bush*tracks*

Bush Heritage Magazine | Summer 2020

Smart country

In arid Australia, where the rains are unpredictable, the land has evolved to take advantage of every splash and flush of water.

Afterlife

Emma Spencer is studying carcasses to find out how they impact the living world around them.

River people

How restoring the upper Murrumbidgee is helping to connect the communities living alongside it.

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

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A Great Egret by Georgina Steytler, an award-winning nature photographer with a passion for conservation. Check out her work at: www.georginasteytler.com.au

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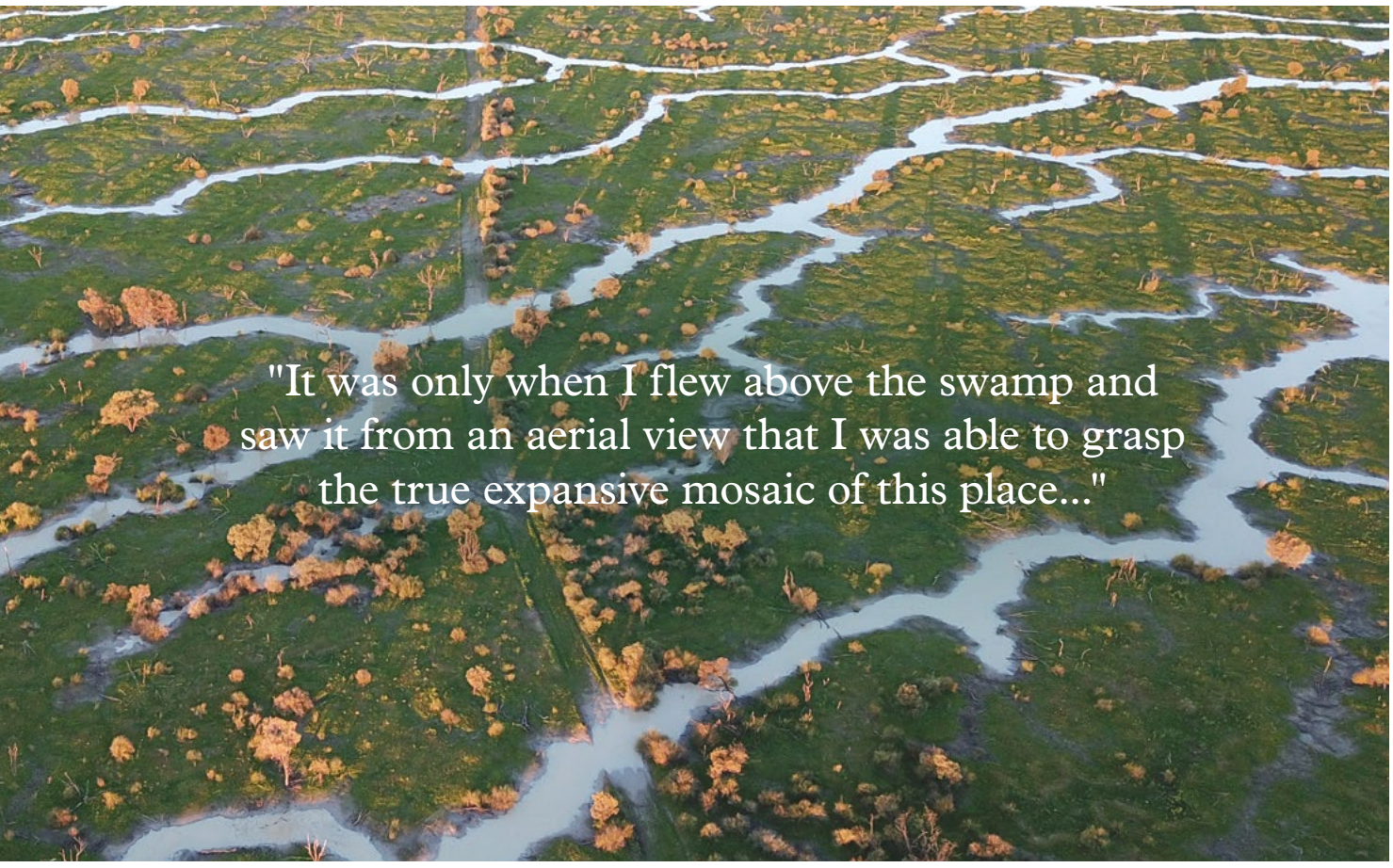
↑ Yantabulla Swamp, NSW, in flood in April 2019. Photo by Kylie Fisher/Land and Life Photography



Earlier this year I travelled from my home in Melbourne to the north-western corner of NSW, where Bush Heritage's Naree Station Reserve is nestled two hours' drive north of Bourke, on Budjiti country.

We were lucky in that our trip coincided with a major flooding event. Big rains in Queensland had threaded their way south, their waters eventually mingling with local rainfall to fill the wetlands and waterholes of Yantabulla Swamp.

Bush Heritage manages about 17 percent – 32,127 hectares - of Yantabulla Swamp through Naree and the neighbouring reserve, which we are in a partnership to care for. I knew these figures before my trip, but it was only when I flew above the swamp and saw it from an aerial view that I was able to grasp the true expansive mosaic of this place, which is one of the most significant water bird breeding sites in Australia.

That trip was in mid-June. As I write this message in early November, the last water from those floods is drying up – there's been no significant rain on Yantabulla or in the catchment area since April. It's a potent reminder that water cannot be taken for granted in this landscape, or anywhere for that matter.

Freshwater is the lifeblood of this country. Waterways such as the Cuttaburra Creek which feeds one side of Yantabulla, and the Murrumbidgee River which flows through our Scottsdale Reserve and on to Canberra, have sustained humans, plants and animals for millennia. And they will continue to do so if we look after them.

This summer is forecast to be hotter and drier than most for almost all of Australia. Through it, we'll be supporting our reserve managers, ecologists, field officers and partners to deal with the challenges that inevitably arise in such harsh conditions in order to keep them and the landscapes we protect safe. I also want to acknowledge the farmers and people of rural Australia who are doing it tough in this drought – our thoughts and thanks are with you.

Heather Campbell
Chief Executive Officer

Smart country

At Naree Station Reserve, water is as precious and rare as gold. Our job: to make sure that when the water comes – either from the sky or down the rivers – the land is ready.

STORY BY KATE THORBURN

←
Yantabulla Swamp in flood.
Photo by Justin McCann

Water has left its mark on Naree Reserve like fingerprints on a soft peach.

Driving around Naree, you feel these marks before you see them. A slight dip as you approach an old fence line delineates a once thriving wetland. A lurch upwards the first sign you're entering a floodplain system. A sudden bump? Odds are you've hit a gilgai – small mounds that occur when water causes clay soil to swell then crack as it dries.

"Signs of water are everywhere you turn here," says Bush Heritage ecologist for New South Wales Dr Vanessa Westcott. Yet while the imprints of it can be felt, water is often nowhere to be seen.

Two things can be said with certainty about the rainfall at Naree – it's wildly variable and entirely unpredictable. The reserve's average annual rainfall is around 300 millimetres but some years it's double that, and some years it's less than half.

But this is smart country, Budjiti country, the famed 'back o'Bourke'. The plants and animals here have evolved over millenia to persist even when it's chip dry, as it was earlier this year and still is for much of the region.

Naree is part of Yantabulla Swamp, one of Australia's most important water bird breeding sites, in the north-western part of the Murray-Darling Basin. Bush Heritage has responsibility for about 17 percent of this swamp through the management of Naree and the neighbouring Yantabulla Station (another reserve, owned by the South Endeavour Trust).

Bush Heritage has been working hard here since purchasing Naree in 2012, controlling destructive feral goats and pigs and removing invasive weeds like Buffel Grass and Mexican Poppy, which spread like a rash at the first sign of moisture.

This year, Naree was one of the lucky places in this corner of the Murray-Darling Basin.

In March, flows from big rains in Queensland threaded their way south down the Warrego River and along the Cuttaburra Creek on Naree's southern edge, spreading out over the reserve's alluvial floodplains in what's known as a *dry flood*. Two weeks later, 69 millimetres of rain fell locally.

"The land breathed a huge sigh of relief," says Naree Reserve Manager Greg Carroll. "Soil seed banks and plants that had lain dormant and looked dead suddenly started sprouting and flowering. Budgies

↑
Great Egret chicks on Yantabulla Swamp.
Photo by Brian Redman

↑
Budjiti Elders Phil Eulo and Aunty Ruby on Naree Reserve.
Photo by Helen Davidson/The Guardian

turned up, the frogs were deafening… everything just came to life."

Budjiti Elder Phil Eulo visited the reserve soon after with his family. He described the change in one word: "magic".

"The trees were flowering, even the colour of the leaves was different," recalls Phil. "It was beautiful to see the green shoots coming out of the old dry stuff… it was amazing how it could change so quick."

For hundreds of generations, Phil's ancestors have called this part of north-western New South Wales, and over the border into southern Queensland, home. For them, water was a constant sight — natural springs covered the landscape, pushing up from the Great Artesian Basin.

"My people didn't have to leave this area," says Phil. "They had the water, they had food, they had everything here. We had Pademelon (small kangaroos) and native fish… there was food and water all year round."

Evidence of Budjiti people's longstanding connection to this country is everywhere — in the piles of blackened rocks from old oven hearths, the tell-tale pattern on rock shards from repetitive striking, and the smooth, rounded surface of grinding stones.

Today, most of the springs on Naree and in the surrounding region are extinct — dried up due largely to declining groundwater levels and aquifer pressure — making flooding events like the one in March even more precious.

"As a relatively unregulated and unmanipulated natural system, Yantabulla Swamp is a very special place to look after," explains Vanessa.

"Further south in the Murray-Darling Basin, there's an inclination for water availability to be more regular and more constant. Up here we don't have that, and that's what's really unique about this area."

In major wet years, migratory water birds flock to Yantabulla Swamp in their tens of thousands to breed. But a breeding event didn't occur in April. Vanessa believes this was partly because it was the wrong time of year, and possibly because flooding of other lakes offered water birds better breeding grounds.

As part of Bush Heritage's preparations for the next breeding boom, 24 motion sensor cameras were recently hammered into the drying ground across Naree and Yantabulla Station.

The data captured by these 'eyes on the ground' will provide insight into the activity of feral pigs, goats, foxes, cats and rabbits, and reveal more about the native species using Yantabulla's Coolibah-Black Box woodlands, which the NSW Government classes as a threatened ecological community.

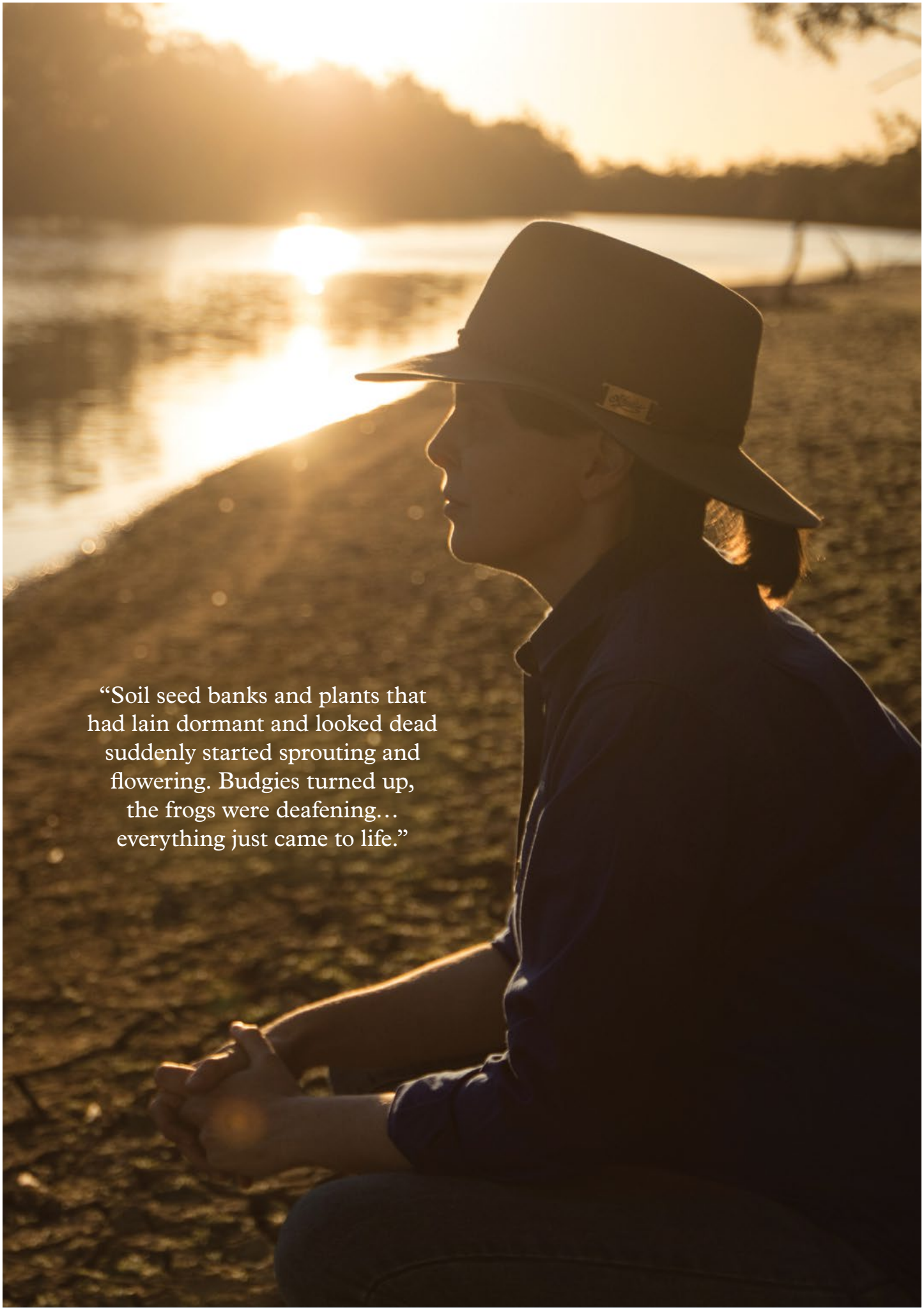
At the time of writing – late October – the land is mostly dry again except for a few places including Naree and Yantabulla's Back Creek Swamp and the culturally significant Mukudjeroo waterhole.

For Phil, the way forward is simple.

"I'd like everyone to have respect for water," he muses. "Everyone owns the water, no one special person owns the water. It's for everyone to share."

The new motion sensor cameras have been supported by the NSW Government's Saving our Species program. •

→
Bush Heritage Ecologist for NSW Dr Vanessa Westcott.
Photo by Amelia Caddy


“Soil seed banks and plants that had lain dormant and looked dead suddenly started sprouting and flowering. Budgies turned up, the frogs were deafening… everything just came to life.”

Food for thought

In the central-west Kimberley, near the town of Fitzroy Crossing, the Bunuba community has created a legacy for generations to come.

STORY BY ELIZA HERBERT

If you spend enough time caring for country, as Bunuba people have for thousands of years, you will get to know its signs and stories.

Full of iconic *winamu* and *balili* (limestone and sandstone ranges) rising high above surrounding *galanganyja* (black soil plains), and culturally significant *garuwa* (water places), Bunuba *muwayi* (country) is home to many bush plants and foods. Now, in a book called *Yarrangi Thangani Lundu, Mayi Yani-u*, the Bunuba community have shared their knowledge of *muwayi* and the stories of their abundant, beautiful and lifegiving part of the world.

Yarrangi Thangani Lundu, Mayi Yani-u is for the next generation of Bunuba kids, so they can keep their language, culture and country strong.

1 *Malaa*/Freshwater Mangrove (*Barringtonia acutangula*)

This is a tree of many uses. The leaves and bark are poisonous to some fish and can be crushed and thrown into waterholes where, after some time, the fish float to the top to be collected and eaten.

While poisonous to fish, it can be medicinal to people. Chewed bark soothes the pain of a catfish-barb, a barramundi sting or an aching tooth. It can also stop bleeding and help heal wounds. The only side effect: a bit of drowsiness.

Malaa grows up to 8 metres tall and can be found along rivers, creeks and floodplains. When the *Malaa's* red or dark pink flowers bloom, the *gayi* (freshwater crocodile) are laying their eggs: ready to be dug up, cooked and eaten.

2 *Biriyali*/Conkerberry (*Carissa Lanceolata*)

On Bunuba *muwayi*, *Biriyali* is often collected by shaking the tree so the *mayi* (fruit) fall onto a groundsheet. It is good to eat when the fruit are black and 'cook' (ripe) and should be avoided when green or red (unripe). Bunuba people use smoke from the burning wood to deter mosquitos, and in ceremonies to drive spirits away and give babies strength.

Biriyali is a thorny shrub or small tree that grows up to 3 metres high on sandy or loamy soils across the Kimberley. It has small, black, edible *mayi*, pointed green *wanjali* (leaves) and white *wirru* (flowers), which form in bunches at the end of the stem. The *malarri* (bark) is grey-brown and slightly tessellated.

3 *Larrgari*/Boab (*Adansonia gregorii*)

Fire is common across Bunuba *muwayi* and Bunuba people know which plants are sensitive to big, hot fires and which are resistant, like the distinctive *Larrgari* tree.

When *Larrgari's* large, creamy-white *jawarrjaliny* (flowers) bloom, it's a sign that the rainy season is coming. Plants like *Larrgari* that indicate seasonal changes are very important to Bunuba people.

The *wajarri* (fruit) is a large, oval, furry capsule. When it is brown and ripe, the flesh can be eaten; it is often ground up and mixed with sugar to create a custard-like pulp. It ripens quicker in hot sand and the seeds can be eaten after being roasted in hot ashes.

When water is scarce, kangaroos dig out the pulp to eat and hydrate.

4 *Muraga*/Inland or Desert Bloodwood (*Corymbia opaca*)

High up on the orange and brown branches of *Muraga* trees you'll find *balabi* (Bush Coconuts), an important bush tucker food that's a combination of plant and animal.

Balabi occur when a female scale insect irritates the tree until it forms a woody growth, called a gall, around the insect. The female insect then spends the rest of her life in the gall, mating with males via a small air hole.

Balabi can be cracked open using a sharp rock to access the sweet and nutritious flesh inside; the insect is usually eaten as well. *Balabi* is ready to eat during *girinybali* (when the rains have finished).

When *Muraga* blooms, it means cold weather is arriving.

Yarrangi Thangani Lundu, Mayi Yani-u *was produced with support from Bush Heritage and other financial partners, including Environs Kimberley. These are just a few of the plants featured in the book.*

←
Images courtesy of Environs Kimberley and the Bunuba community

River people

Antia Brademann discovers that for the people who live and work on the upper Murrumbidgee River, it is more than just a waterway; it is a way of life that connects them all.

STORY BY AMELIA CADDY

From its headwaters in the Snowy Mountains, the Murrumbidgee River drops sharply down onto the Monaro high plain where it carves its way through Ngarigo and Ngunnawal country, around the flanks of Bush Heritage's Scottsdale Reserve and onto Canberra. Restoring the health of this part of the upper Murrumbidgee is at the heart of Bush Heritage's partnership with the Upper Murrumbidgee Demonstration Reach (UMDR). We spoke to UMDR Facilitator Antia Brademann to learn more.

Why did you start working on rivers?

I grew up on the upper Murrumbidgee near Bredbo and ever since then I've wanted to work on rivers. Rivers are such precious ecosystems. They connect the whole landscape and the community as well. Rivers and wetlands are essential for life!

I completed a Bachelor of Natural Resources specialising in aquatic ecology, and then moved back to this region when I had kids. I've been working on the upper Murrumbidgee for eight years now and one of the best things about this job is that you can go out onto the river a million times and there's always something new to see because things are always changing.

You're working on a specific part of the upper Murrumbidgee. Can you describe it for me?

The UMDR initiative was established in 2010 and focused on a section of the upper Murrumbidgee, which is about 100 kilometres long and runs from Bredbo in NSW, past Bush Heritage's Scottsdale Reserve, and through to Casuarina Sands in the ACT.

In this area, the waterways are characteristically crystal clear, fast flowing and cool. You have these deep, rocky gorges where native vegetation persists and then also broad valley flats where the riparian vegetation has been mostly cleared. The species that live here such as Trout Cod, Macquarie Perch and Platypus are adapted to these conditions.

We are now working to expand our focus to the whole of the upper Murrumbidgee River from Tantangara Dam to Burrinjuck Dam, a section which is about 380 kilometres long.

Restoring a river must require working with so many different stakeholders. How do you stay across everything and keep everyone engaged?

Most people who buy a property connected to the Murrumbidgee do so because they care about the river; there's a real sense of shared appreciation for it in this community that's quite special. So, I think that inherent connection is the path through which we engage people with working towards a healthier and more resilient river system.

At the end of the day, the upper Murrumbidgee is one of Canberra's water supplies. So, in a very utilitarian sense, ensuring its waters remain clean into the future is in the interests of hundreds of thousands of people.

The UMDR, supported by Bush Heritage, works with landholders all along the upper Murrumbidgee to encourage actions that will benefit river health like fencing out stock, preventing disturbance from roads, controlling weeds, fixing erosion along banks and in tributary gullies, replanting native vegetation and improving instream habitat. The challenge is getting all our projects to link up. It's such a huge ecosystem with such long boundaries, so improving connectivity is very complex.

Why is connectivity so important for river health?

The science tells us that a break in vegetation as small as 50 metres along the banks of a river can start to affect river health. There are a whole host of benefits associated with riparian vegetation. It filters runoff and thereby protects water quality, it helps with bank stability, provides shade that helps regulate water temperature. And it provides cover and protection for lots of different animals. For example, young Platypus will often be exploring on the bank so if the banks are bare, they will be vulnerable to predation. So, losing riparian vegetation can impact river health in lots of ways, but luckily we find that when we restore that connectivity, there are benefits not only for the immediate site but also downstream.

The UMDR is a collaborative initiative funded and supported by key partners including Bush Heritage Australia, the Murray Darling Basin Authority, the ACT Government, Upper Murrumbidgee Waterwatch, Icon Water, the Australian River Restoration Centre, Local Land Services, University of Canberra and the NSW Government. For more information, visit www.upperbidgeereach.org.au

↑
UMDR Facilitator Antia Brademann by the Murrumbidgee River, NSW. Photo by Amelia Caddy.

Afterlife in the outback

This University of Sydney researcher is helping us understand how carcasses might be putting our native species at risk.

STORY BY VIKI CRAMER

A cow's body sprawled on a parched plain of red sand, stomach bloated and eyes missing, is an image of death that conjures the harshness of outback Australia.

But in the eyes of Emma Spencer, a PhD candidate at the University of Sydney, that carcass in the desert is an island of life in a sea of sand.

"Carcasses are incredibly interesting," she says. Yet little research has been done on them.

Emma has been studying the fate of carcasses on Bush Heritage's Ethabuka Reserve, located on Wangkamadla country on the northern edge of the Simpson Desert in far western Queensland, for about two years now.

In the boom-and-bust of outback Australia, carcasses can be an important food source, even for species not usually thought of as scavengers like the Willie Wagtail. While many carcasses arise from natural deaths, the control of feral animals, such as camels and goats, contributes many more.

"I'm really interested in exploring how [culling] – which occurs for the benefit of the system, whether for agriculture or conservation – could have unintended impacts," she says.

For her research, Emma sourced animal remains from road kill or approved sources. She relocated the carcasses to the reserve, fixed each in place to stop scavengers from dragging them away, and set up remote wildlife cameras to see which animals came to feed.

The carcasses attracted all sorts of scavengers, from native Wedge-tailed Eagles, Sand Goannas and Dingoes to introduced Red Foxes and feral cats. But all these species are also predators, on the lookout for other easy meals nearby. This means that for some vulnerable animals the mere presence of a carcass could increase their chances of being eaten.

To understand whether the presence of dead animals affects ground-nesting birds, Emma made fake Little Button-quail *(Turnix velox)* and Night Parrot *(Pezoporus occidentalis)* nests and placed

them in areas with and without carcasses. Button-quail nests are little more than a scrape in the sand furnished with a few feathers, and they are usually located at the edge of clumps of vegetation. Night Parrots, on the other hand, build their nests deep within mounds of spiky spinifex grass. While the endangered and highly elusive Night Parrot is not found at Ethabuka, it has been recorded in similar environments and in Bush Heritage's Pullen Pullen Reserve.

Emma found that the fake Little Button-quail nests were raided most often by Little Crows and Australian Ravens.

In the boom-and-bust of outback Australia, carcasses can be an important food source, even for species not usually thought of as scavengers like the Willie Wagtail.

↑
Clean bones on Ethabuka Reserve.
Photo by Hayden Griffiths.

→
PhD candidate Emma Spencer.
Photo by Barefoot Media.

↑
A Red Fox scavenges on a carcass in the desert.
Photo by Jiri Lochman/Lochman Transparencies

"They're everywhere," she says. "They fly around these arid environments so quickly. But they couldn't get into the Night Parrot nests – they just couldn't stick their heads in there."

Yet there was one animal that could get its head deep into a clump of spinifex to raid the fake Night Parrot nests: the Red Fox.

"The fox was so efficient. Every single time I saw a fox on a carcass, pretty much the same night all the eggs in that area would be gone," says Emma.

Luckily, foxes are not present at Pullen Pullen but Bush Heritage regularly undertakes predator control on the reserve and monitors for their presence.

Emma's research has shown that even small carcasses can have a big impact on the areas immediately surrounding them. In the arid environment of the Simpson Desert a large carcass such as that of a camel may last more than a year. Emma has observed that these bigger carcasses are so valued that animals will return again and again, spraying them with urine to mark them as their territory.

If a camel carcass is left under a stand of Gidgee trees, where birds often nest in large numbers after heavy rain, it will probably attract feral cats and foxes and increase the risk of predation for those birds, says Emma.

Emma's research has shown that even small carcasses can have a big impact on the areas immediately surrounding them.

To reduce these types of negative impacts, she says land managers need to be cautious when culling feral herbivores such as camels at times when other species might be particularly vulnerable, or, if culling must happen, move the carcasses away from sites where vulnerable animals are known to breed.

Yet it's important to remember that dead animals are a natural and essential part of an ecosystem.

"The primary scavenger of carcasses in the Simpson Desert is the Wedge-tailed Eagle. They often arrive first and feed the most," says Emma.

"There are still a lot of positive things that carcasses do and we can't forget that in our management." •

Parting shot

My happy place

Greg Carroll
Naree Reserve Manager

Mulga is one of those unusual plants that sheep and cattle will eat, so it has disappeared from a lot of the old cattle properties. We've owned Naree for seven years now — before that it was a sheep station — and we're trying to allow the Mulga here to regenerate but it takes a long time to grow, so in the meantime we need to keep feral goats, pigs and stray stock away.

There's an area here on Naree that more closely resembles a healthy, natural Mulga woodland; there's a thick overstorey and a lot of leaf litter underneath.

When we get a bit of water on Naree, like we had earlier this year, you get these carpets of new growth there – wildflowers, daisies.

It's a step towards what we're trying to achieve, which is old growth Mulga. It grows so slowly – and it's such a harsh climate here - that it could be years before we get what we're aiming for. At the moment you won't see too many of the bigger Mulga trees around Naree, but we'll get there with time.

↑
Naree Reserve Manager Greg Carroll amongst native wildflowers in a healthy Mulga woodland on Naree. Photo by Amelia Caddy

↗
A Great Egret. Photo by Georgina Steytler

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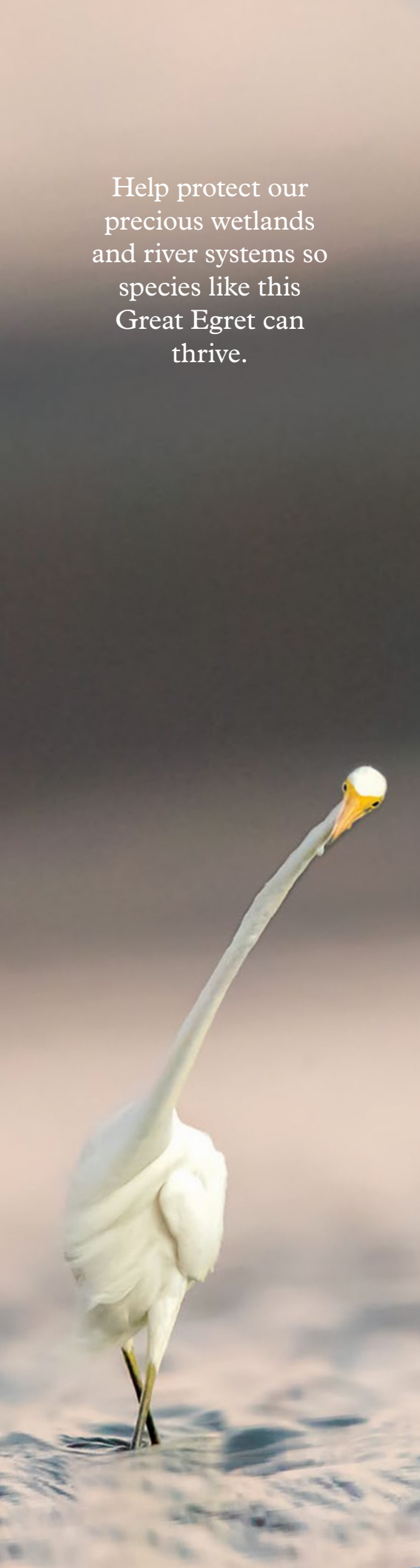

Bush Heritage Australia

Bush Heritage is an independent, non-profit conservation organisation that buys and manages land, and partners with Aboriginal people, to protect our irreplaceable Australian landscapes and native species.

Founded by Bob Brown in 1991, it has since grown to protect and help manage over 11 million hectares - that's more than all of Tasmania. These landscapes span from rainforests to woodlands, savannas to deserts, and everything in between.

Our work would not be possible without the support of people like you. We gratefully acknowledge the estate of Elizabeth Hartnell, as well as the many other people who have recently donated.

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