BUSHTRACKS

Bush Heritage Magazine — Autumn 2025



Features — Trial time, Accounting for Austin Downs, Lightning response, Wantiku tjuma (Women's story)



We acknowledge the Traditional Custodians of the places in which we live, work and play. We recognise and respect 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 women-only ranger trip helps to keep Martu knowledge strong.



For the Buloke tree (Allocasuarina luehmannii), which typically takes 100 years to mature, change happens on a peacefully drawn-out timescale, contrasting with the rapid emergence of colourful Vermilion Grisette (Amanita xanthocephala) after rain in nearby woodlands. Despite their differences, and like all species on Earth, they are in a perpetual state of transition.

The stories in this Bushtracks demonstrate the inspiration Bush Heritage draws from nature's ever-expanding qualities and the science-led work we deliver to enhance these qualities.

In 'Trial time' at Nardoo Hills Reserve in Victoria, Dja Dja Wurrung Country, we celebrate five years since climate-adjusted seedlings were planted and share early insights from recent monitoring. Through this experimental trial, we are growing knowledge on future best-practice restoration for eucalypts.

As the south of the country becomes cooler and the north emerges from the wet season, we begin to roll out prescribed burns across our reserves. Late last year, two uncontrolled blazes threatened Carnarvon Station Reserve, Bidjara Country, Queensland. 'Lightning response' describes our increased capacity to respond to fire as a threat and the lessons we will apply to this year's fire management.

We visit the shifting sand dunes of Martu Country in the centre of Western Australia. Here, a women-only ranger trip is helping to fortify cultural knowledge, including a deep understanding of the arid region's flora and traditional ways of looking after Country, both of which complement Western science and all work together to operationalise the Birriliburu Healthy Country Plan.

Across the globe, the latest research indicates that we are destroying more biodiverse landscapes each year than we are managing to protect, and leading scientists are calling for trail-blazing action if we're to avoid the worst of the interlinked biodiversity and climate crises. We're in a position where the protection and management of every hectare and conservation effort counts.

At Bush Heritage Australia, we're committed to trying new approaches and innovative partnerships to help deepen and double our impact by 2030, an example of this which you will read about in 'Accounting for Austin Downs'.

Enjoy this edition and know that, through your support, our work continues to grow and evolve – just like nature itself.



Rachel Lowry Chief Executive Officer



Trial time

Words by Sara Phillips
Location Dja Dja Wurrung Country, Victoria

Sourcing seeds from afar to give eucalypts a chance against climate change.

Photo The patient wait for flowering time and bees to visit, Dja Dja Wurrung Country, Victoria. By Grassland Films

"It's a scary thing to

Eleanor Hetharia, Bush Heritage's Head of Region South-East, will never forget what she saw at Nardoo Hills Reserve in early 2014.

"It was just a grey landscape. The green leaves had fallen." It was on the back of the Millennium Drought, when rainfall in central Victoria was the lowest on record. The reserve, halfway between Melbourne and Mildura on Dia Dia Wurrung Country, had experienced two unexpected heatwaves in quick succession. Mature trees, already stressed, couldn't take another hit. "It's a scary thing to witness not just one or two trees that are dying, but landscapelevel dieback," says Eleanor.

While some trees managed to resprout, the mass mortality brought the future threat of climate change crashing into the present for staff and volunteers.

With the CSIRO and the Bureau of Meteorology predicting hotter, drier weather for Nardoo Hills, our team analysed the odds of an event like this happening again and began questioning, "What could be done to improve the trees'

chance of survival?" This seeded the beginning of the Climate-Ready Revegetation Research Project.

The trees most affected by the 2014 dieback were Yellow Box (Eucalyptus melliodora) and Grey Box (E. microcarpa). One of our stalwart volunteers, Dr Garry McDonald started thinking about what could be done to prepare our reserves for future climate shocks. Garry was an entomologist at the University of Melbourne until his retirement in 2016, so he called upon his former science colleagues for suggestions.

Together, Garry, his colleagues and Bush Heritage ecologists hatched a plan to try 'climate-adjusted provenancing'. This idea, first floated in 2015 by CSIRO scientists, is to source seeds from areas that are similar in climate now to the climate predictions for the parcel of land undergoing revegetation. "We said, 'Ok we can give this a crack'. We can try this out and provide on-ground evidence that this does or doesn't work," says Garry.

The idea is that Yellow Box and Grey Box growing in warmer and drier regions have already evolved to be more resilient to such conditions. Collecting their seeds and planting the propagated tubestock at Nardoo means genes for hot and/or dry-weather resilience are introduced to the neighbourhood. When bees move pollen from flowers of the trial trees to flowers of trees already on the reserve, the expected result is seed with some genes that are advantageous under hotter, drier conditions. It is hoped that the trees that germinate from this seed fare better under future heatwaves.

Using a CSIRO tool that draws parallels between present climate in one location and future climate in another, the team identified four regions for seed gathering for each species, which corresponded to predictions ranging from severe climate change

> to more moderate climate change. Seed specialists from

seeds were nurtured and planted on Nardoo. The team also cultivated local seed for comparison.

across New South Wales and witness not just one or two South Australia volunteered to trees that are dying, but source the best seeds. Then, through 2019 and 2020 with the landscape-level dieback." support of Greenfleet and Arborline Nursery, the precious

> The science experiment took a hit in the first few months, with very dry weather and weeds taking their toll on the tiny trees. But since April 2020 around 94 percent have survived, meaning 5,324 trees remain at the time of writing, some of them reaching six metres high. These trees are being monitored for height, girth, and other measures such as how much insect damage a tree might have. The monitoring is the combined effort of staff and dedicated volunteers.

> Rowan Mott, ecologist for Bush Heritage's South-East, says the project will determine whether bringing in seed from afar is a worthwhile strategy for future revegetation projects. Climate change related dieback is not only a problem for Nardoo, but around the country, and the world.



Photo Volunteers measure the height of growing eucalypts, Dja Dja Wurrung Country, Victoria. By Grassland Films

So far, the Yellow Box seeds sourced from Junee, New South Wales, seem to be surviving slightly better than the local saplings. But Rowan cautions that it's very early days. It's possible that some of the young trees might have concentrated their efforts into putting down roots, rather than shoots, and that such trees might be more resilient if the present wetter weather dries up. "Trees that are coming in from drier locations might not have actually been challenged yet," he says. While not wishing for drought conditions, Rowan says his scientific curiosity will fire up when Nardoo encounters a dry spell.

Supported by funding from Eucalypt Australia, ecologists are also working with academics from La Trobe University to undertake genomic analysis on the trees to provide tangible evidence that genetic differences exist among provenances within the research trial. It will also allow us to track the relative genetic contribution of climate-adjusted or local provenances to new seedlings that germinate on the reserves. These efforts will provide valuable insights as the trees experience weather extremes and changes.

Preparing Nardoo for the reality of climate change is of vital importance. The reserve sits on the border of

multiple different bioregions, making it a melting pot for species' diversity. Shy Heathwrens and Yellow-plumed Honeyeaters flutter about the mallee country to the north, while Diamond Firetails and Black-chinned Honeyeaters chirp among the Box-Ironbark woodlands to the south. Ecologists and reserve staff even discovered an orchid (*Pterostylis valida*) that was thought to be extinct for several decades.

The real results of the project won't be known for a long time, as we wait to see how much the climate changes. Meanwhile, the data are being shared with scientists at the universities of Melbourne, La Trobe and Macquarie. Already, two papers describing the trial have been accepted to scientific journals, and a PhD student, Rhys Browning, is writing his thesis on the experiment, with support from Bush Heritage donors.

Last autumn, some experimental trees showed they are already reaching reproductive age, with the first fuzzy blossoms beginning to unfurl. As the trial continues, we can only ponder, with some excitement, how far their pollen might move and how long it takes for nature to select the next generation of resilient trees. •

We gratefully acknowledge the many volunteers and partners involved in the project, and in particular, Eucalypt Australia's funding towards genomic research.

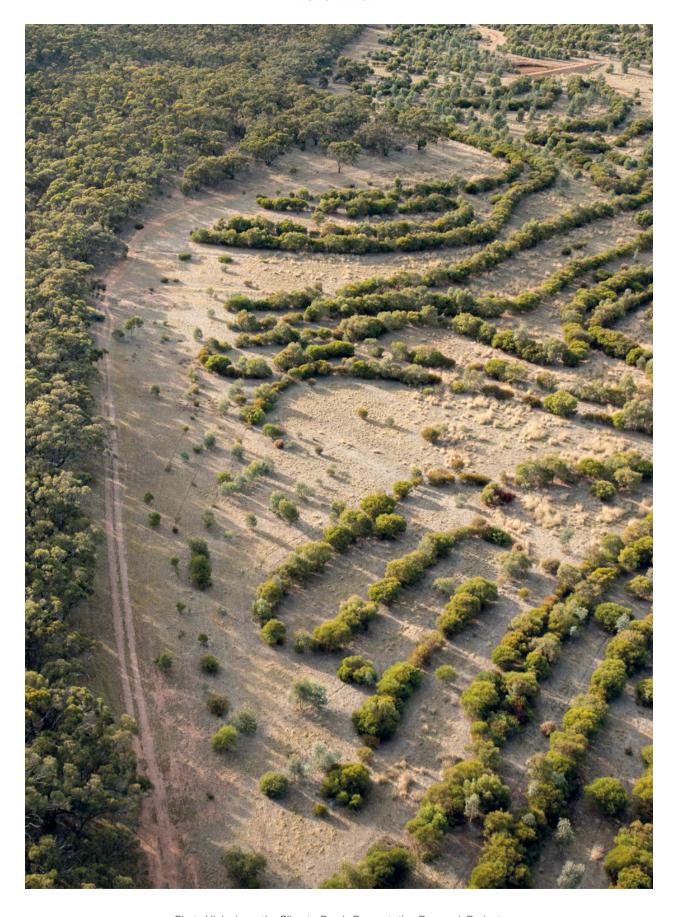
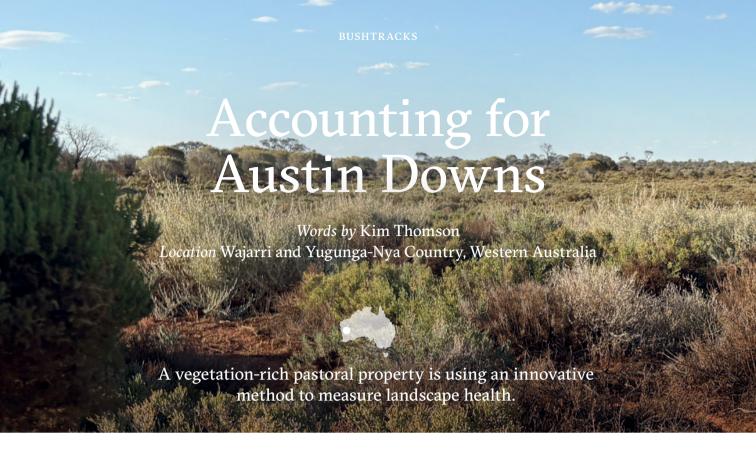


Photo High above the Climate-Ready Revegetation Research Project, Dja Dja Wurrung Country, Victoria. By Grassland Films



Sprawling across 167,570 hectares in the Murchison region of Western Australia, Austin Downs teems with life. But this wasn't always the case. At the turn of the millennium, the property's landscape, which is located 300 kilometres inland from Geraldton, had been thoroughly degraded from decades of mismanagement and lack of vital winter rainfall from shifts in climate.

"When we got to Austin Downs, it was just a totally unresponsive system," said Tom Jackson, the late leaseholder. "It was an absolute disaster."

Since taking on the property in 2001, Tom and his family committed to breathing new life into the land-scape. After switching from sheep to grazing cattle in much smaller herds, they managed to encourage extensive ground cover and new species growth.

The property today is virtually unrecognisable from that of 25 years ago. "The country is just unbelievable," said Tom. Now, the landscape boasts abundant grasses, summer perennials and a huge range of Emu Bush.

"We've had people who knew the country coming through and saying, 'My goodness me, I didn't believe you could get it back like this.'"

The family wanted to measure – in a precise way – what they had achieved, so they signed up with

Accounting for Nature, an organisation that helps quantify landscape health.

"We wanted to get a baseline," explains Jo Jackson King, Tom's daughter. "Otherwise, how are we going to know if we are actually improving the country further?"

With 55 percent of Australia's land managed for agriculture, we partner with farmers and landowners, such as Jo's family, to allow our impact to flow beyond our reserves' boundaries.

It can be a tricky, time-consuming task to survey landscape health – especially over large expanses of land. To meet this challenge, a certified drone and field-based method known as the Integrated Vegetation Condition Method (IVCM) was applied at Austin Downs. This methodology takes so much of what we have learnt managing reserves and makes it accessible to landholders in agriculture.

Dr Matt Appleby, senior ecologist for Bush Heritage, says the method combines the advantages of drone technology with the expert eye of an ecologist working on the ground. Based on its composition, the Austin Downs site was divided into four vegetation communities – mulga, greenstone, granite, and samphire/bluebush/saltbush – and a number of five-hectare plots randomly allocated across each type.



"The drone flies up and down in a systematic way to cover those five hectares," says Matt.

"That's quite a large area compared to traditional vegetation surveys done on the ground – at most, a plot might cover a hectare."

Matt says the drone captures high-resolution imagery and overcomes common surveying

challenges. "It can be quite tricky and time-consuming to get a very accurate figure for canopy cover and shrub cover using traditional, ground-based methods," he says.

"So, a drone gives us high-quality imagery we wouldn't usually have available. We then use algorithms

we've developed to produce an accurate measurement of the crown cover, which gives you a great figure for the five-hectare plot."

In tandem, an ecologist goes out on the ground to identify species at a site within the five hectares.

Jo says this process opened her eyes to just how biodiverse the landscape has become. She went with Fiamma Riviera and Angela Recalde-Salas, ecologists for Bush Heritage, who helped identify an enormous range of species.

"It was like having your brain exploded," says Jo of the fieldwork. "There is just so much more there than you thought."

Matt describes the IVCM method as scientifically rigorous, which is certified by Accounting for Nature.

The method was used to develop an Environmental Account (AU00067) measuring native vegetation under the Accounting for Nature® Framework, which was assessed by an independent Accounting for Nature® Accredited Auditor – RSM Australia – before being certified. The Asset Account

for Austin Downs achieved an Econd® (Environmental Condition Index) score of 76.4 out of a possible 100.

There's still plenty to be done at the property. As the family continues to care for the land, this baseline account will prove useful to help show what can be accomplished with a long-term, ambitious commitment to land restoration. •

In loving memory of Tom Jackson, whose dedication to caring for the land at Austin Downs will leave a lasting legacy. This work was funded by the landholder.

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Lightning response

Words by Kate Thorburn Location Bidjara Country, Queensland



The containment of two significant bushfires reveals how our investment in fire preparedness is paying off.

Photo September 2024 bushfire on Carnarvon Station Reserve, Bidjara Country, Queensland. By Alistair Hartley

"We've got a great

strategy in place to ensure

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assets safe."

In September 2024, having received the call that a fire had jumped the boundary into Carnarvon Station Reserve on Bidjara Country in central Queensland, Bush Heritage's National Fire Program Manager Rhys Swain packed his vehicle and headed to the reserve. Across Queensland, other members of Bush Heritage's experienced fire-trained staff did the same, each with their own 4WD equipped with an engine, pump, Personal Protective Equipment and up to 600 litres of water.

"Within 12 hours of a phone call, we had eight additional fire crews here with backup crews ready to come in and relieve," says Chris Wilson, Healthy Landscape Manager, who was already at the reserve, which is located in the Carnarvon Ranges, 200 kilometres south of Emerald. "Bush Heritage has invested

significant time and money in training our staff and building our internal capacity to fight fire," notes Rhys. "We've got an amazing depth of experience in our team and we're lucky to have that knowledge on the ground."

This deep understanding of the landscape and conditions at

Carnarvon proved critical over the next three weeks. The team contended with high temperatures, low humidity and hot southerly winds, all on the back of low winter rainfall, which had hampered the team's efforts to conduct prescribed burns prior to bushfire season. Not only did these conditions cause the fire to spread rapidly, but a few weeks after it had been contained, a lightning strike started another fire on the reserve's mountain ranges. In total, 31,000 hectares – approximately 50 percent of the reserve – burned.

In a Carnarvon first, our neighbours the Queensland Parks and Wildlife Service deployed firefighting aircraft that water bombed the more inaccessible areas, slowing down the fire and allowing time for us to complete critical firebreaks. Meanwhile, the fire fighters used bulldozers, loaders and graders to move burning logs and debris with ease, minimising human risk.

The aerial support and heavy machinery were both a result of close collaboration with Rural Fire Service Queensland and Queensland Parks and Wildlife Service. According to Chris, "It's an absolute game changer to have those sorts of resources on hand. It gives us more options to contain fire quicker."

The resources involved in fighting and preparing for fire are costly, from earth-moving equipment and aircraft to the huge amount of staff time and contractors required. As climate change is predicted to increase the frequency and intensity of fires, sustained investment is crucial for Bush Heritage to achieve its long-term goal of protecting Country.

"We've got a great strategy in place to ensure that our conservation targets are safe, and to keep our people

and our assets safe," explains Rhys. "Now, we're fighting landscape-scale fires and we're looking to make those decisions about bigger investments."

Post-fire, the benefits of strategic fire management speak for themselves. Two of Carnarvon's most fire-sensitive

vegetation communities – Brigalow Scrub and Semi-evergreen Vine Thicket – were spared from the brunt of the fires, thanks in part to historical fire scars built on over many years of prescribed burning. This is welcome news, as we wait for the final outcome of Bush Heritage's application to have Carnarvon declared a Special Wildlife Reserve by the Queensland Government. This designation would provide the highest-level of legal protection for the exceptional natural and cultural values of the reserve, such as the five endemic land snails found in the reserve's patches of Semi-evergreen Vine Thicket.

As Rhys puts it, successfully fighting fire and protecting the health of the bush comes down to being on the front foot. "We're keen to get in early on and build our capacity so we're ready for these events instead of being reactive." •

We gratefully acknowledge Queensland Parks and Wildlife Service and Rural Fire Service Queensland for their on-ground support during the fires at Carnarvon Station Reserve.

Wantiku tjuma (Women's story)

Words by Bee Stephens
Location Martu Country, Western Australia

A women-only ranger trip helps to keep Martu knowledge strong. Photo Knowledge is passed on and encoded during weaving sessions on Martu Country, Birriliburu Indigenous Protected Area, Western Australia. By Bee Stephens

A break in the wind lets Elder Annette Williams' voice carry across the red sand at Mangkili camp. "That's all the ladies sitting around who came on the trip ... we travelled from Wiluna, to Carnegie Station; we camped there, then we came here to Mangkili," she says, gesturing towards a painting being created by Martu women, who are on the first women-only Birriliburu Ranger trip, supported by Bush Heritage and Desert Support Services staff.

"This is the story about the ladies who came on the trip – it's about looking after Country and telling stories on Country and being strong," Annette adds.

The ladies have travelled a day's drive from Wiluna in Western Australia's arid centre to reach the southeast corner of the Birriliburu Indigenous Protected Area (IPA). The IPA represents 6.6 million hectares of native title land and comprises three central-west

desert regions – the Little Sandy Desert, Gibson Desert and the Gascoyne. Among the IPA's dunes and spinifex are the homes of threatened species such as **Tjakura** (Great Desert Skink), **Mantangalku** (Greater Bilby) and the Marsupial Mole.

Mangkili has long been a gathering place where people from all corners of the desert would come to camp, practice

culture, and deepen their knowledge of Country. Here, for tens of thousands of years, generations have passed on Martu people's complex understanding of how weather, plants, animals, humans, spirit and story interact.

With Martu knowledge, water and resources that sustain life can be found in abundance, even in a landscape that receives an average rainfall of 250-350 millimetres. While driving out to camp, we make a pit stop to energise ourselves using the old ways.

"It is late in the season, so grab the ones that are still flowering. Smack them on your palm and lick the wama that's left behind," explains Birriliburu Ranger Jennifer Morgan. We learn that wama is a sweet sticky treat, sourced from various plants, including **Yilyil** (Flame Grevillea) and **Kiyalkuna** (Desert Heath Myrtle). One of its main uses is to revitalise those travelling in the desert, which has been done for a very long time.

"One site in the south-west of the IPA shows evidence of occupation dating back 50,000 years. This is the earliest evidence of people living in Australia's sandy deserts," says Stella Shipway, Healthy Country Manager for Bush Heritage, who works with the Birriliburu Ranger Program to support the delivery of their Healthy Country Plan.

Martu are determined to keep their connection to the landscape strong. The Healthy Country Plan identifies ecological and cultural values that are vitally important to Country and strategies to keep these values healthy, which are informed by both Traditional

Knowledge and Western science. The ranger program then operationalises the plan through ranger trips to the IPA.

"Last year, two women Directors of the Birriliburu Land Management Company (governing body responsible for the land management of the Birriliburu IPA), expressed the need for a

women's trip. With an end goal of the young women rangers running the trips themselves, without Bush Heritage or Desert Support Services," explains Stella. "That is the ultimate goal of our work – to give enough support for Martu to take ownership of their ranger program and manage it."

In Martu community, women have distinct roles that contribute to everyday life. While these roles sometimes involve men, at other times, they're kept strictly separate to ensure knowledge is accurately encoded as it is passed down through different generations. Women play a significant role in the procurement of food, and, through this, have developed a complex understanding of the plant species found on their Country and how to care for them.

"That is the ultimate goal of our work, to give enough support for

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Since colonisation began, it has become increasingly challenging for Martu to practise and transmit their culture and knowledge to the next generation. "Knowledge came down from parents. I want to pass it on and on. That's very important. To share with girls who don't know," explains Elder and Senior Birriliburu Ranger Rita Cutter.

Rita has been on many ranger trips and was one of eight senior Martu women who conceptualised and lead the creation of the Birriliburu Bush Tucker book, another significant project helping to safeguard and fortify both cultural and plant knowledge.

The book, published in late 2023, was created with the support of many members of the Martu community, Bush Heritage staff and other partners. From sweet treats such as **wama** to the healing **Yipi-yipi** (Caustic Bush), the book details 63 Martu plants, their relevant cultural stories, where to find, and how to use them. Over ten years, content for the book was recorded and compiled through multiple trips, conversations and workshops.

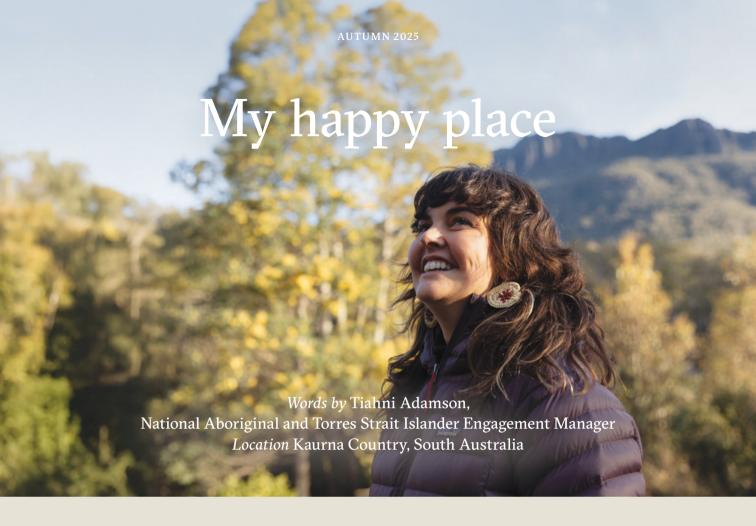
"There's a lot of knowledge of people, and contemporary connections to plants as well as ancient knowledge from the older generations," Stella says.

Martu say, "If Country is healthy, we are healthy." The benefits of this relationship extend far beyond the dunes of the Birriliburu IPA and are sustained by cultural knowledge, which community-led projects like the Bush Tucker book and ranger trips help to keep strong. •

We thank and gratefully acknowledge Mungarlu Ngurrarankatja Rirraunkaja (Aboriginal Corporation) RNTBC, Birriliburu Pty Ltd for their partnership and the Birriliburu Rangers and Martu community for inviting us to walk together to help heal country.



Photo Signs of healthy Country as Birriliburu Rangers find **Marlukuru** (Sturt's Desert Pea) in abundance, Martu Country, Birriliburu Indigenous Protected Area, Western Australia. *By* Bee Stephens



After spending time in my happy place, I no longer feel separated from nature – this 'other me' that modern life builds up dissolves. I go back to being one with Country.

Located an hour south of Adelaide on the unceded lands of the Kaurna people, Onkaparinga National Park and its waterways is my happy place in the bush.

At Onkaparinga Gorge, I slow everything down. I sit by its still water and practise what my Aunties and Elders taught me, "You have to let the animals get comfortable with you first, rather than always moving, wait for them to come towards you." After a period of stillness, birds, lizards, wallabies and, at the right time of year, Monarch Butterflies appear. I'm grateful for their soft and welcoming company, as I hope they are mine.

Then there's the river. Watched by old River Red Gums, I glide along the freshwater on my stand-up paddle board. The speed of my thoughts reflects the intentional dipping of my oar. I catch flashes of my silhouette, mirrored by the murky water that eventually runs clear as I edge closer to the ocean.

Where freshwater meets the sea, energy builds. The smell of salt dominates, darting gulls move in and out of my peripherals, and waves curl against the tide.

Now more than ever, people who care for Country and conservation are experiencing bouts of compassion fatigue and burnout. I combat this by spending time in my happy place, where I find connection, rest, reflection, rejuvenation and joy restorative tools needed for the work to keep Country healthy and protected.

Tiahni Adamson is a proud descendant of the Kaurareg Nations, a wildlife biologist, the 2024 Young South Australian of the Year, and has joined Bush Heritage as the National Aboriginal and Torres Strait Islander Engagement Manager. Keep your ears peeled for Tiahni as the host of our Big Sky Country podcast's next chapter, to be released later this year.

Photo Tiahni at Oura Oura Reserve, palawa Country, Tasmania. By Bee Stephens

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Bush Heritage is a conservation not-for-profit, grounded in science and culture to nurture all land for life. We work across millions of hectares, protecting and building resilience in our landscapes for the more than 2,000 animals and plants on Australia's threatened species list.

We respect, listen and learn from working side-by-side with Traditional Custodians, and by working in partnership with pastoralists and other organisations to deliver the most impact.

Our work would not be possible without the support of people like you. We gratefully acknowledge the estates of David White, Bruce D. Lindenmayer, Brian and Eileen Rigden, Marian Macmillan, Beth Miller, and the many other people who have recently donated to our work.

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Cover Photo The quiet Australian Pipit spotted among Climate-Ready Revegetation Research Project, Dja Dja Wurrung Country, Victoria. By Grassland Films

