

# bushtracks

Bush Heritage Magazine | Spring 2018

## Woodland foragers

Our woodland birds face a perilous future, but we are doing all we can to help save them.

## The Goldilocks Solution

Erica Suosaari is on a mission to uncover what 'just right' looked like for stromatolites 3.7 billion years ago.

## Olkola at the helm

The re-formed Golden-shouldered Parrot National Recovery Team is providing fresh hope and optimism for the bird's future.



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*Bush Heritage acknowledges the Traditional Owners of the places in which we live, work and play. We recognise and respect the enduring relationship they have with their lands and waters, and we pay our respects to elders, past and present.*

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Tarcutta Hills Reserve,  
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Photo by Annette Ruzicka

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Almost 90 percent of Australia's temperate woodlands have been cleared. We need to protect what's left.

Since European settlement, about one-third of Australia's woodlands, and almost 90 percent of its temperate woodlands, have been permanently cleared. The inevitable result of this loss is that many of our woodland birds are in decline. In few places is this mass clearing more visible than south-eastern Australia, which is why, in 1999, Bush Heritage acted to protect Tarcutta Hills Reserve – home to one of the country's last remaining patches of White Box Woodland.

Today, Tarcutta provides a vital refuge for many woodland birds – including Swift Parrots, Superb Parrots and Black-chinned Honey-eaters – in what is otherwise a largely cleared agricultural landscape. Our cover story this issue outlines the steps Bush Heritage is taking to ensure that Tarcutta continues to provide habitat for woodland birds in decades to come.

On the other side of the country, many of our south-western reserves will likely be bursting with wildflowers by the time you read this, following good winter rains. On Charles Darwin Reserve, this year's wildflower display will provide a stunning backdrop for the Blues for the Bush music festival in late September. Further south, between the Fitzgerald River and Stirling Range national parks, the appearance of yellow and cream wildflowers around August and September

heralds the start of *Djilba*. To the Noongar people of this region, *Djilba* is a transitional time of year; traditionally, this was the time when Noongar people inland would begin their journey toward the coast in anticipation of warmer weather.

This Spring also marks the beginning of a transitional period for Bush Heritage. As I prepare to step down from my role as Chief Executive in November, I am filled not with sadness but with optimism for the future. And that's because of you. The gifts you give to Bush Heritage every day are examples of the kind of cumulative action that adds up to real change. So long as there are people like you out there, I have hope that together, we can return the bush to good health.

All my best wishes,



**Gerard O'Neill,**  
Chief Executive



# Woodland foragers

Tarcutta Hills Reserve provides vital foraging habitat for the Swift Parrot and other woodland birds, but ensuring it continues to do so in the future will require forward-planning and fast action.



← Blue-faced Honeyeater in the Tarcutta region, NSW.  
Photo by Annette Ruzicka

“I was just in awe of what I was seeing... and it’s refreshing. It gives you hope to see places like this being protected,” says Dr Debra Saunders, Swift Parrot expert and ANU researcher. Debra has just returned from surveying the 432-hectare Tarcutta Hills Reserve, in south-central NSW, for the critically endangered Swift Parrot, which migrates north from Tasmania during the winter months to forage on flowering eucalypts in south-eastern Australia.

The Grassy White Box Woodland found on Tarcutta Hills contains trees that flower consistently during these months, making them a relatively reliable source of food for the parrots. But across NSW, less than 5 percent of these woodlands remain in good condition, and many other woodland communities have suffered similar fates. Almost 90 percent of Australia’s temperate woodlands have been lost since European settlement, and about one in five woodland bird species are threatened as a result.

Walking amongst the magnificent stands of White Box, Red Box and Mugga Ironbark trees on Tarcutta Hills is like going back in time. The surrounding landscape has been largely cleared for agriculture, but by some twist of fate Tarcutta Hills was still relatively intact when Bush Heritage acquired it in 1999.

Today, the reserve is a vital refuge for many woodland birds that are disappearing from other parts of Australia: aside from Swift Parrots, it is home to Hooded Robins, Painted Honeyeaters, Superb Parrots, Brown Treecreepers, Diamond Firetails, and more.

**Today, the reserve is a vital refuge for many woodland birds that are disappearing from other parts of Australia.**

“You can’t help but think, ‘Wow, this is what woodland communities can look like’,” says Bush Heritage senior ecologist Dr Matt Appleby. “Along the creek line you see these beautiful patches of White Box... and if you walk further up the slope you get to the huge, black trunks of the Mugga Ironbark. The Muggas have these enormous, spreading canopies, and when they’re in flower they can be quite noisy with all the birds coming in to feed.”

- ↓ Swift Parrot. Photo by Chris Tzaros/Birds, Bush and Beyond  
 → Dr Matt Appleby on Tarcutta Hills Reserve, NSW. Photo by Annette Ruzicka

## By 2090, modelling shows that Tarcutta's climate will more closely resemble the climates of lower-rainfall areas further north such as Dubbo and Parkes.

According to Debra, the Mugga Ironbark trees on Tarcutta Hills provide Swift Parrots with a supplementary nectar source to the White Box trees. "The nice thing about the reserve is it has both habitat types, [providing the Swift Parrot] with food over a longer period of time than sites that only have one of those species," says Debra.

**P**reserving Tarcutta Hills has not been as simple as purchasing the reserve and letting it be; conservation today requires constant management.

Matt, Bush Heritage Reserve Manager Phil Palmer, and other staff and volunteers travel to the reserve several times a year to control weeds, ensure the fences that keep neighbouring stock out are maintained, and keep an eye on fox and feral deer numbers. They also conduct regular surveys for threatened species and monitor the overall condition of the woodland.



Controlling feral deer takes up a lot of their time. The deer nibble on the tender new growth of young eucalypts and damage their trunks by rubbing their antlers against them. Staying on top of their numbers "is not straight-forward", says Matt, and requires patience and persistence, as well as working alongside neighbouring property owners.

But now, a new threat to Tarcutta's woodland is emerging: tree dieback due to climate change. By 2090, modelling shows that Tarcutta's climate will more closely resemble the climates of lower-rainfall areas further north such as Dubbo and Parkes. If that eventuates, it's likely many of the trees, and therefore birds, on Tarcutta Hills would suffer. And while Matt hasn't seen any clear evidence of dieback on the reserve yet, he has noticed what he calls "early warning signs" in other parts of south-eastern Australia.

In preparation for such a future, Bush Heritage is planning to revegetate a small part of the reserve with 'non-local provenance seedlings' – germinated from Mugga Ironbark and White Box seed taken from drier regions of NSW – as well as local provenance seedlings of the same species. The hope is that the seedlings taken from drier climates will be better adapted to cope with Tarcutta's drier future. As Matt says: "It doesn't mean we expect that these non-local provenance trees will take over. What we actually expect to see is the pollen of those trees mixing with what's already there and improving, in the long-run, the genetic stock of the area."

For the Swift Parrot, as well as many other birds, this forward-planning could prove vital. When dieback does occur on the reserve, the birds will need alternative trees in which they can forage and nest immediately. And since it takes many decades for a seedling to reach that point of maturity, there's no time to waste.

"We've got to get started and do something now," says Matt. "There are 14 threatened bird species on Tarcutta Hills that depend on eucalypts. If those eucalypts suddenly or gradually disappear, then what happens to your bird population? They will also disappear." ●

*Funding for the planting of non-local provenance species on Tarcutta Hills comes from the NSW Environmental Trust's 'Saving Our Swift Parrot' project.*



# Tech rescue

These four emerging technologies are bringing a new dimension to our conservation work, and tipping the odds in the favour of our native species.



## Plains-wanderer Song Meters

Almost by definition, critically endangered species are hard to find and monitor. The cryptic Plains-wanderer is no exception. This small ground-dwelling bird blends in seamlessly with the open plains of arid Australia, where it is generally found, thanks to its dappled fawn feathers. So, when Bush Heritage science intern Emily Matthews saw eight Plains-wanderers during her three months on Boolcoomatta Station Reserve in South Australia, she was surprised to say the least. Her sightings have led Bush Heritage to implement a Plains-wanderer Monitoring Program in collaboration with the National Plains-wanderer Recovery Team.

In Spring this year, 30 acoustic monitoring devices called ‘Song Meters’ will be deployed across Boolcoomatta and on neighbouring properties in suitable Plains-wanderer habitat. Each device will record sounds around it, and those recordings will later be analysed by a call-recognition software program. The technology offers a cost-effective and non-invasive way of simultaneously surveying different parts of this vast landscape over long periods of time. It will improve our understanding of the birds’ preferred habitat, allow us to establish patterns around when they breed, and help us to prioritise our reserve management activities around their known whereabouts.



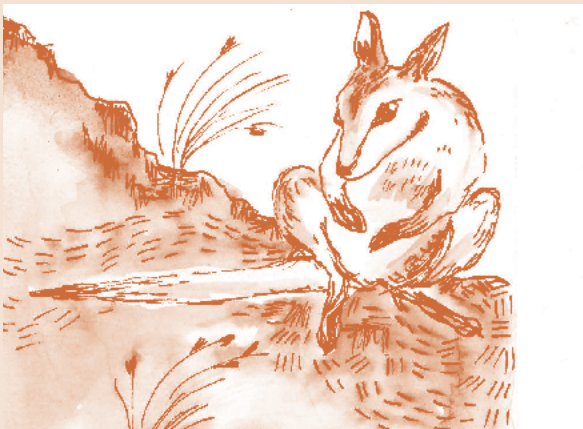
## ‘Felixer’ Grooming Traps

Feral cat control is one of the greatest challenges facing conservationists in Australia. Currently, Bush Heritage is trialling an exciting development in this field: a ‘grooming’ trap that targets cats’ fastidious cleaning habits. When an infrared camera spots and identifies a feral cat, the trap sprays a toxin onto its pelt, which the cat then licks off and ingests. The traps require little effort to install, can be left unattended for long periods of time, and are a very low threat to native wildlife due to their height and the complex algorithms they use to distinguish feral cats from non-target species.

The traps that Bush Heritage is currently trialling are not armed with toxin. Instead, they are only taking photos of animals that pass them by, and classifying them as being either ‘cat’ or ‘non-cat’. Once the trial is complete, those classifications will be cross-checked against the photos to determine whether the traps are sufficiently accurate to be deployed on our reserves.



↓ Illustrations by Iona Julian-Walters



## DNA analysis of rock-wallaby scats

Remote and relatively undeveloped, the far north Kimberley region of Western Australia is a stronghold for many native species. Among them is the diminutive Nabarlek, which is thought to be on the brink of extinction. Efforts to determine how many Nabarlek remain in the wild are hampered by the fact that they look remarkably similar to other small rock-wallabies. In response to this, the Australian Museum, with funding and support from WWF-Australia, developed a new identification tool using DNA analysis of scats.

In 2016, Unguu Rangers from the Wunambal Gaambera Aboriginal Corporation began collecting rock-wallaby scats as part of their regular Healthy Country monitoring program, which has been developed with support from Bush Heritage through our ongoing eight-year partnership. Later in 2016, DNA analysis of scat samples collected by the rangers from a remote island confirmed the existence of an offshore Nabarlek population. Then, in 2017, scats collected by the rangers in the Vansittart Bay area of the Kimberley coast led to the first confirmed record of a Nabarlek on mainland Western Australia since the mid-1970s.



## Satellite fire mapping

Bush Heritage is using high-resolution satellite images from Sentinel satellites to greatly improve our management of fire on our reserves. The technology is allowing field staff to more clearly see how fires have moved through the landscapes they manage, including any recent planned burns or bushfires. This information will help them to identify long unburnt and fire sensitive areas that need protecting or are at risk from damaging bushfires.

We are also providing Sentinel fire scar mapping and technical support to some of our Aboriginal partners across northern Australia. This includes providing geo-referenced high-resolution images so they are able to identify fire history in real time, wherever they are on country, as well as any threatened species, and natural and cultural values that may be under threat from those fires. Access to this technology is assisting our staff and partners to plan and implement best-practice fire management across the country. ●



# Searching for the Goldilocks Solution

An insatiable curiosity and thirst for knowledge have placed Erica Suosaari at the forefront of research into the humble beginnings of life as we know it.

If you'd gone searching for current-day geologist Erica Suosaari in the early 2000's, you wouldn't have found her in a science lab. More likely, you'd have found her on the Alaskan seas working as a crab fisherman, or in Las Vegas, shooting as a commercial photographer.

"I was raised to try anything, ask questions and think for myself," says Erica.

Fast forward to 2018, and it's clear that Erica's curiosity and independent thinking have served her well.

A Bush Heritage Science Fellow and Smithsonian Institute Research Associate, Erica is at the forefront of research into stromatolites; living examples of the oldest preserved life on Earth. Her work aims to uncover the precise conditions that allowed stromatolites to thrive up to 3.7 billion years ago, and in doing so, to provide a window into early Earth.

So, what exactly are stromatolites?

"The bacteria that form stromatolites were among the earliest photosynthesisers; they kicked off the process that saw oxygen levels in Earth's atmosphere rise [from less than 1% to more than 20%] to the point where evolution of higher life became possible, eventually leading to us – humans," says Erica.

There is no better place to study these relics of early life than at Hamelin Pool, which sits within the Shark Bay World Heritage Area and adjacent to Bush Heritage's Hamelin Station Reserve, in Western Australia.

The pool's extreme environment – characterised by high salinity, seasonal variations in water levels and dramatic temperature fluctuations – limits competition and predation, thereby mimicking the kind of setting stromatolites thrived in billions of years ago. Of the few stromatolite assemblages left on Earth, Hamelin Pool is by far the biggest and most diverse.

"The sheer number of stromatolites at Hamelin is just mind-blowing, and then you see all sorts of shapes and sizes as you move around the pool," says Erica.



↑ Dr Erica Suosaari walking among stromatolites at Hamelin Pool, WA. Photo by Annette Ruzicka

“One snorkel and you know you want to be there for the rest of your life... Scientifically, Hamelin has my heart.”

While these grey, rock-like mounds might not make the most thrilling first appearances, five minutes with Erica will have you as excited about them as she is.

“People are surprised when I tell them we wouldn’t exist without the photosynthesis that these microbial mats are responsible for. They shaped the atmosphere over billions of years of Earth’s history. And understanding the past is the key to the future,” she says.

Erica is so fascinated by stromatolites that to study them, she splits her time between three corners of the world: Hamelin Pool; Washington D.C, where the Smithsonian is based; and the Atacama Desert in Chile, where another small, living stromatolite assemblage exists.

While the international travel is gruelling, Erica can’t resist the chance to work on two different stromatolite assemblages. She’s hoping that comparing them will help her to answer one of her biggest questions.

“One snorkel and you know you want to be there for the rest of your life... Scientifically, Hamelin has my heart.”

“If there’s one thing I would like to discover in my career, it would be to understand the ‘Goldilocks Solution’, where you figure out what ‘just right’ looks like for stromatolites. What conditions do they need to thrive? And what does that mean for our quest for life on other planets?”

There are plenty who might share Erica’s interest in such answers.

“If Elon Musk wants to find a way to make Mars habitable,” jokes Erica, “he really needs to pay Hamelin a visit!” ●

A photograph of a man and a woman standing in a natural, outdoor setting. The man, on the right, is wearing a black hat, a purple long-sleeved shirt, and tan pants. He is gesturing with his right hand, palm facing forward, as if explaining something. The woman, on the left, is wearing a white long-sleeved shirt and blue jeans. She is looking towards the man with a slight smile. The background consists of trees and a clear sky, suggesting a rural or natural environment. The lighting is warm, indicating it might be late afternoon or early morning.

# Olkola at the helm

The re-formed Golden-shouldered Parrot National Recovery Team, led by Olkola Elder Mike Ross, is providing fresh hope and optimism for the bird's future.

- ← Bush Heritage ecologist Allana Brown with  
Olkola Elder Mike Ross. Photo by Brian Cassey
- ↘ A male Golden-shouldered Parrot.  
Photo by Geoffrey Jones/Barra Imaging

Olkola Ranger Ashley Ross stands next to a slim grey termite mound almost twice his height. “This is one of the tallest I’ve seen,” he says to the group of 14 or so people gathered around him.

Surrounded by savannah woodland trees of about the same height and colour, the mound seamlessly blends into its environment. It is a part of this country, just like the gold-and-turquoise parrot that calls it home. About a quarter of the way up the termite mound, Ashley points out a small, round opening – the entrance to a Golden-shouldered Parrot nest.

Known as *Akwai* to the Olkola people of Cape York, the parrot used to fly over these savannah woodlands and grasslands in huge flocks. But today, its numbers have dwindled dramatically, and there are thought to be fewer than 2000 left in the wild.

Ashley and the others have come together on Olkola country for a meeting of the newly re-formed *Akwai* National Recovery Team. The meeting is significant for two reasons: it is the first time in 15 years that an official recovery team has been convened for this beautiful bird; and it is also the first time that an Aboriginal person, Olkola Elder Mike Ross, has chaired any threatened species recovery team.

Having Mike lead the team is a huge win for *Akwai*. The parrot is the totem of the Olkola people, and they have a deep understanding of its habitat and ecology garnered over tens of thousands of years.

“It’s exciting for us. We know the country and we know how important it is to look after our totem,” says Mike.

The team has 10 members in total, including representatives from five Traditional Owner groups and Queensland Parks and Wildlife, species expert Dr Gay Crowley, neighbouring pastoralist Sue Shepherd, and Bush Heritage ecologist Allana Brown, who is also the Recovery Team’s Deputy-Chair. Working together, the team will devise a plan that draws on Aboriginal traditional knowledge, cultural understanding and Western science; making it a new model for recovery teams.

As the Olkola *Akwai* Project Manager, Ashley will be heavily involved in the plan’s on-ground implementation.

“I enjoy being out on country - setting up monitoring cameras, searching for *Akwai*, taking [vegetation] plots and things like that,” he says. “I feel a sense of freedom, and I belong here. It’s really good.”

Having Mike lead the team is a huge win for *Akwai*. The parrot is the totem of the Olkola people, and they have a deep understanding of its habitat and ecology garnered over tens of thousands of years.



↓ Olkola Alwal Project Manager Ashley Ross

Already, Ashley and other Olkola rangers, with support from Bush Heritage, have identified key threats to *Akwal's* survival and are working to control them.

Last year, for example, remote monitoring cameras captured images of a feral cat raiding one of *Akwal's* nests, providing the first evidence that feral cats prey on the bird. A joint project between the Olkola Aboriginal Corporation, Bush Heritage and the University of Queensland is now investigating new ways of controlling feral cats on Olkola country.

Rangers have also been working to protect *Akwal* from natural threats, including predation from Butcher Birds and Goannas, and annual food shortages. For the past two years, they have set out supplementary seed in predator-proof feeders during the wet season. Immature birds are particularly vulnerable during this period and can die of starvation because

grass seeds germinate resulting in a lack of seed available for eating. Changes in fire regimes have also resulted in the loss of open grasslands; the parrots preferred habitat. Without the natural disruption that fire causes, ti-tree and other shrubby growth has encroached on the grasslands, providing added cover for Butcher Birds and Goannas. To combat this, rangers are reinstating both natural and traditional fire regimes.

At the heart of all this work, one consistent theme emerges as being critical to saving *Akwal* – having Olkola people on country, caring for their totem. ●

*The Bringing Alwal Home project is supported through funding from the Australian Government's National Landcare Program, the Queensland Government's Everyone's Environment Program and the Scully Fund.*



“I feel a sense of freedom,  
and I belong here.  
It’s really good.”

## Parting shot

# My happy place

Kate Taylor

Bush Heritage Project Officer

@my\_desert\_life



Sitting under this Western Myall and looking out over the salt lake is one of my favourite spots to stop for lunch and is luckily exactly the halfway mark when I do my rounds, checking the camera monitoring grid on Bon Bon Station Reserve. This has been my lunchroom for one day every month for the last two years. While I am here, I like to think about whom, over the years, has visited this area and also admired its beauty.

I love the feeling of being out in the bush, on Antakirinja Matu-Yankunytjatjara country, and

knowing I am the only person out here within thousands of hectares. I enjoy listening to the wind blowing through the Black Oaks that hug the western side of the salt lake (right of photo). I love listening to the chorus of birds, which always seem to be chirping away; I never forget to pack my binoculars. I notice the different birds that visit during different times of the year and the buzzing of the many native bees and wasps as they busily pollinate plants such as the Sturts Pigface, which grows below the canopy of the great Western Myall when in flower. ●



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### Thank you

Bush Heritage gratefully acknowledges the estates of: Toni Hamilton; Viv Donovan in remembrance of her late son, Paul Francis Donovan; Margaret Elizabeth Garner; Evelyn McEwan Livingston; and Jay Birnbrauer. We also thank Environmental Research and Assessment Pty Ltd, which donated in memory of Dr Rob Leslie, a leading Australian geographer and ecologist.

Thank you, also, to the many other people who support our work. Together, we are returning the bush to good health.

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