HEIGHT Above ground and placement of nestboxes Affect occupancy and breeding success of Mammals and birds, including threatened Species.

## FAREWELL TOM

The Turner Family Foundation recently farewelled ecologist, Tom Scott. After completing his Honours degree as part of the first student cohort at Hidden Vale in 2017, Tom progressed into a volunteer position, and in 2019 he began a part-time, paid role.

A year later, Tom became the first employee of the Foundation's Ecology Graduate Employment Program, designed to provide Hidden Vale graduates with a variety of work experiences in a supportive, mentored environment, with increasing responsibility over the twoyear program.

During his ecology journey, Tom contributed to on-ground, research and survey-related projects, developing and honing a variety of skills as a valued member within the Ecology and Conservation Team. We wish him all the best as he moves on to new career challenges.

Image: Ecologist Tom Scott, with an original watercolour painting by Tracy Gordon of a field site at Peak Station, presented to him as a departing gift. (Photo by Kellie Schuring)





Above: A recent automated test survey of an area at Hidden Vale revealed 14 koalas, whereas a manual drone approach yielded only four animals a few weeks later.

Above: This photo shows a normal (not infrared) image of a koala and her joey in a tree top, discovered by a pilot using the manual search drone method.

# TREETOP TECH

TECHNOLOGICAL INNOVATION OFTEN GIVES RISE TO INTENSE COMPETITION, WHICH CAN LEAD TO RAPID ADVANCES IN CONSERVATION SCIENCE. UNMANNED AERIAL VEHICLES, OR DRONES, ARE THE MOST RECENT EXAMPLE.

Counting wildlife is a crucial step in saving any species. Without accurate counts, it becomes a laboursome task to measure the success of interventions or changes in the environment.

Counting koalas is no exception. While traditional ground counts by human spotters, dog detections and other manual scientific methods have improved our understanding of their plight, there are still no definitive, long-term assessments of the number of koalas in complex wilderness landscapes. The most recent national koala estimates (2012) are based on expert knowledge, and they vary widely<sup>1</sup>.

Enter the autonomous flying and hovering drone – a gamechanger capable of doing something only humans have previously been capable of. Drones with sensors attached can make observations that previously were done from the ground.

Accuracy is much improved. The phenomenon of observer bias, and the variability of human skill is largely removed. An autonomous drone will fly precisely where it is sent, at the height and speed it is programmed to fly, and its data collection can be digitally impartial<sup>2</sup>.

When drones fly a thermal camera over a forest to detect the body heat signatures of koalas in the tree canopy, they are reportedly 86 per cent precise<sup>3</sup>. That is a considerable improvement over human detections using ground-based methods. Predictably, there is some debate about the best way to conduct this aerial analysis. Two distinct approaches are emerging: the human drone pilot and observer approach, and the autonomous drone and machine-based detection and counting.

We have trialled both approaches at Hidden Vale. Encouragingly, both methods have detected numerous koala heat signatures. Previously, our own experts estimated between 12 and 15 koalas in an area. The piloted drone found and confirmed 19 in our test area. We weren't far off, but it is good to see that the actual number is higher. The value to our research is the repeatability of the assessments. We plan to conduct a fully-automated survey in early winter 2023.

As the two methods face off, it is likely that both have value in conservation. There is no replacement for the human eye and its ability to interpret an image, so the use case for human pilots is well supported in situations where individual animals need to be located or assessments of their health and welfare are required. As a rapid, onsite estimator of the presence, distribution and density of koala populations, the human pilot holds its own. An automated approach offers less variability for longer-term data needs, such as developing multi-year population trends. Automation, therefore, appears to offer benefits in managing conservation efforts, population status and for achieving more consistent, higher detection rates independent of changes in pilots' flying skills or observational ability.

Far from being a duel for the best method, it is more a case of the right tool for the job. From any perspective, dronebased monitoring is providing a new and exciting platform in the conservationist's armoury.

- 1 https://onlinelibrary.wiley.com/doi/pdf/10.1111/ddi.12400
- 2 Witt et al. (2020) Real-time drone derived thermal imagery outperforms traditional survey methods for an arboreal forest mammal. PLoS ONE
- 15(11): e0242204. https://doi.org/10.1371/journal.pone.0242204 3 Corcoran et al. 2019. Automated detection of koalas using low-level aerial
- surveillance and machine learning. Scientific Reports. 9:3208



Compare and contrast the new river sand (top of image) to the old beach sand (bottom of

THERE'S NO

PLACE LIKE

HOME!

Female bilby, Violet, exploring the new log den in the Hidden Vale Wildlife Centre bilby enclosure.

We replace the sand in our bilby enclosures about every six months to keep things fresh and exciting for some of our favourite residents at the Hidden Vale Wildlife Centre.

sand.

Recently, we added a new type of sand more suited to bilby digging behaviour. The old sand was a much finer, soft white beach sand, while the new sand is a more compact and coarse river sand. The bilbies are loving it!

We sincerely thank all of our volunteers, staff and colleagues, along with Mark Phelps and his team, and Cam from Hidden Vale Adventure Park, who got on the tools for a day's hard yakka to move nine cubic metres of sand out, and another nine back in by sundown!

If you would like to support our work, scan or click the QR code to 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.



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