

Kinder® Natoons sponsorship to save endangered native wildlife

In 2019, the Australian Wildlife Society accepted a significant sponsorship from family-owned confectionery brand, Ferrero as part of their new Kinder Natoons range which aims to help save endangered wildlife across Australia and New Zealand. Kinder's Natoons collection features a native Australasian animal toy range to provide parents with the tools to educate their children about the importance of native wildlife. The Society has selected several wildlife conservation programs in each state of Australia and one in New Zealand as recipients of conservation funding under this program.



Wildlife Conservation Projects We Have Supported

Raising Awareness of the Plight of Koalas by Educating Children

Julie Reid

Friends of the Koala (FOK) is a not-for-profit organisation in the Northern Rivers region of New South Wales. We are licensed by the New South Wales Department of Planning, Industry and Environment to rescue, rehabilitate and release koalas (*Phascolarctos cinereus*) in the region. Each year we rescue up to 400 sick, injured and orphaned koalas – more than any other rescue organisation in New South Wales. Amongst many other activities, we maintain a 24/7 rescue hotline, operate a native tree nursery, and manage both a triage, treatment and pathology clinic and an education and administration centre in East Lismore. Our mission is to make a key contribution to Australia's biodiversity, by ensuring the conservation of the iconic koala and the preservation and enhancement of koala habitat, particularly in the Northern Rivers region.

Koala conservation cannot be achieved without the inclusion of Australia's future generations and the ongoing education of children and young adults. By teaching environmental awareness and wildlife conservation, children are more likely to become engaged with their local communities later in life, and be more conscious of threats to sustainability. Younger generations play a key role in conveying the important message of koala conservation to others, including their friends and family. Such messages include koala preservation, the need for protection of habitats, and the ongoing threats to wildlife.

FOK educators are regularly called on to attend school environmental education events and to visit local schools to



Lismore City Council 'Upcycle' family education day - looking for koala (*Phascolarctos cinereus*) scratch marks.



World Environment Day, combined schools' event - Wyrallah Road Public School students.



Rocky Creek Dam Environmental Family Education Day.



Lismore High School Education Day.

communicate with students, reaching more than 300 students on an annual basis. What FOK educators are finding in their regular contact with children, is the high level of knowledge amongst local students relating to Australia's native wildlife and, in particular, koalas. Most students have had contact with Australia's endearing icon or can have their first encounter at one of the many combined school events, held in koala habitat at the Lismore City Council's Botanical Gardens education site. We are always fortunate to have a koala in attendance; however, the challenge is to locate it.

Students are provided with the opportunity to put on their detective hats; they are guided in what signs to look for when koalas are known to be present (e.g. scats and scratch marks on trees). While children are initially excited by the sight of a koala, whether in a tree or on the ground, they are also learning to determine if the koala is in distress or unhealthy. Furthermore, they are taught how to report an injured koala, and whether it requires FOK's assistance.

The New South Wales Environmental Trust funded 'Koala Watch' project has generated an education resource package that is suitable for all members of the community. The success of this ongoing education, across all sectors of the community, has led to an escalation



School Education Program - Eltham Public School.

in the reporting of koala sightings and an increase in the number of koalas coming into care. As part of the 'Koala Watch' project, students are issued with

a fridge magnet with the FOK rescue number. Students of all ages can also access activity sheets on the FOK website <https://www.friendsofthekoala.org/>.

Key outcome and impact of the funding provided: in 2019, Friends of the Koala (FOK) engaged with students and members of the community at a number of events such as Lismore City Council 'Upcycle' family education day, Eltham Public School Education Program and Rocky Creek Dam Environmental Family Education Day, to educate students and members of the community about the importance of koala conservation. Students and members of the community were taught what signs to look for when koalas are known to be present (e.g. scats and scratch marks on trees), to determine if a koala is in distress or unhealthy, how to report an injured koala, and if it requires FOK's assistance. FOK successfully educated more than 300 students and members of the community about the importance of koala conservation.

Save Australia's Wonderful Wombats: A Wombats SA Education Project

Sally Letcher

Wombats SA aims to promote and raise public awareness of the value of conserving Australia's native flora and fauna through the maintenance and re-establishment of natural ecosystems and wiser land use. Currently, our main objectives are the management, maintenance and restoration of Moorunde Wildlife Reserve, which is the first established and currently largest sanctuary for the southern hairy-nosed wombat (*Lasiorhinus latifrons*) in the Murraylands Mallee, and one reserve near the town of Robe, southeast of Adelaide.

In recent years, southern hairy-nosed wombats in the Murraylands have faced many threats. The last couple of years have been very difficult,

largely due to overgrazing pressures on the land and weather conditions, which have meant their native grasses haven't come back since the end of the last drought in 2012. In addition to the resulting malnutrition and starvation, many local farmers and landholders view wombats as vermin to be destroyed. We have seen disturbing evidence of wombats that have been culled both legally and illegally by shooting or bulldozing warrens over vast areas, leaving the wombats trapped to die slow deaths. Wombats SA, together with other groups, individuals and researchers, under the name Wombats Alliance, is working towards a long-term and region-wide solution to the overgrazing situation.



Wombats SA has been developing resources to promote greater public awareness of the endangered southern hairy-nosed wombat. A website has been developed, which contains student resources, as well as comprehensive teacher notes, units of work, and enquiry activities for students from foundation through to year six. These



Southern hairy-nosed wombat (*Lasiorhinus latifrons*) at Moorunde Reserve. Photo: Karen Collins

units align with both the Australian Curriculum and International Baccalaureate frameworks. Through the study of a species, such as the southern hairy-nosed wombat, students will be encouraged to see the relevance of their classroom studies to the complex environmental issues confronting the country they live in. We hope that these resources will assist teachers in equipping their students with the skills they need to be creative problem solvers

and powerful advocates, to contribute to a healthy environment that supports all those who depend upon it.

In the next few months, we will also be conducting and filming several interviews with experts and volunteers. These interviews will help bring conservation and science to life in classrooms by providing students with the opportunity to hear from, and potentially interact with, people in the field.

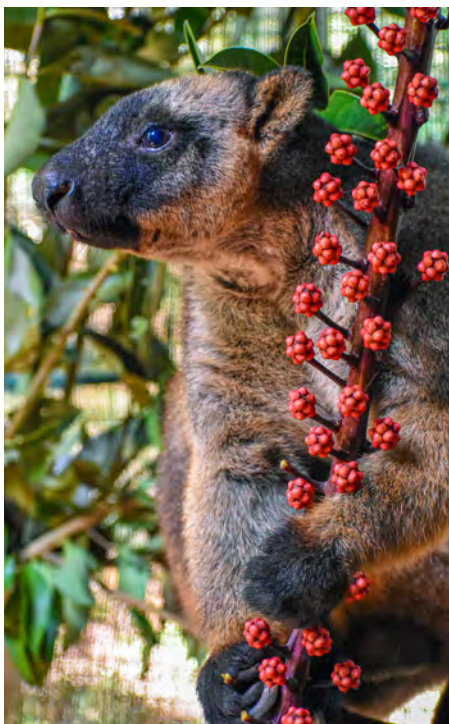
While these resources are focused on the southern hairy-nosed wombat, they can easily be adapted to suit wombats in other regions. If you know a school, teacher or organisation who may wish to use them, we welcome you to share the following link with them <https://www.saveourwonderfulwombats.org.au>

Key outcome and impact of the funding provided:

Wombats SA developed education resources to promote greater public awareness of the endangered southern hairy-nosed wombat. A website containing student resources was developed, which also provides comprehensive teacher notes, units of work, and enquiry activities for students from foundation through to year six. These units align with both the Australian Curriculum and International Baccalaureate frameworks. Through the study of a species, such as the southern hairy-nosed wombat, students were encouraged to see the relevance of their classroom studies to the complex environmental issues confronting the country they live in. These resources also assist teachers in equipping their students with the skills they need to be creative problem solvers and powerful advocates for a healthy environment that supports all those who depend upon it.

Tree Roo Rescue and Conservation Centre: A Very Special Australian Animal is in Trouble

Dr Karen Coombes



Mickie, a blind adult male Lumholtz's tree-kangaroo with his favourite umbrella flower (*Schefflera actinophylla*).

Did you know that kangaroos can climb trees? In 1872, William Hann stated, "to entertain the idea that any kangaroo known to us, or approaching its formation, could climb a tree, would be ridiculous". An individual might think that a kangaroo is incapable of climbing a tree; however, there is indeed a very special kangaroo that can climb a tree – a tree kangaroo.

There are 14 species of tree kangaroos. 12 species are found in Papua New Guinea and Australia has two very unique and endemic species – the Lumholtz's tree-kangaroo (*Dendrolagus lumholtzi*) and Bennett's tree-kangaroo (*Dendrolagus bennettianus*). Both species are found only in Far North Queensland and nowhere else in the world. While Bennett's is found north of the Daintree River, Lumholtz's distribution is from the Cardwell Ranges to the Daintree region, although it is found mostly in a fragmented rainforest on the Atherton Tablelands.

Many Australians don't even know these amazing animals exist, let alone that we have two very unique endemic species here in Australia.

The Lumholtz's faces several threats from habitat loss to dog attacks and vehicle strikes. In the past eight years, a new danger to their survival has emerged. An alarming number of Lumholtz's have been presenting with neurological or central blindness, with an increase of animals coming into care every year. Last year was the worst year, with one blind tree-kangaroo rescue being completed per week from August 2019 through to January 2020.

Tree Roo Rescue and Conservation Centre Ltd (TRRACC) is a non-profit organisation that is committed to rescuing and rehabilitating orphaned, injured or displaced Australian tree-kangaroos and returning them to the wild. However, if a tree-kangaroo is blind, returning it to the wild is not

possible. Fortunately, many can be rehomed at accredited zoos, which will play an important role in education and conservation. TRRACC works closely with the Queensland Department of Environment and Science (DES) and the Zoo and Aquarium Association (ZAA). Together, we have developed a captive breeding program and train zookeepers in the husbandry of Lumholtz's tree-kangaroos. TRRACC's vision is to assist in the prevention of the extinction of Australian tree-kangaroos, help to educate the public and increase awareness of Australian tree-kangaroo conservation and the threats that bring them into care. TRRACC is the very first and only dedicated tree-kangaroo rescue and rehabilitation centre in Australia and probably the world.

My husband and I moved to the Atherton Tablelands twenty years ago, with ten years of wildlife caring experience. We could not believe so little was known of this charismatic species. I embarked on, and completed, a PhD on the ecology and habitat use by Lumholtz's tree-kangaroos in 2005. We began rescuing injured and orphaned individuals from the time we arrived and have continued ever since. TRRACC was founded and established in 2012 due to the increase in rescues coming in. Until then, all costs were coming out of our own pockets, with no government funding available to wildlife carers. TRRACC still relies heavily on donations.

To have a large increase in individuals being rescued due to blindness is a huge concern for the future of this special and unique animal. While the affected tree-kangaroos are not completely blind, they suffer from loss of focus and poor depth perception. They can sense movement, light and shade and can see enough to get into trouble. Their actual eyes are not damaged, and they can look fine and healthy otherwise. They can still hop fast across the ground and climb around in trees but are not as agile as other animals. They become disoriented and lost and turn up in unusual places such as the plumbing section of a hardware store in the centre of Malanda, a noisy workshop of a service station and a toilet block in a café in Yungaburra. If the eyes are damaged, I believe it is due to the tree-kangaroo running into something due to the lack of focus and there is secondary damage to the eye. It is not toxoplasmosis or herbicide exposure and it is not contagious or hereditary. Joeys born from blind parents are not blind, and pouch young that come into care from mums being killed are not blind – only bigger teenagers, adults and older tree-kangaroos are affected.

We believe that the drier and warmer weather, experienced by the Atherton Tablelands over the past eight years, has played a major role in the increased stress to the rainforest fragments in which Lumholtz's tree-kangaroos live. Warmer weather increases the toxins in the rainforest leaves that the tree-kangaroos eat. Rainforest on the tablelands was continuous until it was cleared for timber and farming and is now highly fragmented, which allows the forest to dry out more than it would have in the past. The rainforest leaves are already very toxic, and the stress from drying out would increase these toxins. Whether these toxins are causing the damage, or the stress is allowing something else such as a pathogen to cause it, is yet to be determined.

Although research is ongoing, we do know that these rescued tree-kangaroos have brain damage and optic nerve damage behind the eye. Tissue samples, taken from affected animals, have been examined by veterinarian pathologist Dr Andrew Peters, a senior lecturer in Wildlife Health and Pathology at Charles Sturt University. Andrew believes that some evidence suggests this may be a new viral infection, potentially even a



Newly completed tree-kangaroo enclosures at Tree Roo Rescue and Conservation Centre Ltd.



Dr Karen Coombes with Jilly, a hand-raised orphaned Lumholtz's tree-kangaroo. Jilly is not blind and will be released once old enough.

new virus, and that a lot of wildlife diseases, particularly new viral infections, are caused by changes to the environment.

TRRACC also works closely with Dr Tony Read, a veterinarian ophthalmologist from Adelaide. We have been working with Tony for the past eight years. He donates his time to check all blind Lumholtz's tree-kangaroos that come into care and to assist in the investigation of their blindness. We will be continuing our research this year, along with a veterinarian neurologist and a veterinarian neuropathologist who are joining the team, to help determine if the damage is from a virus or toxins.

Key outcome and impact of the funding provided: Tree Roo Rescue and Conservation Centre (TRRACC) was able to make improvements to their tree-kangaroo facilities such as tree-kangaroo enclosures, further develop their research into the cause of blindness in tree-kangaroos and created educational material for schools and the general public to help educate and increase awareness of Australian tree-kangaroo conservation and the threats that bring them into care.

Increasing Awareness of Platypus Conservation Issues in Victorian Primary School Students

Josh Griffiths



Josh Griffiths with Neerim South Primary School students. Josh is teaching the students about the importance of platypus conservation.

The platypus (*Ornithorhynchus anatinus*) is one of the most unique animals in the world. After all, it is a duck-billed, beaver-tailed, semi-aquatic, venomous, egg-laying mammal. Platypuses live in freshwater rivers, creeks, lakes and dams throughout eastern Australia. As an

aquatic species, the water that they rely on is also used in our houses, farms and industry, placing serious stress on their habitat. Other threats to platypus populations include drought and climate change, clearing vegetation, pollution, fragmentation from dams and weirs, and entanglement in litter and fishing equipment. As a result, we have seen declining populations and localised extinctions over the past few decades.

One of the challenges as a researcher is to be able to share our findings and knowledge with the wider community, to help instil the wonder of Australia's amazing native animals and to hopefully change behaviours that will result in better conservation outcomes for wildlife.

Thanks to a grant provided by the Australian Wildlife Society, leading platypus ecologist, Josh Griffiths from Cesar, is sharing more than a decade of experience and knowledge of platypuses with primary school students across regional Victoria. Primary school students, particularly those in the seven to ten age group,

are an ideal target audience with their natural curiosity and tendency to ask the most interesting questions without reservation. Josh Griffiths also designed some educational material (e.g. stickers, a poster and a brochure) to leave with the students, featuring key messages and amazing photos by Doug Gimesy. Importantly, they are then able to share the information they learn with their family and friends, thus increasing the reach of the message of the importance of platypus conservation.

Students learn about the unique features of the platypus, how it is so well adapted to its environment, some of its habitat preferences, and the threats it faces. Importantly, students learn what they can do to help. There are three take-home messages that we can all apply to help platypuses:

1. use less water – every litre of water we save can go back into the environment for platypuses and other aquatic species;
2. pick up rubbish and snip through any enclosed loops before throwing them away – platypuses are very good at getting entangled in things like rubber bands, hair ties, and plastic rings; and
3. fish responsibly – take any discarded line with you, retrieve snagged lines, and do not use opera house nets for yabbies (now illegal in many areas).

Additionally, everyone can also help researchers learn more about platypuses by recording any sightings on the platypusSPOT website or app <https://platypusspot.org/>.



Platypus education poster.

Key outcome and impact of the funding provided:

Platypus expert, Josh Griffiths, was able to successfully educate groups of students at a range of local Victorian schools about the importance of platypus conservation. Josh Griffiths covered a range of topics including: 1. What makes the platypus so interesting and unique; 2. The threats the platypus faces and why; and, 3. What we can do to help ensure the platypus continues to survive and flourish. Through our donation, Josh was able to educate more than 120 students in 2019.

Platypus Education Group: Junior Ambassador Program

Jen Ellison

Young people are naturally curious and protective of animals, especially weird, cute and unusual creatures like the platypus. This is why we launched the Platypus Education Group in 2015. Our initial idea was to run free lessons in schools in the Yarra Ranges region of Victoria. We wanted to educate, engage and excite children about the platypus that live in their local creeks and rivers. For two years, we visited every primary school in the region, as well as several kindergartens and high schools. We spoke to hundreds of students, and realised, through a mixture of discussions, games and activities, all the young people were eager to learn about this bizarre egg-laying, venomous mammal.

In 2017, following the success of our school lessons, we launched a Junior Ambassador program for children who wanted to learn more and do more to protect their local environment. The Junior Ambassador program consists of a group of children, between eight and twelve years of age, who meet every month throughout the year. We complete a mixture of activities, from practical hands-on conservation work to learning about native wildlife and ways to live sustainably. We



Two Platypus Education Group ambassadors at the Belgrave Platypus Festival. Photo: Doug Gimesy

have worked with more than 50 ambassadors over the years, and together they have collected over 5,000 items of litter, planted more than 1,000 native trees, and built and sold numerous nest boxes for possums, sugar gliders (*Petaurus breviceps*)

and microbats. We have also had guest speakers teach children about wombats, lyrebirds, indigenous history and so much more. Furthermore, all ambassadors are encouraged to help us at festivals and events, so they can help educate the community and, hopefully, inspire others to do their bit for the planet. We hope that we are creating future environmental stewards who will conserve and protect Australia's natural environment.

Our group was part of the Victorian Alliance for Platypus-Safe Yabby Traps. When our ambassadors learnt about the numerous amounts of platypuses tragically drowning in opera house nets, they were desperate to take action. The ambassadors wrote letters and drew pictures that were sent to the Victorian State Environment Minister, as well as our local member of parliament, James Merlino, who is also the Deputy Premier of Victoria. We met with Mr Merlino several times, and the children were provided with the opportunity to speak about conservation issues regarding these dangerous nets. We were very honoured to work alongside other alliance members and were thrilled when the ban on opera house nets was implemented throughout Victoria in July 2019. Mr Merlino joined us for our



Making nest boxes at Belgrave Men's Shed. Photo: Jen Ellison

celebratory party, and he informed the ambassadors that they played a key role in the outcome of the decision. Mr Merlino spoke about the importance of young people having a voice and not being afraid to use it – something we also highly encourage.

As a result of the ambassadors implementing wildlife conservation action, they were awarded the Ken Macintosh Memorial Award for Young Environmental Achievers, at the 2019 Yarra Ranges Council Australia Day Awards. We were incredibly proud to watch a number of the children speak at the ceremony about their passion for protecting wildlife and how they hoped that everyone would take action to look after the planet.

We are an entirely volunteer-run group, and therefore we rely on grants and fundraisers to help cover our costs. Our main project for this year is to work with Brooke Wandin,

a Wurundjeri educator. Brooke will share stories and Woiwurrung language with students to help deepen their understanding of the environment, culture and place. She will also focus on the creation story of the platypus, and how this relates to the other work being implemented by the ambassadors.

At the completion of the Junior Ambassador program, the ambassadors will produce a book, available at no cost, which will detail everything that they have learnt as part of the project. The book will help to educate individuals, schools and communities on what they can do to help protect the platypus and maintain healthy creeks and waterways.

The program will run alongside other activities such as a revegetation planting day along Monbulk Creek in Belgrave Heights, working with a local wildlife carer to support their

important tasks, and learning about other native wildlife. We are very excited about the Junior Ambassador program as we believe this knowledge is a wonderful way for young people to connect to their local environment, and to inspire others to want to help native Australian wildlife.

Key outcome and impact of the funding provided: Platypus Education Group (PEG) successfully educated many children in the Yarra Ranges region of Victoria about the platypus that live in their local creeks. PEG established the Junior Ambassador program, which consists of a group of children, between eight and twelve years of age, who met every month throughout the year. They completed a mixture of activities, from practical hands-on conservation work to learning about native wildlife and ways to live sustainably.

Virtual Classroom to Assist in Tasmanian Devil Education

Darren Rumble



Tasmanian devil joeys during an interactive tour.

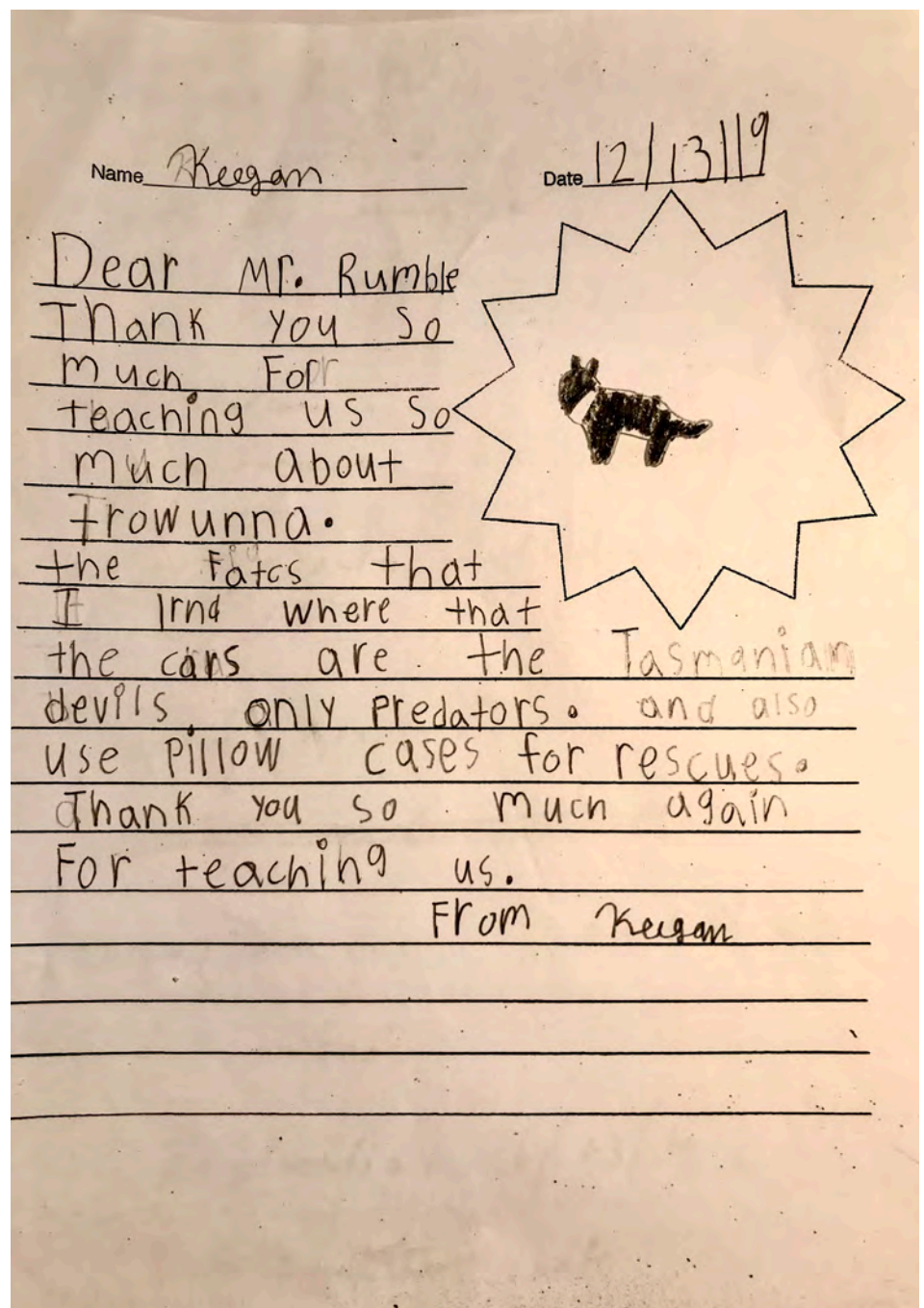
The Tasmanian devil (*Sarcophilus harrisii*) is one of the most misunderstood native animals of Australia. They have earned themselves a reputation as being fierce and savage animals. From the time of early European settlement in Tasmania, they have been vilified and persecuted with a bounty after mislaid claims of livestock predation. The name devil originates from the early settlers who would hear the devil's shrieking vocalisations reaching out from the darkness, raising the hairs on the necks of even the staunchest of listeners. Adding to this reputation, was the fact that if you saw a devil as evening fell you would see the eerie glow of two red horns emanating from the head of a dark silhouette. The morning would only strengthen the devil's persona, as the nightly actives were revealed with a victim picked clean of flesh and everything but the largest of bones.

Today, we recognise these traits in a very different light. The vocalisations form an important

part of the devil's social dynamics and are essential for establishing hierarchy in social feeding situations. Although primarily a solitary animal, the devil is known to be a social feeder, with groups gathering on the discovery of a large carcass. A cohort of devils is far more efficient than an individual, for the important task of cleaning the landscape of carrion and its potential to harbour disease. What was once thought to be glowing horns are recognised now as one of the devil's many adaptations to its environment and plays an important part in heat dissipation. The devil's ears are only lightly covered with hair and their thin membranes allow for the regulation of body temperature, thus appearing red in certain light conditions.

The interpretation and repair of the devil's reputation has been the life's work of Trowunna's managing director Androo Kelly. Since its inception, Trowunna, under Androo's guidance, has been at the forefront of Tasmanian devil conservation, research and education, a three-tiered approach. The education component of this three-tiered approach has always been viewed as crucial to having the devil recognised for the incredible and unique animal it is. Trowunna has always seen its visitors as the conduit for delivering a message that would evoke a much deeper understanding and appreciation of the Tasmanian devil and wildlife in general. Androo wanted to ensure that having an experience with a Tasmanian devil was within everyone's reach, especially children. After engaging in conversations with both primary and secondary schools in Tasmania, it was discovered that many schools were struggling to meet the costs of excursions, with the transport costs being the most significant factor.

From these discussions, the concept of a virtual classroom was born. The idea was to create a short video about the Tasmanian devil – its lifecycle, the Tasmanian devil facial tumour disease and its impacts, and how the public can help to conserve the devil. The video would enable teachers to engage with students on a preliminary level and establish a knowledge base about the Tasmanian devil. Schools that couldn't afford an excursion to Trowunna could



Thank you letter from the pilot session of the virtual classroom.

have their learning outcomes supported with a virtual classroom lesson conducted over Skype. The virtual classroom lesson would have all of the features of an interactive tour, other than the tactile component.

The video for the virtual classroom will start production soon, with the final layout and schedule to

be finalised in the coming weeks. The virtual classroom has been successfully trialled with a primary school in Florida in the United States of America, who enjoyed their lesson immensely. Although, the students were slightly distracted by two of our Tasmanian devil joeys who featured prominently in the lesson.

Key outcome and impact of the funding provided: Trowunna Wildlife Sanctuary established a virtual classroom to assist in Tasmanian Devil education. The virtual classroom was successful in educating a number of students about the Tasmanian devil, its lifecycle, the Tasmanian devil facial tumour disease and its impacts, and how the public can help to conserve the devil. The virtual classroom also enabled teachers to engage with students on a preliminary level, and establish a knowledge base about the Tasmanian devil and the importance of Tasmanian devil conservation.

Kaarakin Black Cockatoo Conservation Centre's Education Program

Sam Clarke and Anne Hart



A 'Cockatoo Club' member meeting Squark, our friendly resident red-tailed black cockatoo (*Calyptorhynchus banksii*).

Kaarakin is a not-for-profit wildlife conservation organisation located on a 41-acre bushland site in Martin, Western Australia. We specialise in the rescue, rehabilitation and release of all three endemic black cockatoos found in Western Australia's southwest. These are the endangered Carnaby's black cockatoo (*Calyptorhynchus latirostris*), Baudin's black cockatoo (*Calyptorhynchus baudinii*) and the threatened forest red-tailed black cockatoo (*Calyptorhynchus banksia*). As part of our mission, Kaarakin strives to engage with and educate Australia's future generations to become active conservationists and support us in our mission to save Australia's iconic black cockatoos.

Kaarakin provides a broad range of interactive and educative events to promote the plight of the black cockatoos. We have launched the Kaarakin Cockatoo Club, an education program where children between the ages of eight and twelve are provided with the opportunity to visit Kaarakin, to see our rehabilitation program firsthand, and learn about black cockatoos. The program includes an educational presentation about Western Australia's endemic black cockatoo species, their threats, conservation status and what Kaarakin is doing to help conserve these species. Furthermore, the program

teaches children what they can do to help conserve the black cockatoos, and encourages them to implement conservation action. We aim to inspire the next generation to become wildlife conservationists, by providing them with the opportunity to meet and engage with some of our charismatic resident black cockatoos, in our interactive aviary. The first Kaarakin Cockatoo Club was held on the 22 February 2020 and was extremely popular. The next session will be held on 23 April 2020.

To reach the maximum number of students, Kaarakin provides educational presentations at schools. These talks can be tailored for all

ages and aligned with the current Australian curriculum and related topics. One of our non-releasable education birds can also attend, where feasible. These school visits aid us in our mission to raise awareness of the threats faced by our black cockatoos and encourage children to actively promote and engage in environmental action that will protect black cockatoos in the wild. To date, we have attended three library sessions at different venues, four community events, and have conducted two school visits. Plans are already underway to conduct more sessions within several different schools and organisations. If your school or organisation would like to visit Kaarakin or if you would like our education officer to present at your school, please enquire at education@kaarakin.com.

Key outcome and impact of the funding provided:

Kaarakin's Education Program, Kaarakin Cockatoo Club, is an education program where children between the ages of eight and twelve are provided with the opportunity to visit Kaarakin, to see their rehabilitation program firsthand, and learn about black cockatoos. The program educates students about Western Australia's endemic black cockatoo species – their threats, conservation status, what Kaarakin is doing to help conserve these species, and what students can do to help conserve the black cockatoos. Kaarakin was able to provide a broader range of interactive and educative tools such as PowerPoint presentations, worksheets and videos as part of the program to promote the plight of the black cockatoos.



Kaarakin's education officer giving an education presentation.

Wild Deserts: Tackling Naiveté of Reintroduced Mammals to Feral Predators in The Strzelecki Desert, Sturt National Park

Reece Pedler, Rebecca West and Richard Kingsford

Wild Deserts is an exciting project partnership between the University of New South Wales and Ecological Horizons, with ten years of base funding from the New South Wales Government Saving Our Species program (2016–2026). We aim to understand, restore and promote the wonder of desert ecosystems by reintroducing seven locally extinct mammals, using our partnerships. Our project has established two large feral predator-proof exclosures (each 2,000 hectares, total 40 kilometres of boundary fence) in Sturt National Park in the far north-west corner of New South Wales. During 2019, we achieved a wonderful milestone: the total eradication of rabbits, cats and foxes from inside the feral-proof exclosures. In 2020, we plan to reintroduce the greater bilby (*Macrotis lagotis*) to the site – the first of seven species to be reintroduced, including the crest-tailed mulgara (*Dasyurus cristicauda*), burrowing bettong (*Bettongia lesueur*), western barred bandicoot (*Perameles bougainville*), golden bandicoot (*Isodon auratus*), stick-nest rat (*Leporillus conditor*) and western quoll (*Dasyurus geoffroii*). These species, along with many others, disappeared from the area



Feral-proof fences at the Wild Deserts project in Sturt National Park exclude rabbits, cats and foxes from two exclosures totalling 4,000 hectares.

over 100 years ago following the arrival of rabbits in the 1890s, along with feral cats, foxes and over-grazing by livestock.

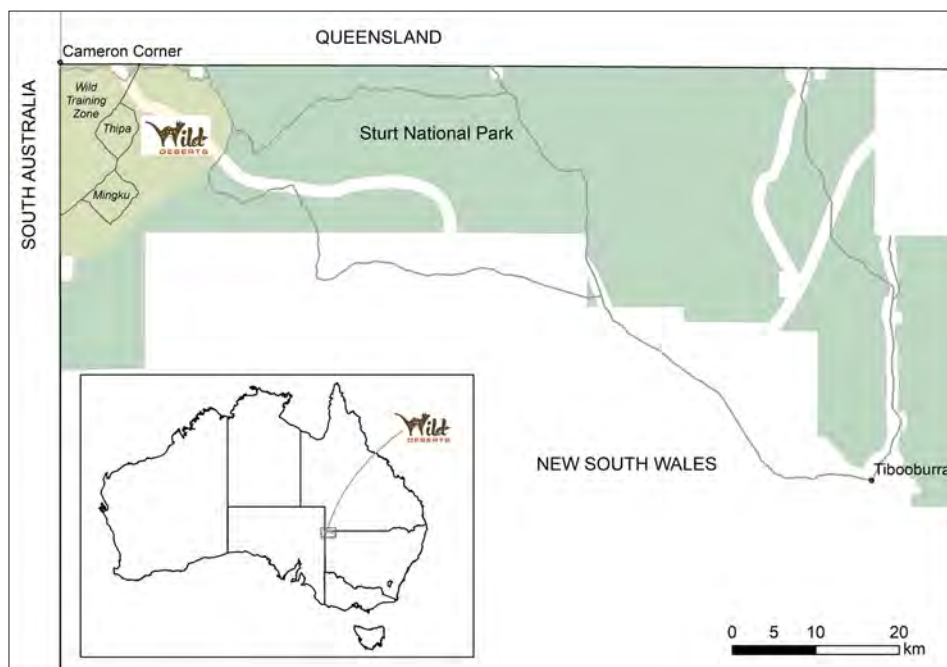
An area of cutting-edge research and management at the core of this project is our focus on one of

the long-running challenges for reintroduction in Australia – how to get locally extinct native mammals beyond predator-free fenced reserves or islands and back into the broader landscape. Returning previously established species into the landscape is not only important for the conservation of the species themselves, but also for the important ecosystem role that these species provide. For example, the digging of bilbies affects soil structure and function, nutrient cycling and mycorrhizal associations. Some of our team showed that bilbies and burrowing bettongs could co-exist with satellite-collared feral cats in a large 2,500-hectare exclosure at Arid Recovery in South Australia. Furthermore, bettongs improved their predator awareness after just two years of exposure to feral cats. Subsequent work has shown that predator-trained bilbies had improved survival compared to non-predator exposed individuals when released into areas with feral cats.

Wild Deserts is building on this proof-of-concept work by creating a Wild Training Zone of 10,400 hectares, adjacent and linked by ten kilometres of fencing to the two cat-free and fox-



The greater bilby and burrowing bettong are two of the species proposed for reintroduction and in-situ predator training at Wild Deserts, with the aim of addressing their naiveté to feral predators. Photo: Hugh McGregor, Arid Recovery



Wild Deserts is in the far north-west corner of New South Wales, with the project site and 'Wild Training Zone' bounded by the state border fence with South Australia and Queensland.

free exclosures and the Dog Fence (also the New South Wales State Border Fence). This 'half-way house' between the predator-free environment and the predator-common outside environment will allow us to release bilbies, bettongs, western quolls and other species where feral predators are tightly controlled. At the same time, we can improve awareness of the naïve native mammals about

these predators. Predator awareness is important because we will never be able to eliminate cats and foxes from most of Australia, but we can work out better ways of keeping their numbers down and numbers of native species up. Such an innovative approach will have broad application to threatened species conservation and reintroduction projects in Australia, as well as globally.

You can follow Wild Desert's progress and outcomes from the Wild Training Zone via our website <https://www.ecosystem.unsw.edu.au/research-projects/conservation-practice/reintroductions/reintroducing-locally-extinct-mammals-sturt-national-park>, and social media <https://www.facebook.com/WildDeserts/>, including volunteer field opportunities to get involved with the project onsite.

Key outcome and impact of the funding provided:

Wild Deserts is a project that aims to reintroduce locally extinct mammals to Sturt National Park in outback New South Wales. The project aims to bring back seven locally extinct mammals to the New South Wales corner country, using large feral-proof fenced exclosures and a range of innovative predator control and research techniques in Sturt National Park. Wild Deserts will use specialised netting fences to exclude feral predators and herbivores such as cats, foxes and rabbits, before reintroducing mammals that were once widespread in New South Wales but have not been seen for over a century. The mammals to be reintroduced are the western barred bandicoot, golden bandicoot, greater stick-nest rat, burrowing bettong, crest-tailed mulgara, the western quoll and, in particular, the greater bilby. The support will assist in the recovery of these mammals and help to prevent these mammals from becoming extinct on a national scale.



A predator-naïve burrowing bettong approaches a researcher conducting behavioural scoring. Bettongs exposed to low-level in-situ predation by feral cats at Arid Recovery, South Australia demonstrated significant increases in predator awareness behaviours over a two-year period. Photo: Rebecca West

The Secret Lives of Stewart Island Kiwi: A Case Study of Invasive Versus Non-Invasive Wildlife Monitoring from New Zealand

Emma Feenstra

Population monitoring to assess wildlife numbers is an essential component of wildlife research, conservation and management. Methods range in scale from least invasive (e.g. satellite images) to most invasive (e.g. surgical procedures). Invasive methods have a greater physical and/or physiological impact on individual animals, while non-invasive methods have little to none of these impacts. The distinction between invasive and non-invasive is primarily important from an animal welfare perspective but can also affect the cost, resources and experience of personnel required to monitor a population.

The methods used for monitoring wildlife populations are largely based on the species of interest, resources available, location/habitat and monitoring objectives. Less invasive methods, such as trail cameras or scat surveys, could be a lower-cost strategy in some situations but might not capture all the information required. A more invasive method, such as catching an animal and taking measurements or samples, may provide additional data but requires significant funding and qualifications. The decision is made more challenging by the fact that monitoring methods are rarely validated against known populations or alternate methods.



Acoustic recorder as part of our non-invasive survey. Mason Bay, Stewart Island.

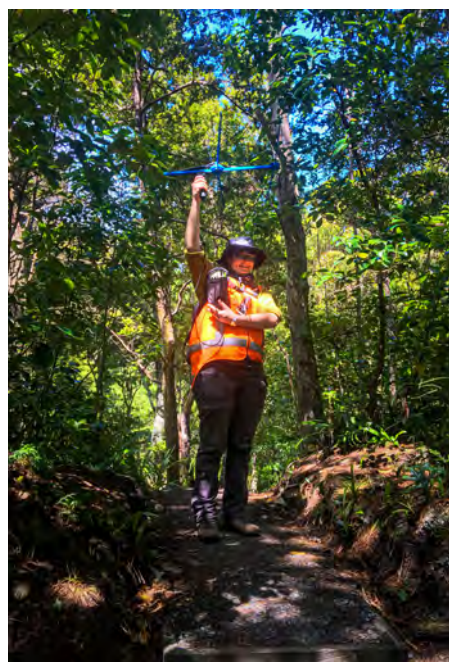
Therefore, it is common to be unsure as to how effective and efficient a monitoring method may be for a project and species of interest.

The project aims to explore and compare the effectiveness and efficiency of invasive (catching, attaching very high frequency transmitters and tracking) and non-invasive (camera trapping, acoustic recorders and scat mapping) monitoring methods using

a case study species, the Stewart Island kiwi or 'Rakiura tokoeka' (*Apteryx australis lawryi*). The Stewart Island kiwi is a flightless ratite restricted to Stewart Island. Stewart Island is an area spanning 1,746 square kilometres, situated off the south coast of New Zealand and comprised mostly of national parklands. The Stewart Island kiwi is of great conservation significance as it lacks defences



Setting up a trail camera for our bi-annual non-invasive survey. Port Adventure, Stewart Island.



French intern Orane Bitaud monitoring kiwi using very high frequency telemetry.



An adult tokoeka extracted from a burrow for a transmitter change.



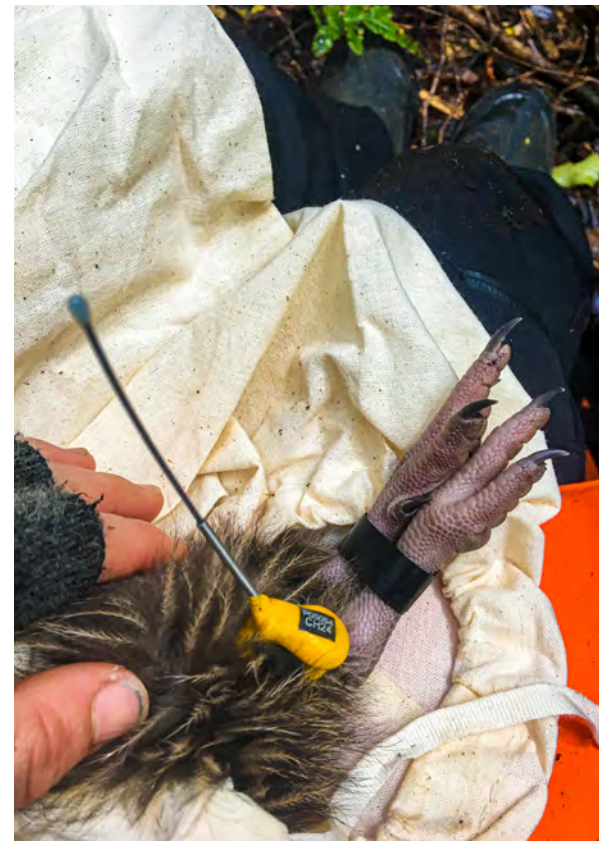
Trail camera image as part of our non-invasive survey. Kaipipi, Stewart Island.



Researcher Emma Feenstra changes the transmitter on a growing kiwi chick. Stewart Island.

against introduced mammalian predators and has been decimated by the arrival of people, habitat destruction and pests to New Zealand. The Stewart Island kiwi was selected as the study species as research on their population is limited, they are thought to be in decline, and information regarding their population status is currently a top priority for several conservation organisations in New Zealand. The comparison and validation of invasive and non-invasive monitoring will contribute valuable information on the population of the Stewart Island kiwi. Through a novel chick survival study, The Project will also determine what threats they may face and what, if any, management is required for their conservation.

There are five species of kiwi (*Apteryx* spp.), all of which can be considered 'cryptic' in the sense that they are difficult to detect. They are naturally shy, camouflaged and predominantly nocturnal. Their traits make monitoring their populations challenging; and subsequently, decisions about their conservation management problematic. Luckily, kiwi have sexually dimorphic calls that carry long distances and therefore non-invasive call surveys are a popular method for assessing their populations. Call surveys are used to measure changes in call rates, which are widely assumed to be positively related to the numbers of birds. Call surveys are simple to implement and are becoming easier to use in remote areas thanks to the growing utilisation of acoustic recording devices. However, the confidence in call surveys exists despite a lack of knowledge on the calling behaviour of individuals and populations of



The smallest very high frequency transmitter available for kiwi chicks at 5 grams.

kiwi. To make more accurate estimates of population numbers, the more invasive method of telemetry is used. This 'gold standard' of kiwi monitoring involves five-yearly surveys; catching individuals in a small area to attach specifically made very high frequency transmitters, which are then used to track birds to their locations for a short period to determine densities. Telemetry, although resource-intensive, is a particularly effective method for tracking more specific population variables such as breeding success; however, personnel must be accredited to work directly with kiwi, and the disturbance to individuals can be significant. Call survey and telemetry monitoring methods are widely used throughout the country for population estimates; however, the accuracy of these methods has not been validated against known populations or trialled in a comparison.

There are four sites on Stewart Island. At each site, invasive and non-invasive methods are being used to survey the local kiwi population. Two of the sites have been subject to historical five-yearly surveys using telemetry, and so we have reasonable estimates of density at these locations. At all sites, many birds as possible were caught within the pre-determined area. Each bird is fitted with a very high frequency transmitter and can then be monitored and tracked. The subsequent locations of these individuals, and the other kiwi they are found with, are used to develop territory maps and estimate the local density of birds, including those that were seen or heard but not caught. At two sites, the transmitters were left on the birds throughout the breeding season to monitor the survival and dispersal of their chicks and to explore the benefits of using a more invasive method of monitoring. The non-invasive surveys are completed bi-annually at the four sites using acoustic recorders and trail cameras. These are paired in a grid formation 350 to 500 metres apart, covering the study area. The distance was proven suitable to capture kiwi calls by the acoustic recorders and equates to approximately one camera per kiwi territory.

Part of this project is working on a novel method for surveying kiwi populations non-invasively using scat surveys. Kiwi scats are easy to identify and particularly pungent, making them great targets for a scat detection dog team. The project will explore whether



Rakiura tokoeka are the only kiwi species commonly active during the day.



A kiwi chick, as part of a novel chick survival study of Rakiura tokoeka. Stewart Island.

the number and density of scats to the 'known' densities, collected from the other method, will correlate. I believe that scat mapping kiwi could provide a novel method for kiwi detection and monitoring that is unbiased, useful in large and remote areas, able to detect presence and could prove cost-effective compared to other methods.

The results are still to come. Stay tuned as we uncover the secret wild lives of the Stewart Island kiwi and how our monitoring methods compare. <https://www.facebook.com/Rakiuratokoeka>

Key outcome and impact of the funding provided: The project explores the use of invasive and non-invasive monitoring methods, for a cryptic species, by comparing trail cameras, acoustic recorders and scat mapping with telemetry and tracking. By conducting population monitoring, increasing the number and diversity of sites, as well as conducting a novel chick survival study, the project will reduce information gaps, help direct the next steps for population management and contribute to saving kiwi from extinction Nationwide.