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An aerial photograph of a vast coral reef system, likely the Great Barrier Reef, showing intricate patterns of green, brown, and blue water where the reef meets the ocean. The sky above is a clear, pale blue with some wispy clouds.

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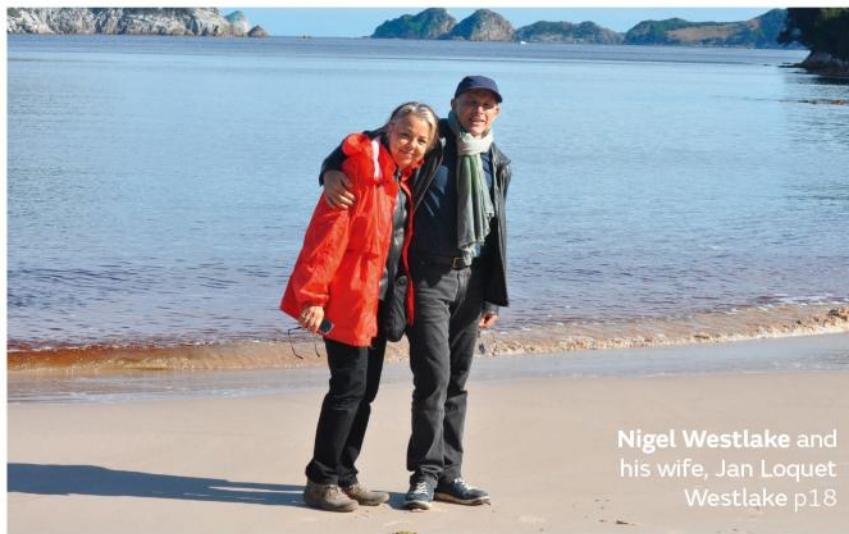
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Australian GEOGRAPHIC

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DONATE: Give to a project dedicated to conserving the world's largest fish, the endangered whale shark (p36).

GALLERY: Enjoy images of New Guinea's birds-of-paradise (p44).

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WIN: Enter to win a copy of the Australian Geographic Universal Atlas (p109).



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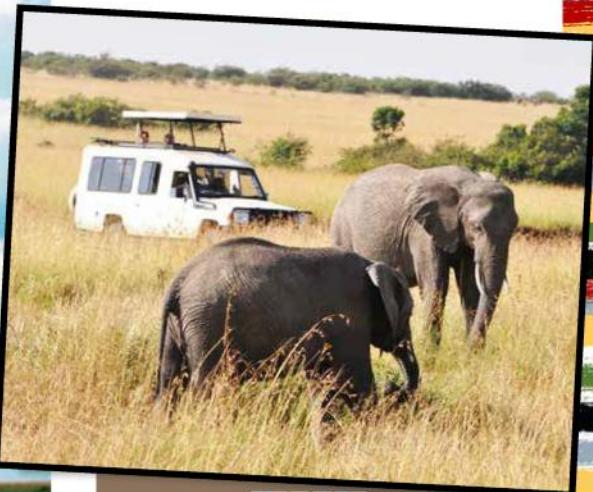
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On the cover



A three-hour, 6km round-trip bushwalk in Wooroonooran National Park in the Wet Tropics of Queensland World Heritage Area rewards the walker with a view of the spectacular Nandroya Falls. Here Douglas Creek plunges 50m down across a basalt parapet at the height of the wet season. Image by Travelscape Images / Alamy.



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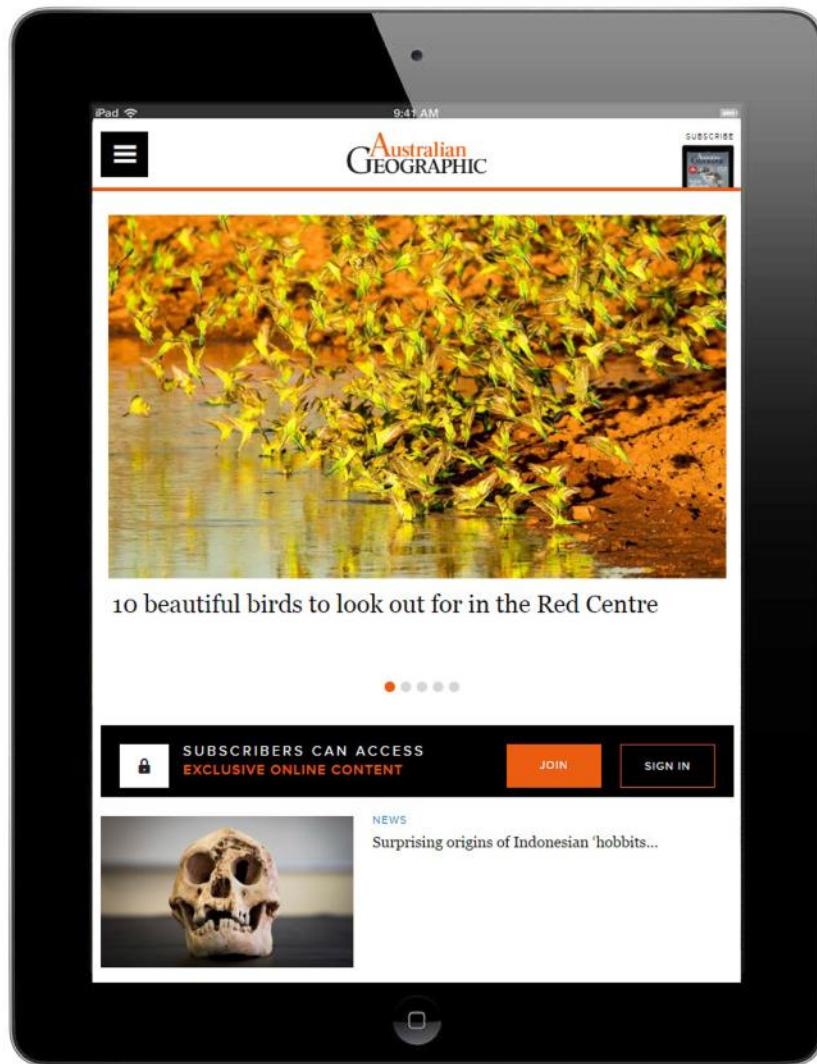
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Beyond the mystery



IT'S MORE THAN 80 years since the last known Tasmanian tiger died in Hobart Zoo in September 1936, but the mystique surrounding this officially extinct and peculiar Australian animal only grows. We all love a mystery and this one is as shrouded in mist as is its last-known stronghold, deep in the forests of the Tassie wilderness. Sightings of Tassie tigers, or thylacines, are fairly commonly reported but conclusive evidence is harder to come by, which only seems to fan the ardour of dedicated tiger seekers. In this issue we meet the passionate people who refuse to believe in the permanent demise of this sad emblem of European colonisation's destructive impact on Australia's native biodiversity.

That the Hobart Zoo couldn't save the hapless creature says more about a

fate already sealed than any shortcomings of the institution, but zoos have come a long way and today are bastions of animal conservation. They run ambitious breeding programs and play an essential role in educating the public. Zoos cooperate globally to assist species under threat and provide an important connection to nature in our increasingly urbanised society. Sydney's Taronga Zoo is a world leader in this area and its Taronga Conservation Society allows you to adopt a bilby or Tasmanian devil, which raises vital funds for breeding and research projects for these unique animals. We are excited to bring our readers an opportunity to participate in this program and receive a free gift from us as part of the adoption package. Taronga's ethos is about bringing the wild and people together for the common good and we share those values. See page 31 for details.

As we go to press, northern Queensland is reeling from the impact of Cyclone Debbie and northern New South Wales is still suffering severe flooding. Our cover story is about the delights of visiting far north Queensland in the rainy season. We encourage you to keep these destinations on your 'must-see' lists. Once the clean-up is done, they will need your support in so many ways and tourism is the lifeblood of many communities affected by this year's wild weather.

Chrissie Goldrick



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Contributors



Jeremy Bourke

is a career journalist who's written news, motoring, travel and even showbiz articles for newspapers and magazines. Now, as

a freelance writer and editor, he seeks out less-travelled roads and trails, particularly in mountainous regions. For his feature based in far north Queensland (see page 54), he sampled the rainforests south and west of Cairns during the Wet, when the power of the region's natural forces is at its greatest.



Ed Scholes

brings us insight on Australia's stunning riflebirds (see page 38) as no-one else can. This scientist, explorer and author is co-founder and leader of the Birds-of-Paradise Project at the Cornell Lab of Ornithology. He's been travelling to Australasia to locate, document and study these birds for nearly two decades. Along with photographer Tim Laman, he is the author of the book *Birds of Paradise: Revealing the World's Most Extraordinary Birds*.



Peta Burton

writes and photographs stories as she travels between Australia and India. In this issue she explores Darwin's famed Beer Can

Regatta (page 120). Peta has walked much of Australia for her 1000km/30-Day Trek Series; her book *The Ochre Cloak* was recently launched in the USA; and her documentary on the 40th anniversary of Cyclone Tracy, which devastated Darwin in 1974, was nominated for an Australian Commercial Radio Award.

More contributors: Steve Axford, Simon Bischoff, Brian Cassey, Sofia Charalambous, Professor Les Christidis, James Dorey, Don Fuchs, Doug Gimesy, Ken Griffiths, Dan Haley, Luke Hanson, Heath Holden, Mark Iommi, Darren Jew, Bob Kayganich, Dr Karl Kruszelnicki, Tim Laman, Jiri Lochman, Marie Lochman, Tim Low, Peter Meredith, Matthew Newton, Brad Norman, Olivia Page, Will Pringle, Samantha Reynolds, Mike Rossi, Ellen Rykers, Josephine Sargent, Ben Saunders, Roger Smith, Peter Solty, Andy Szollosi, Luke Tscharke, Dr Nathan Waltham, Fred Watson, Steve K. Wilson.

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Featured Letter

MODERN-DAY EXPLORER

The article on Dirk Hartog Island (AG 134) stirred fond memories for me. The following is an entry from the log of the captain of RAN Corvette HMAS Pirie: "16th January 1945 at 1145hrs Pirie dropped anchor in Turtle Bay."

I was a serving member of Pirie's crew. We had sailed north from Fremantle in exercises with US submarines USS Bashaw and USS Pampanito. At the end of the exercises we entered Shark Bay and anchored as above. That afternoon a party of us rowed our whaleboat ashore on Dirk Hartog Island. In my primary

school days in Sydney I had learnt about the Dutch navigator's exploits and particularly about Hartog's landing on the island and leaving an inscribed plate nailed to a post. Of course, there was no post or plate anywhere on this sandy, scrubby shore, but it was enough to have rowed ashore from a ship as Hartog had likely done, and stood where he had driven in his post. I still cherish the memory. Subsequently, in 1992, I came upon a facsimile of Hartog's plate in the Fremantle Maritime Museum. It was another special moment.

RON VICKRESS, GUYRA, NSW

TALL ORDER

Your issue with the tallest trees (AG 136) is delightful. Is any consideration being given to making the photo of the tallest tree available for framing and hanging? I have just the spot on my lounge room wall!

We have several tree photos. One is of the famous grass tree in the Flinders Ranges, which is so precious (the tree, not the photos) that the information centre won't tell anyone where it is. Another is a *Eucalyptus camaldulensis* just inside Rawnsley Park Station, also in the Flinders. I would dearly love to add your tall tree. Please consider making it available.

MARGARET WILLIAMS, MITCHAM, VIC

Steven Pearce says:

The poster is available for \$15 + postage online via our Tree Projects website. We'll also have posters available at our Canberra and Sydney shows. Please see details on our website: www.thetreeprojects.com/shop

OUT OF THE WAY

In AG 136, on the Your Say page, we were interested to read Graham Beneke's letter about Lappa Junction, south-west of Cairns. In June 2016 we were travelling with a group from

Cairns on our way to Chillagoe when our driver/guide stopped at Lappa (which we had never heard of until then).

The tin shed is now a little museum with the railway siding nearby. An old house with a modern car parked out front was the only other building there – maybe a caretaker residence?

Enclosed are some photos [below]. We always enjoy reading the magazine.

RON AND CAROLE PRITCHARD,
IPSWICH, QLD

FLIGHT MODE

Beautiful brood (AG 134), in responding to "Why lay eggs?" states, "Birds must be very lightweight to fly. Growing offspring in utero is weighty, affecting a



In Lappa Junction is an old railway station-cum-pub that now serves as a museum.



mother's ability to defend a nest and collect food." While that is true, I don't think it explains the question. All animals apart from mammals lay eggs. All animals tend nests and their young – some insects, arachnids, fish, reptiles and birds – expending time and energy. Birds are descended from dinosaurs, which laid eggs, but did not fly. The evolution of mammals allowed tending of the developing young to occur within the mother's body, freeing her from this inefficient use of her time and energy. So the laying of eggs is an earlier stage of evolutionary reproduction, which continues because it is a successful strategy, although superseded by mammalian reproduction methods.

ALAN MOSKWA, MAGILL, SA

POSTSCRIPT

On page 27 of the March–April 2017 (AG 137) edition of AUSTRALIAN GEOGRAPHIC, we erroneously stated that since the introduction of antivenom in 1956 there had been no known deaths from envenomation by a coastal taipan. According to the National Coronial Information System, there have been two recorded deaths over the past 16 years.



Apostles stormy sunset by Mark Iommi

It was a blustery spring evening at the 12 Apostles, the wind so strong in places it was difficult to stand. But the Apostles had been on my wish list for a while, so I found a reasonably sheltered spot on the southern viewing platform and set up my tripod.



Patternless delma by Peter Soltys

Known as the patternless or common delma (*Delma inornata*), this small reptile is a very fast and elusive lizard. Yes, you read correctly, it's a lizard, not a snake. It grows to a length of about 10cm and, unlike most other lizards, does not have functional legs.



New Holland honeyeater by Ken Griffiths

Southern Australia's New Holland honeyeater is one of our most common birds. During spring the species can form large, chattering groups that can be heard throughout the bush. I photographed this one feeding on a gymeal lily in the Royal National Park, NSW.

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GEO**buzz**

May · June 2017





Horse Head Rock

by Luke Tscharke

“A last-minute change in plans due to bad weather in Kosciuszko saw us head for the amazing rock formations near Bermagui, NSW. Waking up before sunrise, we walked along rugged rock shelves by torchlight to be greeted by the red glow of the pre-dawn sky. I’ve been here many times – and I run photography workshops here – but still find it hard to believe this rock has been carved out to form such a recognisable shape. Needless to say, we were happy with our backup plan.”

Dinkum fingo

The long paddock

THIS IS THE colloquial term for the great network of stock routes that crisscross the Aussie bush and outback. These are distinguished from regular tracks by being wider, with grass verges lining the edges. In times of drought, once all the home paddocks had turned to dust, stockmen and drovers would drive their cattle or sheep out along these stock routes and other roads to graze on the available green pick. The stock was said to be “on the long paddock”. It’s a practice that persists today.





Wild spirit

An encounter with the Tasmanian wilderness inspired a powerful new orchestral work by acclaimed Australian composer Nigel Westlake.

Story by Chrissie Goldrick

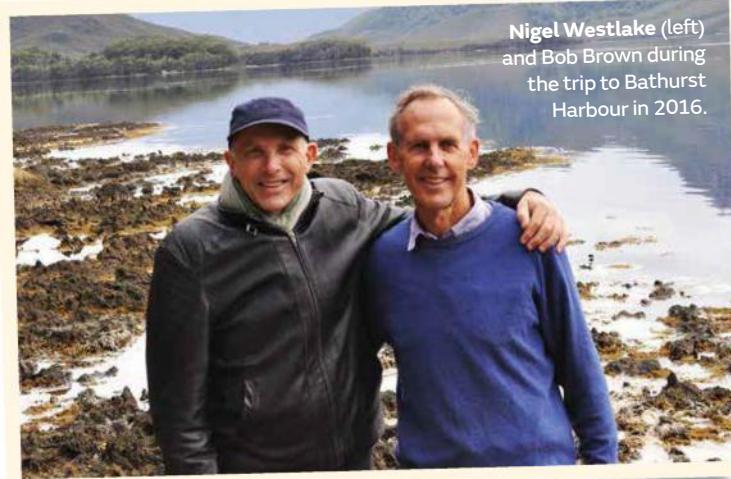
OUTSIDE THE gleaming shells of the iconic Opera House, Sydney Harbour's frenetic evening rush hour is in full swing. Packed ferries churn the water as they come and go, whisking commuters to their home suburbs. Little yellow water taxis weave in between as a colossal cruise liner slips its moorings, does an elegant pirouette and steams up Port Jackson towards its next destination.

Inside, in the concert hall, which seats more than 2000, the spirit of a very different harbour is being evoked through the dazzling artistry of virtuoso oboist Diana Doherty and the Sydney Symphony Orchestra under the baton of maestro David Robertson. The capacity audience is spellbound as Diana plays through the work's four contrasting movements. Her technical mastery on full display, she moves into the final climactic section after which the audience springs to its feet in rapturous applause for an extended standing ovation. It's the premiere performance of *Spirit of the Wild*, a new oboe concerto by renowned Australian composer Nigel Westlake, and, as the man himself steps up to take a bow, the applause rises into a cacophony of

whistles, foot stamping and cheers.

This new composition grew from an unexpected 2016 visit by Nigel with environmentalist Bob Brown to remote Bathurst Harbour in Southwest National Park, in the Tasmanian Wilderness World Heritage Area.

Nigel was already exploring ideas for a new work with Diana, but the impact of Bathurst on him was profound. "My introduction to this place of exquisite beauty became the backdrop to my next project – an oboe concerto commission for the Sydney Symphony," Nigel explains. "As I pondered the ensuing collaboration with Diana, the memories and significance of my expedition with Bob continued to infuse my



Nigel Westlake (left) and Bob Brown during the trip to Bathurst Harbour in 2016.

consciousness, leaving their fingerprints on the concerto score in subtle and mysterious ways."

He was in Hobart when Bob invited him to Bathurst Harbour. The two had met at a conference where both were guest speakers. "A few months later I was conducting the Tasmanian Symphony Orchestra and offered Bob some tickets, but he said he'd already booked and was bringing all the family – and, by the way, what was I doing the day after?" Nigel recalls. The next day, a small group of musicians and environmentalists flew into remote Melaleuca, from where they explored the pristine, tannin-stained waterway of Bathurst Harbour, its button grass moors, windy



In the shadow of Mt Rugby (above), low-growing native shrubs thrive along Bathurst Harbour's shoreline, staining its waters golden brown.

The oboe seems ideal for a musical evocation of such windswept wilderness.

heathlands and breathtaking mountain vistas. "You get a feeling of exposure and danger, and the elements are all laid out in front of you," Nigel says. "It's like you are literally at the end of the earth. And, of course, we had Bob there shepherding us through these beautiful walks, talking the whole time about the flora and fauna and the way the Aboriginals used to live here. His

passion, knowledge and love of the area are so infectious, and that's what I really took away from the trip."

The challenging concerto intersperses brisk dynamic sections, reminiscent at times of wild bird shrieks and calls or the howl of gales, with quieter, expansive moments reflecting the area's solitude. The woodwind oboe seems ideal for a musical evocation of such

windswept wilderness. Nigel hopes *Spirit of the Wild*, which he describes as a hymn to nature, will inspire others to value our natural legacy.

"My trip to Bathurst Harbour reminded me of the preciousness of the wilderness and of our propensity to be subsumed by materialism," he says.

"We neglect our connection to country and the wonders of the natural world, choosing instead to value only those elements of our environment that can be quantified by monetary worth. Such wild places are truly priceless and we exploit and destroy them at our peril."

FOR DETAILS of where you can next experience *Spirit of the Wild* see The List, p108.

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Infographic

Web and flow

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ARE UPLOADED

4,167,000
FACEBOOK LIKES
ARE GENERATED

About 7%
of the world's
population
2000:
414 million

x1
 **Naked eye**
Rising in the eastern evening sky is the teapot of Sagittarius, tilted over and standing on its 'handle'. To its left is a bright 'star' easily outshining the members of this group. It is the planet Saturn. You will need a small telescope to see its famous rings.

**IN ONE
MINUTE
ON THE
INTERNET**

154,131,000
EMAILS ARE SENT

4,101,000
YOUTUBE VIDEOS ARE VIEWED

46,000
PHOTOS ARE UPLOADED
TO INSTAGRAM

149,000
SKYPE CALLS
ARE MADE

452,000
TWEETS ARE WRITTEN

About 46%
of the world's
population
2016:
3.5 billion

2010:
2 billion
2005:
1 billion

**NUMBER OF INTERNET
USERS WORLDWIDE**

2000

2005

2010

2016

looking up with Glenn Dawes

Glenn Dawes is a co-author of the yearbook *Astronomy 2017 Australia* (Quasar Publishing).



x10
 **Binoculars**
Each day the Moon occults – obscures – many stars, by passing in front of them. This is usually very faint. But on 4 May, the bright star Regulus winks out behind a dark lunar limb: best viewed from eastern states and disappearing about 8pm EST.

x100
 **Small telescope**
Above Sagittarius is the distinctive constellation Scorpius, the Scorpion. Below the 'stinger' of its tail lie two hazy patches, which are open star clusters. M7 is more obvious, clearly larger and composed of brighter stars compared with its companion M6.



Australian Geographic Society

STUDENT SCIENCE

The AG Society is offering two schools the opportunity to track whale sharks around the globe.

AUSTRALIAN WHALE shark research organisation ECOCEAN is exploring the mysteries of whale shark migration. From May to August, it will be deploying satellite tags on sharks in Ningaloo Marine Park for its second Whale Shark Race Around the World, which will search for clues on where these huge fish breed. Each shark will be assigned to a participating school and its journey displayed on the ZoaTrack website, www.zoatrack.org. In conjunction with our fundraiser (see page 36),



Satellite tags deployed on whale sharks by ECOCEAN researchers are so small they're barely noticed by the huge fish they track.

the AG Society is sponsoring two schools from anywhere in Australia to enter the Race. This usually costs \$5000 and has previously been limited to West Australian schools that fundraise for the privilege. For more information and how to enter your school for a chance to join the Race, see www.australiangeographic.com.au/whalesharks



BY THE NUMBERS

23,677 SQ.KM

The size of Anna Creek Station in South Australia. This cattle farm is the biggest in the world and at its current size is larger than many countries.



Ask an expert

Dr Nathan Waltham, freshwater ecologist, James Cook University

Q

Why do crabs walk sideways?

A

Crabs can be found in marine habitats, such as mangroves and rocky shore platforms, as well as freshwater rivers and creeks. In fact, some migrate between marine and freshwater to complete life cycle stages. They are remarkable animals in many ways but perhaps most notably because they do walk sideways. Because we humans have forward-bending knees, we step forwards to walk. However, crabs have legs on the sides of their body, and it is because their knees bend outwards that they walk sideways. Having outward-bending knees on their sides allows crabs to flatten their bodies.



NEED
TO KNOW



with Dr Karl Kruszelnicki

Just one tide a day

THE TOWN OF Karumba – at the Gulf of Carpentaria's bottom right-hand corner – experiences only one high tide and one low tide each day. What's going on?

The gravitational forces of our moving Moon and the Sun attract Earth's oceans and suck them into corresponding watery bulges. The normal rotation of our planet brings any point on Earth's surface towards, under, and then away from these bulging walls of water. This gives the impression of tides – the ocean rising and falling.

But the situation is actually more complicated. The Moon doesn't orbit directly above the Equator, but instead swings above and below it. The oceans have different depths, continents have odd shapes and get in the way of the bulging water. The Earth is

tilted some 23° from the vertical; the Earth spins every 24 hours while the Moon takes a month to loop around our Earth; water is slowed by friction as it

moves across the ocean floor – and there are a lot more confounding issues.

When you factor all this in to the equations, you get about 120 different possible tides each day. There are tides that happen once a day, twice a day, three times a day, four times a day, and so on. But the twice-a-day tides, which have the biggest energy and height, are most common.

In the Gulf of Carpentaria, most of the tidal energy comes from the Indian Ocean. Hardly any gets through the little 150km gap between Cape York and New Guinea. So the Gulf is virtually a closed body of water.



It takes 12 hours for a water wave to slosh across the Gulf of Carpentaria from east to west – and another 12 hours to bounce off and come back. This 12-hour period is (coincidentally) the same as the time between two high tides (or two low tides). In the Gulf, the incoming tides 'cancel out' the outgoing tides, so there are no twice-per-day tides.

Now, the next most energetic tides are the once-a-day tides. And that's why you have only one tide a day at Karumba. A single tide each day happens for exactly the same reason in the Gulf of Thailand, the Persian Gulf and the Gulf of Mexico.

DR KARL is a prolific broadcaster, author and Julius Sumner Miller fellow in the School of Physics at the University of Sydney. His latest book, *The Doctor*, is published by Pan Macmillan. You can follow him on Twitter: @DoctorKarl.

Ask an expert

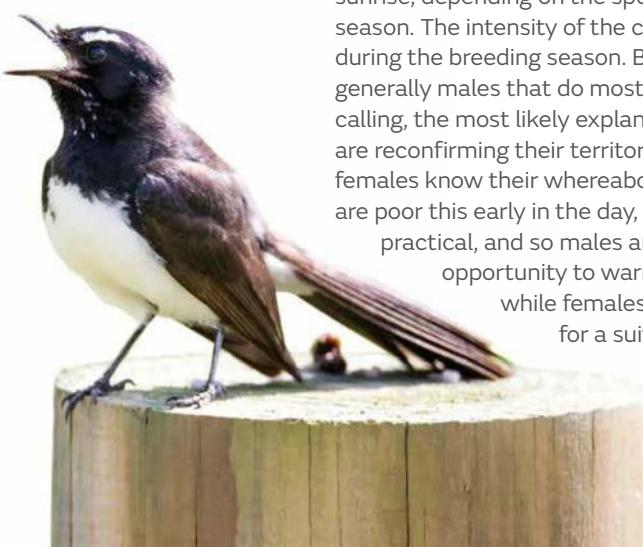
Professor **Les Christidis**, one of the world's leading experts on Australian birds, Southern Cross University

Q

Why do birds sing at sunrise?

A

A number of explanations have been put forward to explain the 'dawn chorus', when birds are at their most vocal. The dawn chorus can start at different times, usually 30–90 minutes before sunrise, depending on the species of bird and season. The intensity of the chorus is loudest during the breeding season. Because it is generally males that do most of the singing and calling, the most likely explanation is that they are reconfirming their territories and letting females know their whereabouts. As light levels are poor this early in the day, foraging is not practical, and so males are taking the opportunity to warn off rival males while females are listening out for a suitable mate based on song quality.



On this day

24 May 1930



AFTER 19 DAYS of flying, 26-year-old British aviator **Amy Johnson** touched down in Darwin to world acclaim – the first woman to fly solo from England to Australia. Born in Hull, England, on 1 July 1903, Amy's interest in aeroplanes began just two years before her record-breaking flight to Australia. And it was only in 1929, a year before this epic journey of almost 16,000km, that she was awarded her flying licence, after 85 hours of flying training – mostly through the London Aeroplane Club. Before that, Amy hadn't even flown over the English Channel. And yet, convinced that women could be as proficient at flying as men, she set off on her own from London in her DH Gipsy Moth on 5 May 1930 to fly halfway around the world and into the record books.

Life on the edge

This little lizard survives its time in the sun by operating at the very limit of thermal tolerance for a vertebrate.

WHEN I recently visited the Australian Age of Dinosaurs museum in central Queensland, the temperature hit 42°C. Shade offered little sanctuary, but exposure to direct sun, where the conditions were up to 10°C higher, was potentially lethal. Yet this tiny, smooth-snouted earless dragon (*Tympanocryptis intima*) chose to bask in full sunlight on a black metal chain atop a concrete post. For me the chain was too hot to touch for even a few seconds. By careful posturing and

strategic colouration a baby dragon like this, with a head and body length of just 2cm, can avoid cooking in conditions that would kill anything else. Those skinny legs are holding its body high off the hot metal, while its white underside helps deflect heat radiating from below. I'm not sure why it wasn't tucked away under a shaded stone. There was no available food, and it was too hot even for ants. And it was probably too young to have a territory that needed guarding.

STEVE K. WILSON





PHOTO CREDIT: BRIAN CASSEY

Andy Ridley

Reef crowd-puller

A childhood fantasy turns into a global initiative as the citizens of the world join forces to save our Great Barrier Reef.

AS A SMALL BOY in Norwich, England, Andy Ridley (pictured left) dreamt of an underwater world so vibrant, so full of life, it couldn't possibly exist. But decades later, a grown-up Andy found it in real life – and his underwater fantasy world turned out to be even bigger than the UK.

The Great Barrier Reef (GBR) is 344,400sq.km and is so large it can be seen from space. As one of the world's most famous marine landmarks, it has a notoriety that makes it perfect for mobilising crowd power to save it. And that's exactly what Andy aims to tap into. As CEO of the fledgling Citizens of the GBR initiative, he wants ordinary people around the world to play a part in protecting this famed habitat, which is suffering from yet another widespread bleaching event.

It's not the first time Andy has taken on such a gargantuan task. He co-founded Earth Hour (EH), which involves people and businesses turning off their lights for the same hour each year. Launching in Sydney in 2007, the movement saw 2.2 million of the city's residents participating. By 2014, when Andy moved on, EH was in 7000 cities, across more than 160 countries, reaching a global audience of billions. It aims to encourage people to think about their environmental impacts and individual footprints and the GBR project is looking to follow suit.

"The Great Barrier Reef is a mirror on humanity – the health of the reef reflects how we're treating the planet," Andy says. "I was working in the Netherlands and I started to see the stories about what was going on in the reef. Since I was knee-high to a grasshopper, I've been in love with the

reef and I wanted to see what was really going on and how serious, or not, the issues were."

So, in 2002, Andy, his zoologist wife, Dr Tammie Matson, and their two young children, Solo and Shepard, left the bright lights of Europe for a life under the stars in Cairns.

Andy, now 46, says one of his most magical reef encounters was on an early trip to Osprey Island. "I'd never seen anything like it," he recalls. "It was teeming with life, extraordinary." After this memorable dive Andy imagined how he could use the reef to spark change, and the Citizens of GBR was born. The project will be launched officially in July, although you can become involved now (see below).

Whether you're a child growing up in a New York apartment or a grandfather living in Beijing, anyone can register as a 'citizen' and have a say in how the GBR is protected. Registration will entitle you to vote online on which projects the initiative funds and be kept updated on the outcomes.

"It's a big task – a big part is to learn more about the global issues, like climate change and pollution, and how we need to dramatically change the way we're living in the world," Andy says. "How do we use this as an opportunity to educate? The reef is a canary in the coalmine but we hope it's a rallying point." The rise of technology, he says, allows for unlimited social reach like never before: "We're thinking these issues are a daunting problem but they're an opportunity for us all."

JOSEPHINE SARGENT

 **SIGN UP** now to become a Citizen of the GBR at www.citizensgbr.org

TOP 10

Oldest continuously living things in Australia

The average human life span of 82 years is a mere blip in time compared with these long-lived entities.

BY ELLEN RYKERS



Stromatolites at
Shark Bay, WA.

FROM ANCIENT trees to primitive cyanobacteria, Australia's landscapes and seascapes are home to some exceptionally old living things. There's something about long-lived beings that surprises, delights and humbles us. Perhaps it's the countless perils they have endured or the stupendous stories they would tell (if they could talk). Or perhaps it's simply that they illuminate a slower way of existence. Our list of 'oldest continuously living things' includes both individuals and clone clusters – genetically identical plant colonies descended from a single continuously living organism.

1 ORANGE ROUGHY
Hoplostethus atlanticus
140 years

These deep-water dwellers, which spawn around seamounts off southern Australia, are among the world's longest-living fish. Their ear bones suggest they can live for more than a century, during which they can reach the size of an average newborn human. Like many cold-water species, orange roughy are slow-growing, not reaching maturity until 20–40 years of age, making them particularly vulnerable to over-fishing.

2 THE GRANDIS
Eucalyptus grandis, 400 years

An exceptional flooded gum specimen, nicknamed The Grandis, towers above the lush forest of Myall Lakes National Park, north of Newcastle in NSW. Tilt your head to admire the tree's crown, where hollow branches provide penthouse homes for birds and arboreal mammals. It's not only old but also the tallest known tree in the state. The Grandis impresses with its superlative dimensions – an 11.5m circumference at its base and height of more than 75m.

3 THE KAURI TWINS
Agathis microstachya, 900 years

Rising from the shores of Lake Barrine in Crater Lakes National Park, Queensland, are these two giant rainforest pines, Australia's largest conifers, which have occupied this lakeside spot for almost a millennium. Over that time, they've grown from seedlings to their present-day 50m height and 6m girth. Kauris once dominated Queensland's ancient rainforests, but this species is now restricted to the Atherton Tableland. Today's kauris appear virtually unchanged when compared with 300-million-year-old kauri fossil specimens.



4 BOAB PRISON TREES
Adansonia gregorii
500–2000 years

The barrel-like trunks of boabs, icons of the Kimberley, become hollow with age and at least two are reputed to have served as short-term prisons. One, near Derby, is thought to be 500 years old, and, despite its roomy 15m girth, has probably never been used as a lockup. But the Wyndham prison boab, estimated to be 1500 years old, was known as the Hillgrove Lockup. In the 1890s Aboriginal people were reportedly imprisoned in the tree – or chained outside – on their way to sentencing in the nearby town.

5 STROMATOLITES
Cyanobacteria, 1000+ years

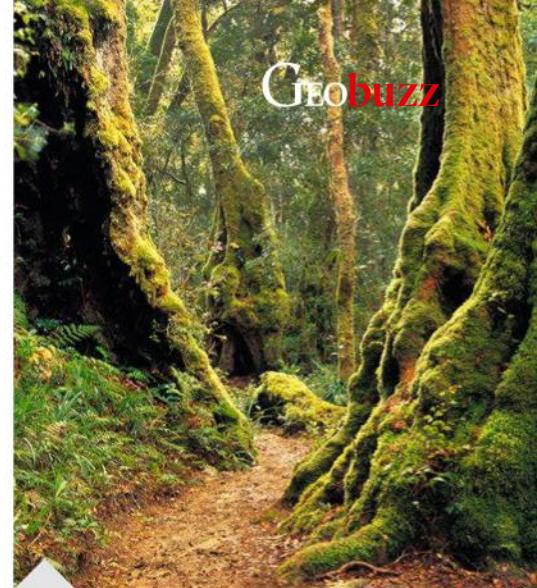
These cowpat-like lumps are portals through time. Stromatolites are built up, layer upon layer, over millennia by tiny cyanobacteria – microorganisms that were among Earth's earliest life forms, dating to 3.5 billion years ago. Until 1961, we only knew of stromatolites from ancient fossils. A few colonies have now been found across WA, but the most famed at Shark Bay (see opposite) is thought to be as old as 1250 years.

6 MEELOUP MALLEE
Eucalyptus phylacis, 6600 years

The Meelup mallee is known from a single ridgeline south of Perth. There 27 genetically identical shrubby trees – each up to 5m tall and together comprising a single clone – cluster across an area smaller than a rugby field. Experts believe this clone, which resprouts after fire, may be 6600 years old. This population once had more Meelup mallees, but a scenic lookout was built in the middle of their range, destroying an unknown number. When the mallee's significance was realised, the lookout was removed.

7 HUON PINES (left)
Lagarostrobus franklinii
10,000 years

Huon pines are endemic to Tasmania's damp forests. On the northern edge of the West Coast Range, a strange stand of these trees decks the slopes of Mt Read. All are male and genetically identical. Living individuals may be older than 1500 years and likely to have descended from a single ancestor that's been propagating vegetatively for millennia. Ancient pollen samples suggest this clonal organism has been continuously inhabiting Mt Read for at least 10,000 years.



8 ANTARCTIC BEECH
Lophostozonia moorei
2000–12,000 years

Gondwana relics, Antarctic beech soar above the cool tablelands of northern NSW and southern Queensland, in World Heritage-listed rainforest. These ancient trees can reach 40m high – but their lifespan is even more impressive. Specimens more than 2000 years old line walking tracks in Springbrook National Park. In Lamington NP, contemporary artist Rachel Sussman tracked down a 6000-year-old tree and a 12,000-year-old clonal stand.

9 MONGARLOWE MALLEE
Eucalyptus recurva
3000–13,000 years

Also known as the 'ice age gums', these incredibly rare eucalypt shrubs literally fall short of the towering trees on this list when it comes to stature. But one of these understated bushes may be an astounding 13,000 years old and another perhaps 3000 years old. The species is also one of Australia's rarest eucalypts. There are a grand total of five Mongarlowe mallee shrubs growing across four distinct sites on the NSW Southern Tablelands.

10 KING'S LOMATIA
Lomatia tasmanica, 43,600 years

In a remote pocket of south-western Tasmania, about 500 separate King's lomatia plants grow. All, however, are clonal, have three sets of chromosomes and are sterile. They reproduce vegetatively: when a branch drops, it grows roots and becomes an individual (but genetically identical) specimen. Fossilised leaf fragments found nearby have been dated to 43,600 years ago, and scientists believe these are genetically identical to modern specimens. This suggests King's lomatia may have been continuously growing since the Stone Age.

The final junkyard

...where a floating space debris problem is growing.

MORE THAN 50 YEARS of human space exploration has resulted in a potentially hazardous band of debris orbiting Earth. Travelling at more than 28,000km/h, this space junk is a growing problem. There are about 500,000 pieces of debris currently in orbit that are each bigger than a marble – meaning they’re large enough to be tracked – and countless smaller ones, each of which could damage crewed spaceships or valuable satellites. Possible solutions include proposals to drag debris down with magnetic nets or lasers. So, what sort of junk is out there?

The oldest piece of space junk orbiting Earth is the **Vanguard 1**, the USA's second satellite, which was launched in **1958**.

Scientists estimate there are nearly **100,000** objects larger than **5cm** in Earth's orbit.

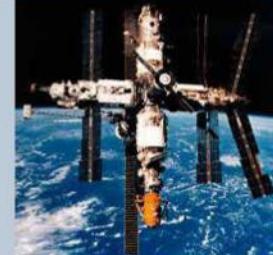
Most space junk is derelict satellites, debris from collisions of large pieces of space junk and stuff left behind from astronauts, such as faecal matter and **clothing**.

Most orbital debris resides within about **2000km** of Earth's surface.

Any debris higher than **1000** kilometres will continue to orbit Earth for a century or more.

28,000 km/h

In 1965, during the first US spacewalk, Gemini 4 astronaut Edward White lost a glove. For about a month, it remained in orbit with an estimated speed of



More than **200 OBJECTS**, most of which were bags of rubbish, were released by the Mir space station during its first 10 years of operation.

In 2007 China blew up an old weather satellite with a missile, creating more than **3000 pieces** of debris in an instant.



A saltwater crocodile called Sweetheart

At the Museum and Art Gallery of the Northern Territory

HE MIGHT BE long-dead and well-stuffed, but Sweetheart is a formidable sight. With giant gaping jaws and a 5m-long body, his lifelike appearance is testament to the capabilities of skilled taxidermy.

Sweetheart is an NT icon and famed as the largest stuffed saltwater crocodile on display in Australia. But his reputation really begins in the 1970s, when he was a wild croc with a nasty reputation for terrorising boaties and fishers. Back then he patrolled a billabong south-west of Darwin called Sweets Lookout – a popular fishing spot and the source of his nickname.

Sweetheart took a dislike to dinghies and became notorious for attacking

outboard motors – he was probably defending his territory, because the engine sound mimicked the rumbling vocalisations of rival males.

In early 1979, after a couple of close encounters during which dinghy occupants were tipped overboard, parks and wildlife authorities decided Sweetheart should be relocated to a nearby crocodile farm – not an easy task with the hostile reptile weighing in at an impressive 780kg. And so on 19 July that year, Sweetheart was trapped and tranquillised. But sadly, as he was being hauled ashore, he became entangled in a sunken log and drowned. At an estimated 50 years of age, Sweetheart's reign as top croc of the

billabong came to an untimely end – but his second life as a museum specimen began soon after.

Taxidermists at the Museum and Art Gallery of the Northern Territory completed the mammoth task of preparing Sweetheart's skin and skeleton in September 1980. During the tricky process they discovered the remains of pigs, barramundi and long-necked turtles in his stomach but, thankfully, no humans.

After a year-long national tour, Sweetheart returned to the NT where he's remained ever since. Four decades on, visitors continue to marvel at this remarkable animal, and the reputation of another Darwin legend endures.

THEN AND NOW

Do you recognise this iconic street pictured in 1940 and 2015? Clue: It's in the heart of Australia. Turn to page 129 for the answer.





SPACE

Galaxies on the turn

Researchers uncover a new spin on ancient dark matter to reveal a 'smoother' universe.

HOT ON THE HEELS of our story in AG 137 about the slowdown of Earth's rotation comes another discovery about cosmic spin – but this time on a vastly different scale. And it sheds light on the early history of the universe.

Most people understand that when we look out into space we also look back in time because the light emitted by celestial objects takes time to reach us. We're always seeing things as they were in the past. Among other things, this gives us the possibility of comparing similar objects at different periods in the universe's history, by observing nearby and distant examples. And that's exactly what researchers at the Max Planck Institute for Extraterrestrial Physics, in Germany, have now done.

Their subjects are spiral galaxies – gigantic swirling collections of stars, gas and dust that are often spectacularly beautiful. Our understanding of them took a great leap forward in the 1970s, when it was realised they must have an invisible component holding them together – otherwise, their outer regions would fly off due to their speed of rotation. This invisible component reveals itself only by its

gravitational pull, and is known to astronomers as 'dark matter'.

Since then, we have learnt a great deal about dark matter, which we now know accounts for about five-sixths of the matter in the universe. We know it must be made of vast quantities of some as yet unknown subatomic particle, and that today's galaxies sit in the middle of dense clumps of it. But the surprise of this new research is that in the distant past – 10 billion or so years ago – things were different. By analysing the rotation of galaxies in this early phase of the universe, the researchers have found that they didn't have their own individual dark matter cocoons. It looks as if dark matter, while not absent in the early universe, was much more smoothly distributed than it is today. It's puzzling that dark matter didn't become clumpy until after the first galaxies had formed – an unexpected result.



FRED WATSON

is an astronomer at the Australian Astronomical Observatory.

Research shows massive star-forming disc galaxies in the early universe (at right) were less influenced by dark matter (shown in pink) than in the present day (at left) because it was less concentrated.

FRED ANSWERS YOUR QUESTIONS

How do you measure light-years?

John Barbour, Cowra, NSW

This is a great question and conjures up images of astronomers with stopwatches timing light beams as they fly through space. Of course, that's not how it works. In fact, astronomers don't even use light-years in their day-to-day work. The units of distance they do use – called 'parsecs' – are measured by the slight change in the apparent direction of a star as the Earth moves in its orbit around the Sun. That change is known as parallax, and one parsec is the distance at which a star has a parallax of one second of arc – a tiny angle amounting to $1/3600$ of a degree. Just for the record, one parsec is 3.262 light years.

If you have a space question for Fred, email it to editorial@ausgeo.com.au



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NATURE WATCH

Coral reef scene

Three-quarters of the world's 798 coral species can be found on Australia's Great Barrier Reef, and they come in a huge variety of shapes, sizes and colours.

STORY BY SOFIA CHARALAMBOUS ILLUSTRATION BY ROBERT KAYGANICH

THERE ARE MORE than 600 coral species in the Great Barrier Reef (GBR) Marine Park, which covers 344,400sq.km of ocean. Corals are colonies of tiny polyps, which are animals related to sea anemones and jellyfish. A reef begins when a polyp attaches to a rock on the seabed and divides into clones. These connect, creating a colony that functions as a single organism.

Corals are either hard or soft. Hard corals, which have polyps that produce a calcium carbonate skeleton to protect and support them, are building blocks for reefs. Soft corals are flexible and lack a solid skeleton; they are instead supported by microscopic, spike-like 'spicules', designed to deter predators such as fish.

Hard corals have a symbiotic relationship with zooxanthellae algae, which provide them with food and colouring. High water temperatures cause this relationship to break down; the zooxanthellae are expelled by their host corals, and the corals starve and turn white in the phenomenon known as bleaching. Surveys carried out by the GBR Marine Park Authority and Australian Institute of Marine Science show that in 2016 more than 60 per cent of the GBR was severely bleached, leaving 22 per cent of corals dead. It was the worst damage to the reef yet recorded and raised questions about Australia's environmental stewardship.

The coral species illustrated here are all found in the outer reef at Heron Island, at about 1–3m depth, as well as in other shallow reef zones of the GBR.

2

TABLE CORAL

Acropora cytherea

Size: Up to 3m across

Table coral is a hard, stony coral that grows horizontally in wide, flat, table-like formations that are thin and finely structured. The 'tables' are made up of lots of short, cylindrical branches that grow outwards and link together in the centre of the plate, forming a mass of solid, joined branches. Found on shallow reef slopes and lagoons in tropical environments at depths of 3–25m.

1

FINGER CORAL

Montipora digitata

Size: Up to 40cm across

A stony, reef-building coral that grows in either hand-like or tree-like colonies, with blunt, upright branches. It is covered in very small corallites that give it a rough, sandpaper-like texture. Like most other hard corals, it gets its energy from both the zooxanthellae that live within its tissues, as well as active carnivorous feeding. Found in shallow reef environments and mud flats.

3

HONEYCOMB CORAL

Diploastrea sp.

Size: Domes of 1m or more

Like many other hard corals, honeycomb coral has a common name that describes exactly what it looks like. It grows in a large dome shape and is covered in a skeleton of corallites – the individual calcium carbonate cups in which polyps sit. These are packed closely on the surface in a honeycomb pattern. Inhabits all reef environments to a depth of 20m.

1

2

3

4

4 COMMON MUSHROOM CORAL

Fungia fungites

Size: Up to 28cm across

Unlike most corals, does not form colonies.

Mushroom corals are large, free-living, solitary polyps that aren't attached to the substrate. They are flat or dome-shaped with wide, slit-like mouths. Young mushroom corals begin life on stalks and bear a striking resemblance to actual mushrooms. Found in shallow areas on the reef crest and flat, but mostly within cavities on the reef flat.

5 ORGAN PIPE CORAL

Tubipora musica

Size: Up to 1m across

Most soft corals have limestone spicules that provide some structural support by slightly stiffening the soft tissues. In organ pipe coral, the spicules fuse to create a hard skeleton of pipe-like tubes, with each single polyp bearing eight feathery tentacles. Colonies of organ pipe coral can occupy large patches of reef. Inhabits shallow waters down to about 12m.

7 HUMP CORAL

Porites densa

Size: Up to 15cm across

Common in shallow inner reefs, but also found less frequently on the outer reef. This small, stony coral grows in a rounded hump shape. It prefers to grow in the absence of other species, although it can occasionally be found near algae or other corals. It uses symbiotic algae to photosynthesise by day and filter feeds on plankton by night.

8 SMOOTH CAULIFLOWER CORAL

Stylophora pistillata

Size: Up to 30cm across

Common in shallow reef areas, particularly those that are exposed to strong wave action, although it can occur to a depth of about 15m. It is a hard, branching coral with blunt, slightly flattened ends. Colour ranges from cream, pink or blue to greens.

6 FLOWERPOT CORAL

Alveopora sp.

Size: Polyps can grow up to 10cm long and 2cm wide

Flowerpot corals are made up of many individual polyps joined together at the base of their skeletons to form branches, columns or dome-shaped colonies. The individual polyps are highly flexible and active, and constantly moving around and feeding. Their colonies can spread widely, growing many metres across. Found in upper reef slopes with low wave action, 5–25m deep.

6

7

8

Wild Australia



MAY · JUNE 2017

Essential wildlife highlights that can't be missed



SA CUTTLEFISH MIGRATION, WHYALLA

Each May–August, thousands of Australian giant cuttlefish (*Sepia apama*) gather to spawn along False Bay's rocky coast. Glimpse males in a dazzling courtship display, rapidly changing the colours and patterns of their skin. There is boardwalk access at Stony Point and a stairway at Black Point. **More info:** Call Whyalla City Council on 08 8640 3444 or visit www.whyalla.sa.gov.au



Wild Australia
with John Pickrell

 Big picture

Rain response

By Steve Axford

“These exquisite, short-lived life-forms appeared after heavy rain, as so many mushrooms do, in Nightcap NP, NSW. I’ve long been fascinated by the beauty of these gems of the living world and the critical role they play in nature. Mushrooms are the fruiting bodies of fungi, which often live underground or in dead wood. They emerge when temperature and moisture levels are just right – in many regions of Australia, that occurs in autumn, except in the tropics where it occurs in summer.”



VIC WHALE WATCHING, WARRNAMBOOL

During winter months, Logans Beach at Warrnambool on Victoria’s southern coast transforms into a southern right whale (*Eubalaena australis*) nursery. Mothers migrate from the cold waters of Antarctica to the comparatively warmer coast of southern Australia to give birth to calves. To spot them for yourself, visit the viewing platform at Logans Beach or join a whale-watching boat tour.

More info: Call Warrnambool Visitor Information Centre on 1800 637 725 or visit www.visitwarrnambool.com.au



VIC

SPIDER CRAB SWARM, PORT PHILLIP BAY

Each May–June, thousands of giant spider crabs (*Leptomithrax gaimardii*) congregate in Port Phillip Bay. The chaotic blanket of crustaceans is easily viewed with a snorkel from Blairgowrie on the Mornington Peninsula. The gathering occurs when the spider crabs moult – shedding their hard exoskeletons in order to grow larger. The crabs amass in vast numbers to reduce their chances of being eaten during this vulnerable time.

More info: Call the Mornington Peninsula Visitor Information Centre on 03 5950 1579 or visit www.visitmorningtonpeninsula.org

AG Society fundraiser

HUGE FISH WITH BIG PROBLEMS

THE WHALE Shark (*Rhincodon typus*) is the world's largest fish species, reaching up to 20m in length and an average weight of more than 20 tonnes. Sadly, the global population of whale sharks has been falling and last year the species' conservation status was upgraded from Vulnerable to Endangered on the IUCN Red List of Threatened Species. The AG Society is supporting efforts to rescue the species by raising funds for ECOCEAN, Australia's only not-for-profit research organisation dedicated to conserving



the whale shark. For more details about the ECOCEAN project and how schools can be involved in the Whale Shark Race Around the World, see page 21.

DONATE Visit www.australiageographic.com.au/society or post a cheque to: AGS Administrator, Level 9, 54 Park St, Sydney NSW 2000.

QLD

GHOST FUNGUS, SPRINGBROOK NATIONAL PARK



After the first rains in early May, bioluminescent ghost fungi (*Omphalotus nidiformis*) begin fruiting. The species occurs across southern Australia, but a good place to find it is Springbrook National Park, in the Gold Coast hinterland. The fan-like fungi resemble oyster mushrooms – but don't eat these glow-in-the-dark mushrooms! They're highly toxic.

More info: Call Queensland National Parks on 13 74 68 or visit www.explorespringbrook.com

NT

KUTJERA HARVEST, CENTRAL DESERT

Kutjera (*Solanum centrale*) – also called bush tomatoes or desert raisins – are harvested in late autumn/early winter after sundrying on the plants. Cherry tomato-sized, they shrivel and turn golden when ready to eat. But if eaten unripe, kutjera are poisonous. They grow wild across the outback and are cultivated at farms such as Desert Garden Produce, south of Alice Springs.

More info: Call Alice Springs Visitor Information Centre on 1800 645 199 or visit [www.discovercentralaustralia.com](http://discovercentralaustralia.com)



NATURE

Cold comforts

As winter grips the continent's south and Australia's upland regions become blanketed by snow, our alpine plants and animals rely on clever strategies to survive.



WHEN YOU think of Australia, you don't typically picture wintry white scenes. And yet parts of the south-east, and to a lesser extent Tasmania's mountainous regions, receive significant snow during colder months.

The Australian Alps – the Great Dividing Range part that stretches from NSW into Victoria – usually begin receiving heavy snowfalls in June. Temperatures here from June to August regularly fall below 0°C. (Bureau of Meteorology data show Australia's coldest ever recorded temperature was -23°C, at Charlotte Pass in Kosciuszko National Park on 29 June 1994.)

It is in June when the many plants and animals that live here start to adopt key strategies to cope with scarce food, cold temperatures and long nights. Wombats are among the few larger marsupials that remain active above the snowline in winter. Echidnas are also present in the alpine zone, but hibernate during the coldest months.

Many smaller mammals have learnt to live beneath the snow. There's a gap known as the subnivean space between the underside of the snow and the ground, where native creatures such as the bush rat, broad-toothed rat, mountain pygmy possum and Swainson's antechinus move and forage in relatively constant temperatures.

Some species share body warmth at night by nesting together and feast on seeds, grasses and insects, which are easier to catch in cold conditions because they move more slowly. In winter these tiny mammals are also more free to move around than in summer, when they are vulnerable

out in the open to cats and foxes.

Other small animals, such as reptiles like the alpine water skink and frogs, hibernate during winter and some lizard species have been found nestled together in groups of 100 or more in spaces in snow-gum logs. Corroboree and Baw Baw frogs are cold-tolerant and inactive in winter; at summer's end they lay eggs that enter a state of paused development until the snow starts to melt again and floods bogs and streams with fresh water. Fish such as mountain galaxias hibernate in the mud of frozen alpine creeks.

More than half the bird species of the Alps avoid the winter completely by migrating away when it's coldest. For example, olive-backed orioles and satin flycatchers head north to warmer climes, while flame robins, nankeen kestrels and pied currawongs move down to lower altitudes where food is more plentiful.

Plants also have strategies for coping with wintry conditions. In Tasmania's mountains, Australia's only cold-climate deciduous tree, the fagus – or the deciduous beech – flushes with reds and golds in autumn, withdrawing nutrients from its leaves as it drops them completely ahead of winter

(see AG 131). Tasmania's alpine herb fields also have pillow-shaped, low-growing cushion plants that mature very slowly and are particularly adapted to cold and windy conditions.

Other alpine species, such as snow gums, have evolved small waxy leaves as a defence against the cold. These pretty eucalypts are sculpted by highland winds, and, with boughs heavily laden with snow, are the archetypal image of winter in Australia's Snowy Mountains. Australian alpine regions are unique in the world for not having a distinct tree line (the point above which no trees grow) and snow gums can even occasionally be found in protected spots near the summits of peaks in Kosciuszko NP.

So, if you're lucky enough to visit Australia's snowfields this year, don't make the mistake of thinking there isn't much life about: the coldest parts of our continent teem with life specially adapted over millions of years to cope with the harsh conditions. Sadly, this means they are also some of our species most vulnerable to climate change, because they have nowhere to retreat to as their habitats dwindle.

A common wombat
trundles through the snow
in a NSW ski field.

JOHN PICKRELL
is a former AUSTRALIAN
GEOGRAPHIC editor.
Follow him on
Twitter: @john_pickrell.



Survival dance

Seen in their natural habitat, Australia's riflebirds are among the world's most stunning creatures and offer hope for the future of New Guinea's birds-of-paradise.

STORY BY ED SCHOLES PHOTOGRAPHY BY TIM LAMAN

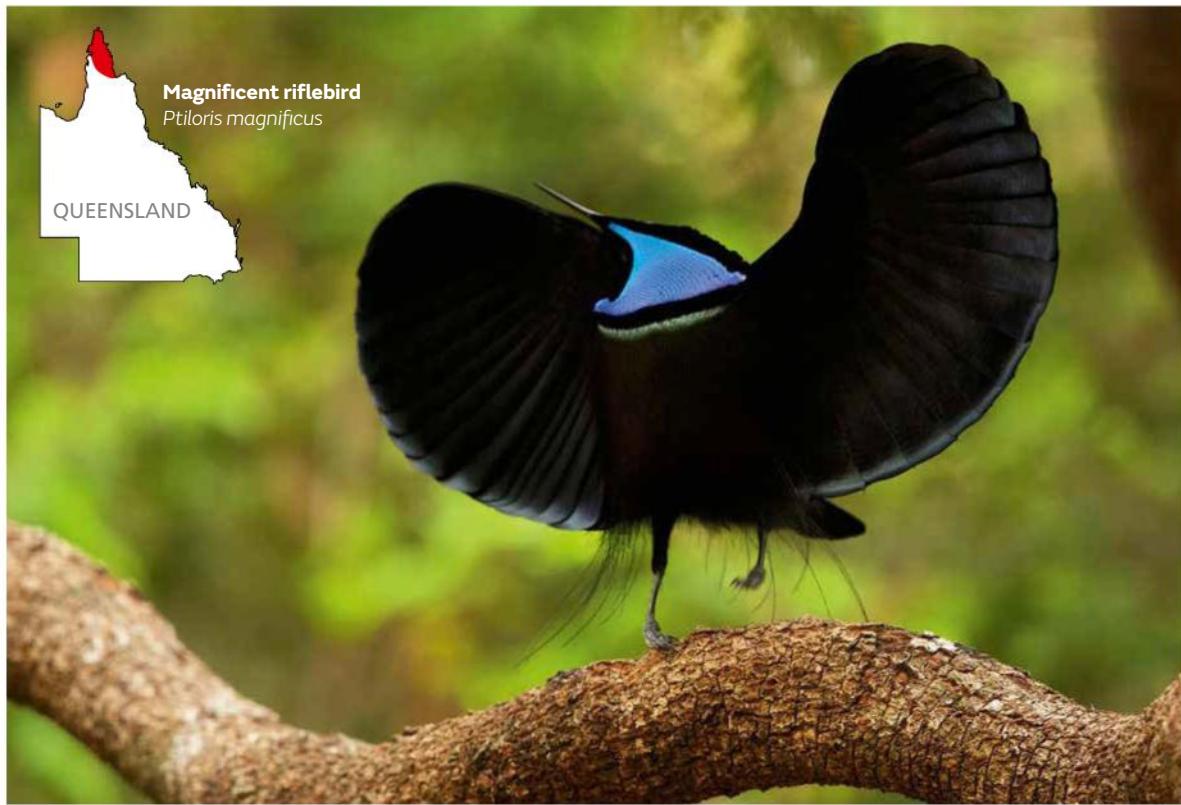




Paradise riflebird
Ptiloris paradiseus



Among birds-of-paradise, looks can be deceiving. Young males like this paradise riflebird at Mount Glorious may look like females in their early years, but reveal their true colours when practising courtship displays.



▲ This male magnificent riflebird at Cape York's Piccaninny Plains wildlife sanctuary transforms from a bird into a fantastic black ovoid form, as it frantically whips its head sideways while moving up and down to the rhythm of its unique display.

IN A PATCH OF rainforest near Mount Glorious, in the D'Aguilar Range, about 30km north-west of Brisbane, I glimpse a male paradise riflebird dart through the trees. Its silky, jet-black body glistens as the blue-green iridescence on its breast shield, crown and tail glints in the late spring sunlight. Birds-of-paradise in the wild are striking, but most exciting about this encounter isn't the bird itself. It's what I see once the bird shoots out of view: the distant outline of the Brisbane skyline. What a contrast.

For more than a decade, wildlife photographer Tim Laman and I have ventured to some of the most rugged and remote New Guinea and Queensland forests in our quest to scientifically document, photograph, and capture footage of each of the 41 species in the Paradisaeidae family as part of our Birds-of-Paradise Project.

These are some of the most difficult birds in the world to see, generally residing in out-of-the-way locations and selecting perches inaccessible to people. Yet the paradise riflebird, one of only four birds-of-paradise found in Australia, lives in the figurative backyard of millions. These treasures dwell in the highland rainforests of the vast Great Dividing Range, just beyond earshot of the bustling cities and towns of northern NSW and south-eastern Queensland.

Renowned for their brilliant colours and ostentatious mating displays, birds-of-paradise are the result of millions of years of evolution and are among the world's most attractive birds. Males often feature large head plumes or fans, vibrant ruffs, flamboyant breast shields and elongated adornments, known as wires or streamers. They use their ornamentation to attract females, performing elaborate dances and poses to garner attention.

While most species are confined to New Guinea and the surrounding islands, four live in Australia – a nod to the massive land bridge that once connected these two great lands. These include the trumpet manucode and three riflebirds: the magnificent, Victoria's, and paradise riflebirds. Two of these riflebirds, the Victoria's and paradise riflebirds, are endemic to Australia.

In most ways, Australia's riflebirds resemble their counterparts in New Guinea: they are largish (ranging ▶

Ed Scholes and Tim Laman

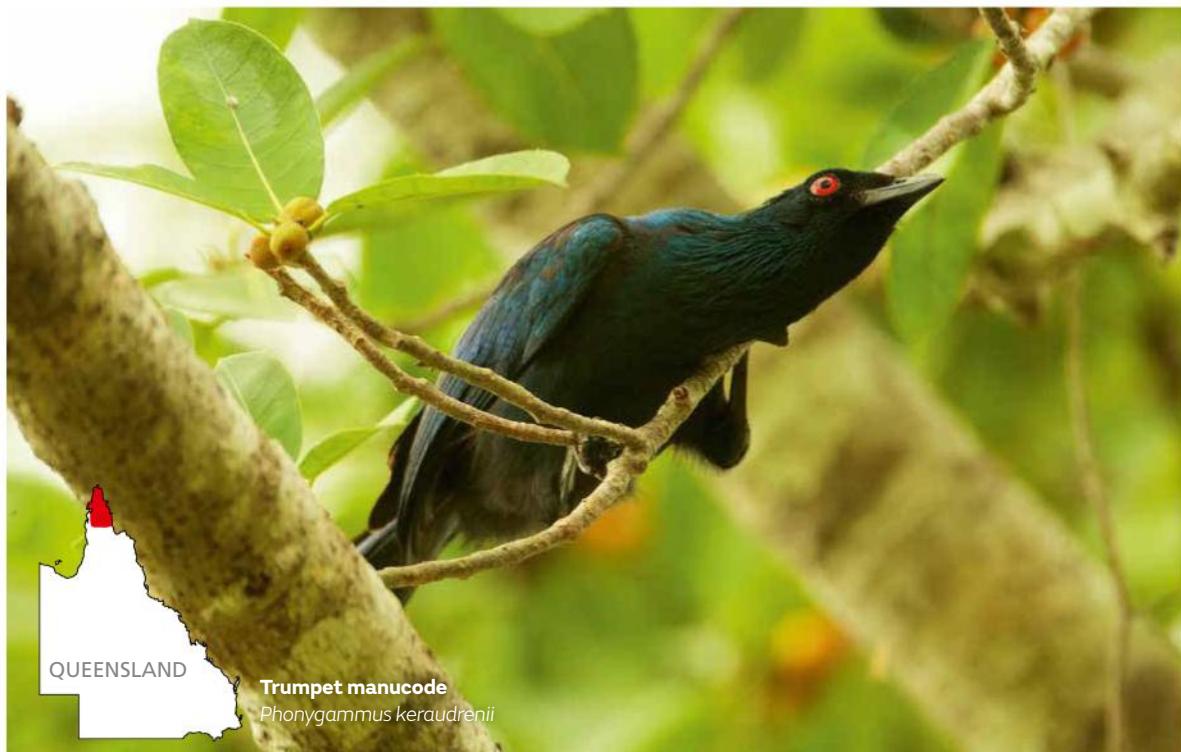
Evolutionary biologist Ed Scholes' fascination with birds-of-paradise lies in how their beauty and variety came to be. He first joined forces with acclaimed wildlife photographer Tim Laman in 2003, after which the pair spent more than a decade together documenting these extraordinary birds.



▲ **Young male** riflebirds try hard to perform like their elders, but can't without specialised adult feathers. This juvenile's pose lacks the distinctive rounded shape made by the unusual wing feathers of an adult male.

▼ **Wildlife photojournalist** Tim Laman peers out from his camouflaged hide near the display perch of a magnificent riflebird, deep inside Piccaninny Plains wildlife sanctuary in Cape York.





▲ **Cape York's trumpet manucode** is a relative of Australia's riflebirds. In all manucode species, the sexes look identical and males don't perform the flash mating displays for which most birds-of-paradise are known.

from about the size of a rainbow lorikeet to that of a magpie); they are predominantly rainforest birds; and only the adult males wear the 'fancy' feathers. The males of all three species are a rich, velvety black and all feature patches of dazzling metallic blue-green iridescence on their breast shields, crowns and tails. This colouration may be what earned them the common name riflebird, because of its resemblance to the uniforms of British riflemen. Females and young birds of both sexes are more demure in appearance, featuring grey-brown striped plumage that looks a bit like pyjamas.

Like all birds-of-paradise, Australia's male riflebirds are beautiful when glimpsed going about their everyday business. But it's when they do what they do best – bedazzle a female into a brief, but intimate, relationship – that they undergo a truly astonishing transformation.

During courtship the true purpose of their remarkable plumage becomes clear. More than merely aesthetic, it is a well-designed prop used to enchant their audience during an intricate mating performance. During courting, a male carefully positions itself to capture the sun's light on its breast. Then it shines the light into the discerning eyes of its female judge. It fans specially shaped wing feathers to create an almost perfect circle; then rubs the feather surfaces together with special wing

During courtship the true purpose of their remarkable plumage becomes clear.

movements to create a rhythmic swish-swish-swish sound. Throughout, its black plumage provides the perfect backdrop for highlighting the stunning flashes of shimmering colour, in the same way a jeweller might use dark velvet or silk to line a display cabinet.

It is these behaviours that Tim and I have worked so hard to document through the Birds-of-Paradise Project, and the results are remarkable. After 18 expeditions to 51 different field camps over the course of eight years, Tim has managed to capture images of all 39 bird-of-paradise species. Most of these were difficult to find and even more difficult to photograph, which is what made our experiences in south-eastern Queensland so special. Observing Australia's riflebirds in their natural habitats offers hope for the future of birds-of-paradise in New Guinea, where humans are increasingly encroaching on once remote habitats.

Of Australia's three riflebirds, the magnificent riflebird is the largest and only non-endemic species. Unlike the other two, it is decidedly not a 'backyard' bird. In New ▶

EXCLUSIVE Australian Geographic AG READER EVENT

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Editor-in-chief
AUSTRALIAN GEOGRAPHIC

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Meet acclaimed AG wildlife
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underwater photography master

DARREN JEW



Don't miss this joint Coral Expeditions and Australian Geographic Society reader event featuring Canon ambassador Darren Jew, one of the stars of National Geographic's hugely successful *Tales By Light* TV series. Hear about his amazing life, including how he photographed a dozen male humpback whales chasing a single female during a Tongan

'heat run', and what it was like to swim with groups of playful sea lions off Australia's southern coast on assignment for AG.



- Thursday 18 May 2017, doors open 6pm. Event begins 7pm.



- Reef Theatre, SEA LIFE Sydney Aquarium
- Seated tickets: \$35, or \$30 for AG subscribers/members.
- Standing room: \$20

Book now via our website. Places are limited so don't delay.
www.australiageographic.com.au/society/events

Enquiries to society@ausgeo.com or phone 02 9263 9825

Because seating is limited we have made standing places available for this event. The main talk will last for about an hour, and there will be other short presentations from our partners, plus a Q&A session.

Ticket price includes complimentary access to SEA LIFE Aquarium from 6pm, for one hour before the formalities begin at 7pm. Ticket price also includes complimentary wine and canapés after the presentation.



▲ A male Victoria's riflebird in full display is a splendour to behold. Because this species is found in many parks and reserves in north-eastern Queensland's Wet Tropics, it is likely to be the most readily viewed bird-of-paradise.

Guinea, it is widely distributed in hill forests, but in Australia the species is confined to the northern reaches of Cape York Peninsula, in far north Queensland. In seasonally wet parts of the Cape, the magnificent riflebird is restricted to narrow corridors of gallery rainforest near rivers, where it is hard to spot and can be quite rare. In other parts of the cape, such as Kutini-Payamu (Iron Range) National Park, it is more abundant and easier to encounter. Here, twitchers can find it by listening for the powerful whistles of the male, which signal its presence.

Victoria's riflebird is the best known of the Australian trio. Its homeland is among the parks and reserves of the Wet Tropics, between Townsville and Cooktown, in north-eastern Queensland. Because this area is popular with tourists, there are places where Victoria's riflebirds have become used to visitors and it's not uncommon to see them looking for an easy meal near cafes, ecolodges and other tourist hotspots. On one of our field trips, Tim and I saw this species display in a rainforest patch that was literally in the backyard of a colleague and friend.

Despite being less well known than the Victoria's, the paradise riflebird of northern NSW and south-eastern Queensland is actually the easiest to spot. After several days of photographing a handful of these cooperative birds in the D'Aguilar Range – including a couple of

In New Guinea, birds-of-paradise face forest loss as cities and towns expand.

young males in their 'stripy brown pyjamas' taking turns practising their awkward displays to one another – Tim and I found ourselves filled with envy. We began joking about how we might convince our families to move to Australia from the USA so we too could have birds-of-paradise in our backyards.

But fantasies aside, our time with the Australian birds-of-paradise gave us hope for the future of this incredible family of birds in their natural stronghold, the wilds of New Guinea. There, they face the imminent threat of forest loss as the country's cities and towns expand. Australia's riflebirds show us that it is possible for humans and birds-of-paradise to cohabit.

It gives me hope that in New Guinea these remarkable birds will survive into the future if intact forests are preserved, cut forests are allowed to regenerate and development is sustainable.

SEE Tim's images of New Guinea's birds-of-paradise online at: www.australiageographic.com.au/issue138



exploretnq.com.au

Kayaking along the beautiful tropical coastline at Mission Beach, TNQ





Caught in the headlights

An encounter with a kangaroo left dying on a roadside spurred Doug Gimesy into action. Now this winner of the 2016 AG Nature Photographer of the Year 'Our Impact' category is using his images to raise awareness of the issue.

STORY AND PHOTOGRAPHY BY DOUG GIMESY



Just a few hundred metres from Kangaroo Island's largest national park, speed limits increase to 110km/h and the killing field begins – nearly 100km of road that passes through dense kangaroo habitat.



THE NIGHT was crisp. The stars were sparkling. It was July and my partner, Heather, and I were enjoying a week on wild and beautiful Kangaroo Island. That was until we saw the roo, lying on the roadside. Its head turned as we rolled past, but it didn't get up. "That's strange," Heather said. "Turn around, I want to see if he's alright." I stopped and grabbed a torch. I'll never forget what I saw.

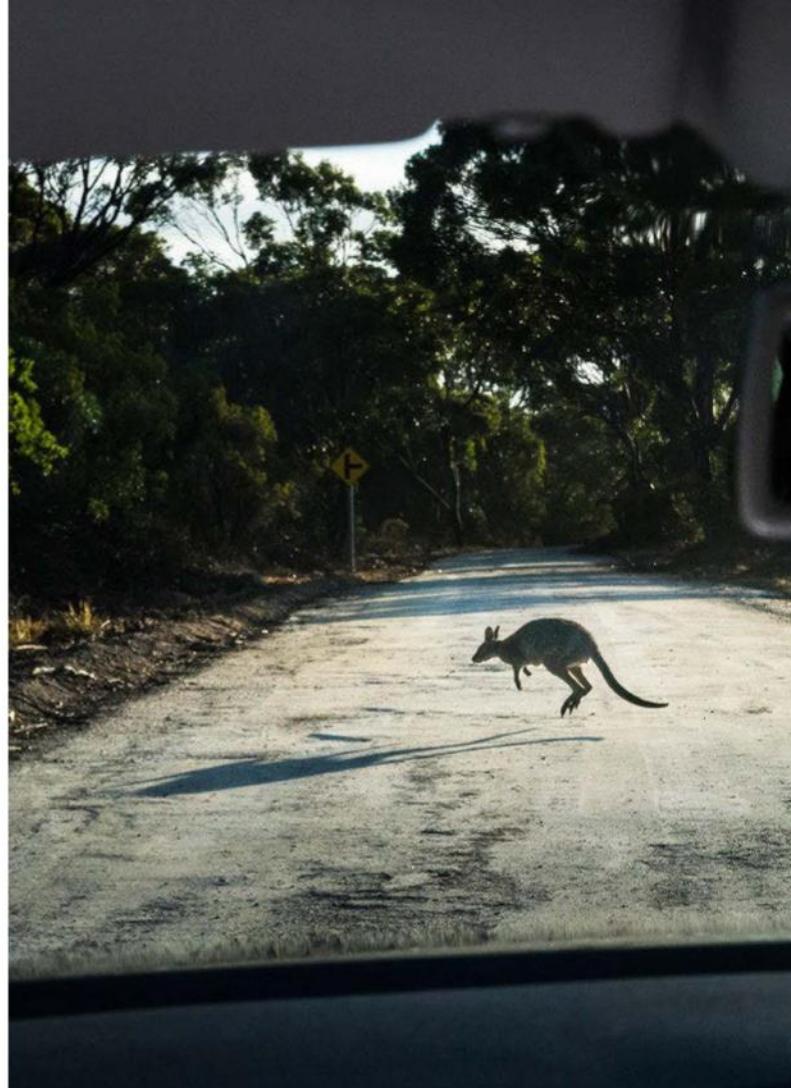
As we approached, it started to stir but didn't stand – just feebly pulled itself along a few feet using its front legs. I swept the beam of my torch from its head to the lower part of its body, and my heart sank. One of its powerful rear legs was snapped and pointing in the wrong direction, bone exposed. A gruesome trail marked where it had dragged itself as it tried to move off the road.

Its bloody eyes blinked with terror and its breath quickened. Frantically, it tried to crawl towards the safety of the bush. It was then I realised the term 'roadkill' doesn't describe the suffering that can occur before you finally drive past the rigid carcasses that litter our roads. Often, roadkill isn't as instant as we think.

KANGAROO ISLAND (KI), 13km off South Australia, is the country's third-largest island. Once the domain of primary industries, KI is now a flourishing tourism hotspot, with more than 190,000 people visiting annually. Touted as a premier wildlife destination, one-third is dedicated to conservation areas and national parks. It is rich in wildlife, including the KI subspecies of the western grey kangaroo. With no natural predators, it is the slowest moving of all kangaroos.

Sadly, each year hundreds are either killed, fatally injured or maimed by cars – along with thousands of other animals, including goannas and echidnas. "It's distressing to think that about 50 per cent of kangaroos and wallabies injured by cars may appear OK and hop off into the bush, but the reality is they are just trying to get far away from the situation and end up dying a slow, painful death," says Kate Welz, president of the KI Wildlife Network (KIWN).

Exact figures on how many kangaroos are killed or injured are hard to find, because official traffic accident data parameters are very narrow. In SA, for example,



From dusk to dawn is when many Australian animals are on the move and their low light-sensitive eyes can become temporarily disabled by the blinding glare of bright headlights. It's also when driver visibility is reduced.

figures include only accidents reported to the police that involve property damage of more than \$5000.

What we do know is that most wildlife vehicle incidents reported in SA involve kangaroos or wallabies, with data suggesting they account for 94 per cent. Karen Masson, CEO of Wildlife Victoria, says last year her organisation received 4600 calls specifically related to these, but many collisions are not reported. It is likely that more than 10,000 kangaroos and wallabies are struck each year in Victoria alone.

DAWN AND dusk are high danger times, when the chance of hitting wildlife spikes. And yet KI still doesn't have speed-limit reductions in place.

Some residents have long campaigned for local councils and the SA state government to reduce speeds at these times. SeaLink, the ferry operator that links KI with the mainland, supports driver education. The island's Budget car and truck rental office gives customers KIWN driver-education brochures. And Mayor Peter Clements also backs actions to reduce wildlife trauma.

Sandy Carey, a dedicated wildlife conservationist who's lived on the island for four decades, has been ▶





A major threat to the Kangaroo Island echidna (above) is motor vehicle collisions. Yet another koala joey (below) orphaned by traffic is rehabilitated by KIWN's Kate Welz.



Kangaroos often come in from the bush looking for a free breakfast from veteran KI wildlife carer Sandy Carey.

What to do if you hit an animal or find injured wildlife

Stop: If it is safe to do so, pull over and check whether the animal is still alive. If you spot pink paint on it, it's been checked by a wildlife carer and there is no need to stop.

Call for help: Contact the local wildlife rescue group.

Check the pouch: Older joeys may survive for days in a mother's pouch and can sometimes be saved.

Move dead animals away from the road: Dead animals attract scavengers and increase the chance of further collisions. Even a few metres will help.



Rescued traffic-orphaned roo joeys relax safe and warm in temporary pouches until they are old enough and well enough to live outdoors.

A lucky few are rescued and cared for until they are well enough to be relocated.

hand-rearing orphaned joeys for 20 years. She's also spent much time lobbying for speed restrictions. "I just don't understand why it's so hard to implement speed limits or at least advisory signs at times and in places where everybody knows there's a higher chance of an accident," Sandy says. "We do it around schools, so why not in other places? It would only add a few minutes of travel time here and there. Tasmania has managed to do it so why can't we?"

Some locals note just 50km of road desperately needs dusk-to-dawn speed limit reductions. Yet vehement opposition persists. Local member Michael Pengilly, for example, recently rejected the idea, saying the KI community does "not need to be told how to drive and what speed to drive at on the roads at night-time".

IFA KANGAROO HAS been injured to such an extent that it requires euthanising, professional help can sometimes be far away. Sensible gun regulations and laws in Australia mean an animal may need to be killed using any rudimentary implements at hand, such as a tyre iron or a rock.

On a good day, when people stop to check an injured or dead kangaroo, a joey can often be found alive in its mother's pouch. If not rescued quickly, however, it will die from hypothermia, dehydration, starvation or stress. Young ones can survive a maximum of 48 hours, and older ones up to three days.

A lucky few are rescued and cared for until they are well enough to be relocated. Many of these dedicated

carers are members of KIWN. They make rearing these babies a part of their daily routine, feeding them up to six times a day for months.

"You've got to give them the attention and love that any mum would give them," carer Pauline Lanthois says. "Feed them, toilet them, wash them, clean their bed and take them to the doctor when they're sick."

STANDING NEXT TO the dying kangaroo, I didn't know what to do. I couldn't kill it so I called carer Sandy Carey, who in turn phoned the kangaroo's location through to the local ranger. Reluctantly, Heather and I went on our way, hoping the ranger would arrive swiftly and end the animal's suffering. The next day when I went back to check, the kangaroo was gone. I'll never know if it spent hours in agony or whether the ranger got there in time.

Later, when I returned home to Melbourne and edited my images, the shot of this injured kangaroo reduced me to tears. As a photographer, I use pictures to highlight the impact humans have on the natural world. In the case of the KI kangaroos, I hope they make people think about slowing down and, in the process, prevent much unnecessary road trauma.

I have since dedicated my photographic skills to highlighting the problem of the safety of our wildlife, like the roo we couldn't save.

AG

SEE uplifting images of animals rescued from road trauma at: www.australiageographic.com.au/issue138

Travel safe

Beware at dawn and dusk:

Many animals are on the move at these times, so either avoid travelling then or slow down.

Use your lights: Turn headlights to high beam if driving more than 80km/hr or low beam if below 60km/hr.

Don't litter: Rubbish can attract scavenging animals to roadsides.

Go slow: If you see wildlife on the road, slow down and pull your vehicle over, if it is safe to do so, in order to allow an animal time to cross.

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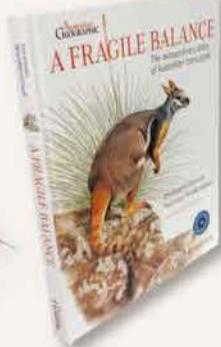
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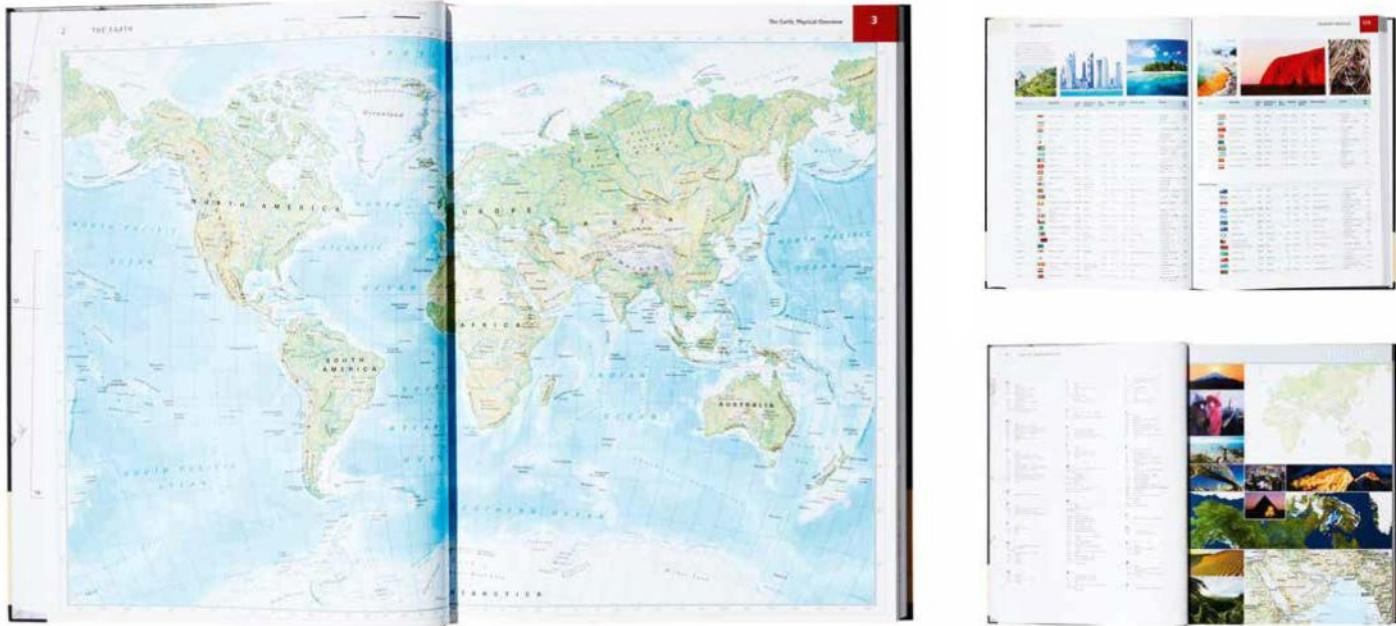


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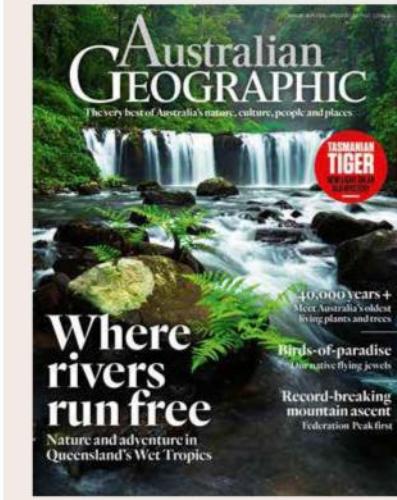
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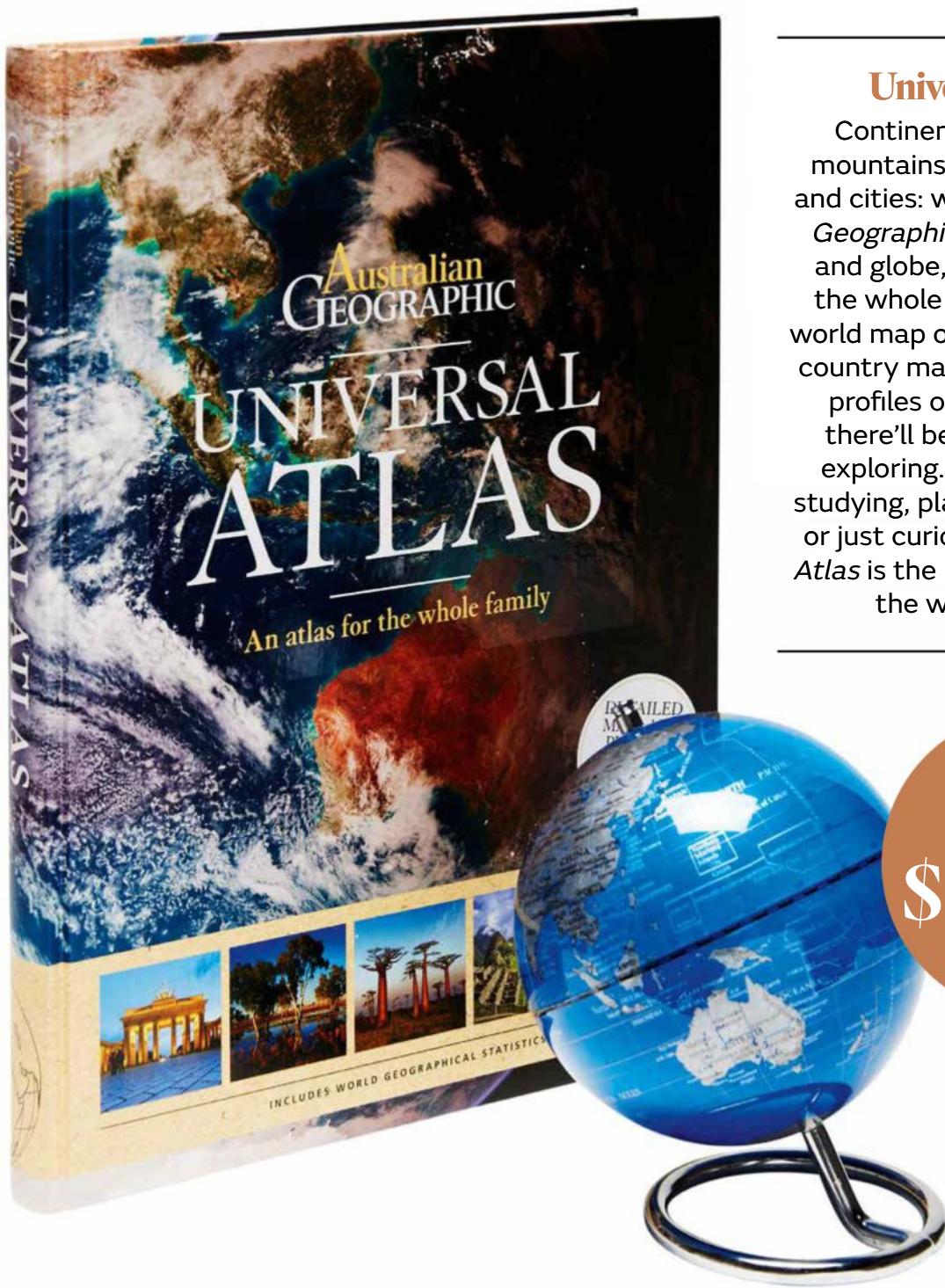
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TROPICAL NORTH QUEENSLAND ADVENTURES

Into the Wet

Ancient geological links connect the steamy rainforest to the colourful reef in Australia's tropical north. The best way to explore both is to get wet, go offroad and share a lodge with Lumholtz's tree kangaroos.

STORY BY JEREMY BOURKE PHOTOGRAPHY BY DON FUCHS



This creek just below the Cardwell Spa Pool is typical of waterways in the Wet Tropics: cold, clear, crisp and hemmed in so tightly by the forest that the summer sun barely gets a look-in.



Douglas Creek, on the Atherton Tableland, explodes through a narrow chute to create the spectacle that is Nandroya Falls. They plunge 50m into a broad pool from which the creek then escapes over a broader but shallow cascade to the side.



MARTY IS DEADLY serious as he looks at us. “You *will* get wet,” he says. The whitewater rafting guide then breaks into a smile. “You *will* have fun...and you *will* get wet.”

It’s only 9am and already the mercury is pushing 35°C. We’re in Tully Gorge National Park, about 95km south-west of Cairns in far north Queensland. Our only cool relief will be from the river.

It’s February, the Wet is in full swing and the river is running high and fast. Our raft – one of seven – will be commanded by Dave Macfarlane. The Raging Thunder Adventures guide knows just how powerful the water is, because the Kareeya Hydro Power Station above us is at maximum output, hitting an impressive 88 megawatts. He adjusts our route accordingly.

It’s not just the churning Tully River that has benefited from the deluge. Across the region, the waterfalls are roaring, the look-outs are lush and, as a cooling afternoon storm rolls in, the sky turns from clear blue to a brooding charcoal.

In the rainforest everything seems alive. Day and night, every bird, bug and frog sings happily among the dripping leaves. The Wet Tropics are nothing if not loud.

But today, the attention of our helmeted and life-jacketed group of 40 is focused on the boulder-filled Tully River that cuts through the 54,300ha national park.

Among those on board our raft is Shaun Bennett, who spends eight months of the year spreading concrete in Medicine Hat, in the Canadian province of Alberta, and the other four feeding an adrenaline habit. He’s only been in the area two days and has already chalked up one tandem skydive and six bungee jumps.

Tomorrow he’s diving on the Great Barrier Reef, but I wonder if the Canadian realises just how closely north Queensland’s two great World Heritage areas – the ancient rainforest and colourful reef – are linked. Dr Paul Chantrill, a Wet Tropics Management Authority program manager, says he probably does; the interdependence between the two always piques the interest of visitors. The Reef was rainforest 10,000–20,000 years ago and below the surface is still inextricably connected to it. Fresh water disgorges 20–30km out to sea through ‘wonky holes’. These were once river channels that, when the last Ice Age ended and the sea level rose, were covered in sediment to form underground pipes.



▲ This straight but technically difficult Grade 4 rapid on the Tully River is aptly known as the Corkscrew, but all seven rafts in our group make it through the section without losing anyone overboard.

Today, our trip is only 12km, but it’s a wild ride and follows a strict hierarchy. The river, which changes character daily, tells the guide what to do, and he then directs us: paddle forwards, paddle backwards, paddle hard, stop, hold on and – in the big rapids – get down. Sometimes all these instructions are fired in rapid succession. But you’re never doing one for more than five or so seconds, and the rest is gentle drifting – both in and out of the raft, which we sometimes exit involuntarily.

BEHANA GORGE, about 60km to the north-east, looks similar to the one we just paddled through: steep cliffs, raging water and a steamy atmosphere. But here a raft is useless – what we’ll be descending is like a giant staircase of water.

The gorge is a popular swimming spot for locals and Sam Day has been coming here with his mates since they were teenagers. Now he guides professionally through his Behana Canyoning business and for the next few hours we treat it as our playground. In wetsuit tops, life vests and helmets, we leap from ledges into the river, swim against its current, use rocks as waterslides, scoot through chutes and finally abseil down to get to Continued page 62 ▶

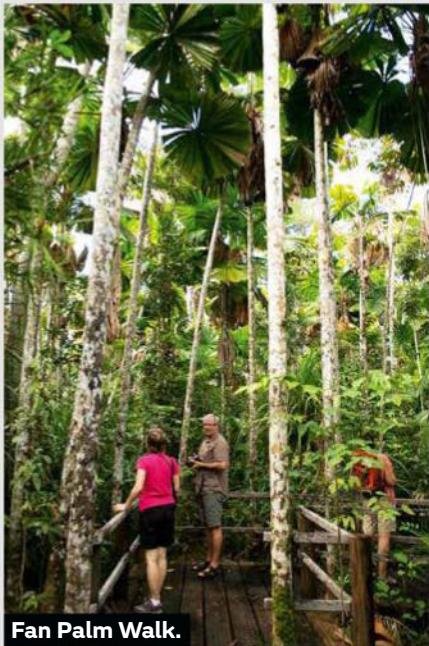


▼ Our novice attempts at paddling seem to have little effect against the force of the white water, but our boat's guide Dave Macfarlane assures us that every little bit helps – as long as we follow his instructions to the letter (below). Even with all this water around, it's a hot day on the Tully River (bottom). Waiting for our boat to get its turn for a refreshing shower under Ponytail Falls are Chris (at left) and Phil, uni mates from Queensland, and Canadian adventure-seeker Shaun Bennett (obscured).



THE WET TROPICS

Reached via the scenic Cardwell Forest Drive, the Cardwell Spa Pool (right) is a sensational place to escape the heat. The Fan Palm Walk (below) is another cool, although slightly less wet, diversion in Djiru National Park, inland from Mission Beach, where a 1.3km boardwalk passes under tall fan palms.



Fan Palm Walk.

When to go

November to April is the Wet, when the waterfalls and rivers run high and full. The days at this time are hot and steamy: humidity often climbs above 60 per cent and average daily temperatures can regularly reach above 30°C, although they are usually tempered by a cooling storm in the evening. The 'dry' winter months are more temperate but also much busier.

Getting there

From **Cairns**, it's a 90-minute drive to Atherton and the southern tablelands via either **Gordonvale** or **Mareeba**. To the south, **Tully** is two hours drive and **Cardwell** two and a half hours drive.

A tightly folded young king fern frond. Mature fronds can grow up to 9m long in the Queensland tropics.



Cardwell Forest Drive.



Wooroonooran NP.



Immense buttress roots (far left) are a feature of several rainforest tree species in the Wet Tropics. This one is on the path to Nandroya Falls. Umbrella tree (*Schefflera actinophylla*) fruit (left) is eaten and spread by many rainforest bird species.

Where to stay

This large region has all manner of accommodation. In cosmopolitan Cairns, the Double Tree by Hilton is centrally located on the waterfront and close to all amenities.

Five and a half hours drive south-west of Cairns on the Tableland, the Big4 Atherton Woodlands Tourist Park at Atherton has single and multi-roomed cottages and villas, plus

caravan sites and camping, all in a tropical rainforest setting.

On the Cassowary Coast, the Cardwell Beachcomber Motel and Tourist Park offers motel rooms, villas and camping areas, all on the waterfront.

Points of interest

- 1 Behana Gorge
- 2 Yungaburra
- 3 Babinda Boulders
- 4 Mount Hypipamee NP
- 5 Nandroya Falls
- 6 Mamu Tropical Skywalk
- 7 Tully Gorge
- 8 Fan Palm Walk
- 9 Cardwell Forest Drive
- 10 Blencoe Falls

More information

Queensland parks

www.npsr.qld.gov.au/parks/

Tourism Tropical North Queensland

www.tropicalnorthqueensland.org.au

Wet Tropics Management Authority

www.wettropics.gov.au/exploring



The cassowary is an important rainforest gardener, spreading the seeds of rainforest trees. Sometimes the seeds are so large, no other animal is able to swallow and disperse them.



Water has both sharpened and smoothed the granite boulders like an outdoor sculpture park.

an outcrop that Sam's offsider Dom Godwin calls Paradise Pool. "Some people say they like to live life on the edge," Dom says. "We like to live over the edge."

Not every Wet Tropics water experience is extreme. About 50km south of Cairns on Babinda Creek is a beautiful wide pool above the Babinda Boulders, which can be seen only on the Devil's Pool Walk, a 1.3km return track taking in three viewing platforms. Each shows how water has both sharpened and smoothed the granite boulders like an outdoor sculpture park.

Other tranquil swimming hideaways in the region include Josephine Falls, Alligators Nest at Tully and the Spa Pool, near Cardwell, where the creek runs through a depression in its rocky bed, creating a natural jacuzzi.

THIS AREA IS called the Cassowary Coast, but so far the 1.8m-tall birds have avoided us. We've been told our best chance to see one is on the easy 1.3km Fan Palm Walk in Djiru National Park, 5km south of Mission Beach. Insects and tropical birds create a racket around us, but the rustling in the dense forest is not caused by foraging cassowaries. Rather, it's the wind flapping the fronds of the fan palms, which thrive in almost permanently soggy soil due to their broad shape allowing for maximum sunlight absorption.

We spot none of the elusive birds on our walk, but next morning a pair saunters past our motel in Tully. And later, on a scenic drive back up the Tully Gorge, one stands feeding by the side of the road, barely noticing as we get within 10m to admire its glossy blue-black plumage and striking blue neck.

Since we've been in Tully, there's been no sign of rain, although it's never far away. Tully holds Australia's record for the highest annual rainfall in a populated area. In 1950 there was a total yearly downpour of 7.93m, which looks a mighty lot when measured out centimetre for centimetre by the Golden Gumboot monument in town that memorialises the event.

Records aside, understanding the rain is critical to the region's primary producers. Every day at 9am John Edwards, production manager at Tully Sugar, records the gauge reading in the mill's yard. "It's a tool we rely on," John explains. "Cane is a grass that needs sunshine and water to grow. But all field work is mechanised and if you can't get out there because it's too wet, we have to stop crushing."

He laments that in Tully "it always seems to rain, but 5km down the coast it doesn't". That's because the town sits sandwiched between the coastal Walter Hill Range and inland Mt Mackay, which creates a moisture trap.

While the locals have learnt to work around the rain, the Wet has become an export attraction. Mamu Tropical Skywalk customer service officer Sherrill Mehonoshen says the most positive comments are from the British: "They love the tropics because it's wet, but not cold."



▲ **A popular spot** in the shadow of Queensland's highest peak, Mt Bartle Frere, Josephine Falls is like a water park for locals even though it can sometimes be hazardous to enter. This is the lowest of four separate drops in the Josephine Falls precinct.

The vista that Mamu unveils from its 350m-long walkway jutting into the North Johnstone River Valley is truly spectacular. Via the skywalk, or the alternative forest path, you arrive at a 100-step tower. After a breathless climb, you can gaze north up the valley to layer upon layer of ridges and peaks that fade off into the heat haze.

This treetop attraction, which is located about 30 minutes drive inland from Innisfail, was born out of a recent infamous disaster. In March 2006 Cyclone Larry shredded so much of the rainforest around here that the skywalk was able to be built with only minimal manual clearing.

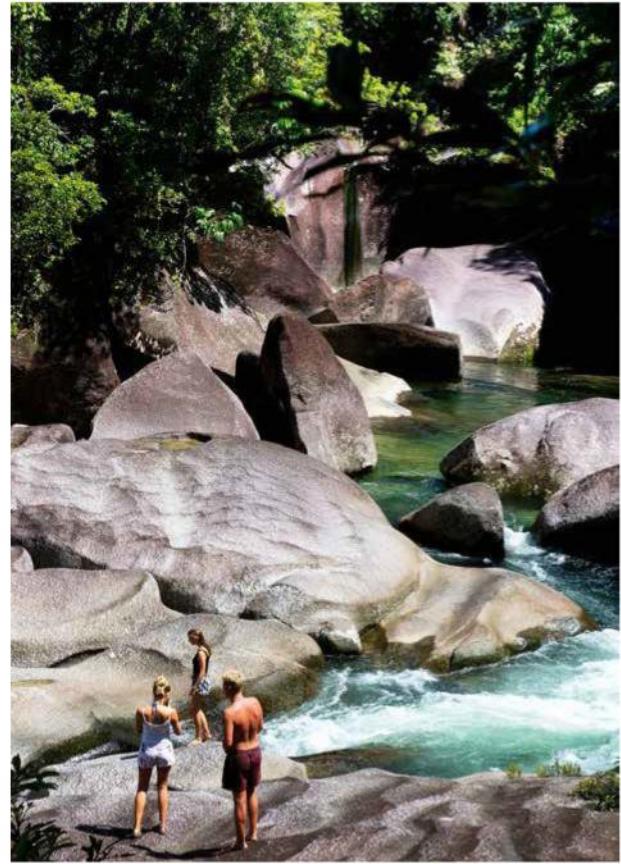
Advantage was taken of a natural cycle: much like a eucalypt forest needs fire, destructive winds break up the rainforest canopy, allowing sunlight in to ignite the next generation of growth.

The waterfalls here are also thriving in the Wet – the 18m Millaa Millaa Falls is easily the prettiest we see. But near Mamu is a 3.5km track to the less frequently visited Nandroya Falls, which are narrower, higher and more impressive as Douglas Creek drops 50m from a narrow chute.

Continued page 66 ▶



▼ **The distinctively shaped granite Babinda Boulders** sit in a beautiful stretch of Babinda Creek, an area known as Devil's Pool, or sometimes Oolana's Pool. Oolana was a young Wanyurr woman who, Aboriginal legend says, threw herself into the water after being spurned by her lover.



Negotiating a tricky rock-hopping exercise in Behana Gorge, where the canyoning experience is totally immersive.





Clockwise from top left: An Australian giant 'rainforest' centipede (*Ethmostigmus rubripes*) crawls out from under a rock beside the road; the glorious green of the Giringun NP section of the Kirrama Range Rd; the spectacular drop of Blencoe Falls, where the Herbert River plunges 90m; council workers Shane Flanagan (at left) and Chris Sheely deal with the first of the 'roadblocks'; at Tuckers Lookout, the expansive view is across the Kennedy Valley to the Cardwell Range, Hinchinbrook Channel and Hinchinbrook Island, which at 40,000ha is one of Australia's largest island national parks.



Kirrama Range Road

This historic road that winds through World Heritage-listed rainforest is considered one of Queensland's great early engineering feats.



WE'VE BEEN told that if you want to experience it *all* in the Wet Tropics – a stunning vista, rugged waterfall, rainforest walk and wildlife, with a bit of adventure thrown in – then take Kirrama Range Road to Blencoe Falls.

Starting 11km north-west of Cardwell, via Kennedy, it was built in the 1930s to serve a tiny timber-cutting community and was reopened in 2014 after Cyclone Yasi.

The guide says it's just 62km to Blencoe Falls – but three hours driving time. As it turns out, even that's ambitious.

A kilometre or so up the road, a fallen tree blocks the way. It's too big to move, and we must back-track most of the way to Kennedy to get phone coverage to report it.

Cassowary Coast Regional Council send a crew, and we're soon joined by Shane Flanagan and Chris Sheely, who, with the squeal of a chainsaw, have the log gone in a matter of minutes. Chris continues ahead to clear more blockages – six in total.

This road still has patches of old bitumen – left there because “it's historic”, says Shane – but even without snags we take it carefully.

The promised vista finally appears at Tuckers Lookout, where we gaze down the Kennedy Valley out to Hinchinbrook Island, 4km off the coast. At Society Flat, an easy 720m circuit introduces us to the giants lurking in the rainforest. These include towering kauri pines, which can grow up to 45m high.

As we descend, the rainforest soon yields to savannah grassland and we take the turn towards Blencoe Falls Camping Area. From here we can walk to Blencoe Falls. We're level with the top of this cascade, which plunges 90m to a cauldron of foam. Yet just a few hundred metres down the gorge, the tranquil Herbert River looks as if it's barely trickling.

A building storm threatens to block our path again, so we turn for home. But the only obstacles we see are animals – cattle, eastern grey kangaroos, a wild pig, a pair of turtles crossing a low causeway and a wallaby bent low as it darts in front of us.

THE FINAL BLAZE of the setting sun is a cue for frogs and other wildlife to begin stirring to feed. Alan Gillanders, a former teacher who's run wildlife tours on the Atherton Tableland for 14 years, has developed a sense for where such creatures might be lurking, which is handy because it's pitch black along the track to Dinner Falls in Mount Hypipamee National Park, south of Atherton. Suddenly, he stops and swings his light up to a branch where a prehensile-tailed rat sits.

At ground level he susses out two northern barred frogs, then again his beam hits the branches above – almost instinctively – and we spot the white stomach of another frog perched above. We turn off all our lights to admire luminescent fungi and fireflies. Then Alan scans the forest with a thermal imaging device and detects something. "It's big," he says, and his spotlight picks up a red-legged pademelon in a gully.

The next day, Alan takes us to a place favoured by creatures that are a little shyer. Along Peterson Creek in Yungaburra there's a spot where platypus venture at dawn or dusk. But because it's mid-morning our attention is turned skyward, where two green ringtail possums embrace, probably a mother and her young.

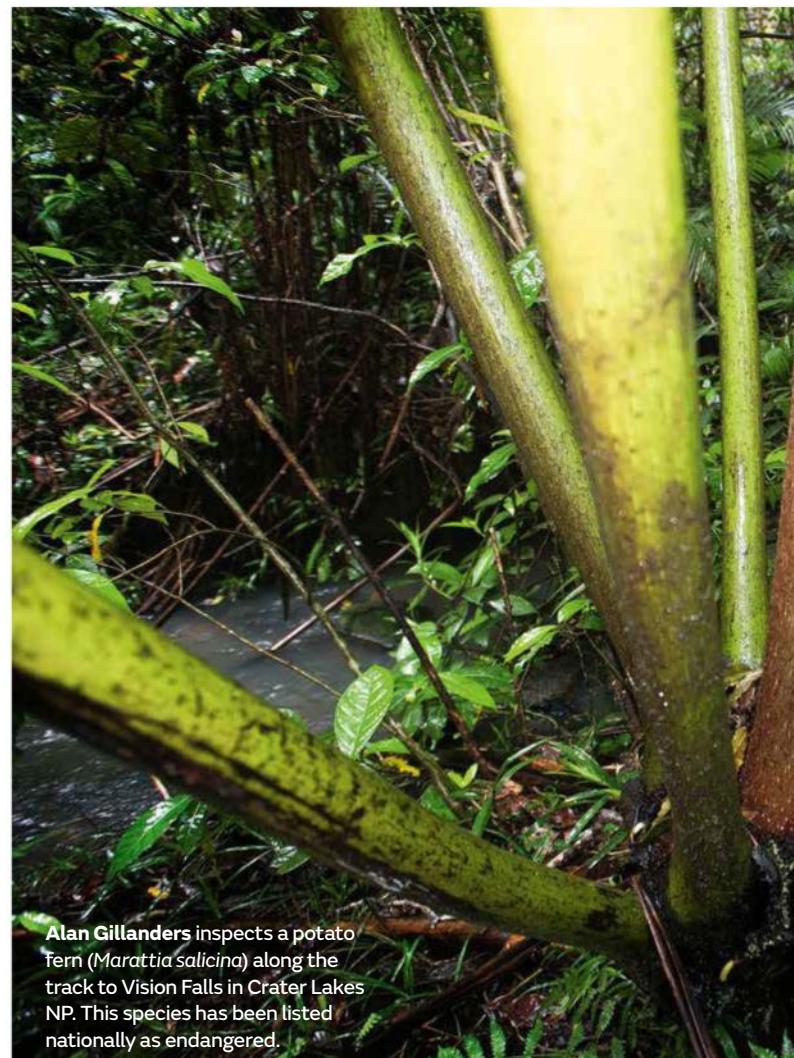
"Their diet is quite nasty," Alan says. "Just about everything they eat is poisonous, so they look for the least toxic of the species. They have favourite trees and even favourite branches."

This part of the Tableland is volcanic and Lake Eacham is a perfect example of a maar crater lake – shallow and broad. But Alan has a hidden treasure for us to discover in the surrounding Crater Lakes National Park. Near the bridge on Wrights Creek Road, an un-signposted track takes us down through the rain to Vision Falls. This forest is dark, but Alan's seen it darker. "It used to be like a tunnel in here, but the forest took a caning during Larry," he says. "I walked in afterwards and teared up. You could now get sunburnt in the forest. But it's still a special place."

The tree kangaroos in this area are a reminder of how vulnerable Australia's tropical north is.

WE'RE GREETED in Margit Cianelli's kitchen by Gerald, a small rufous bettong, while Lily the pademelon suns herself in the lounge. Meanwhile, out of Margit's shirt appears Dobby, an eight-month old tree kangaroo who, without the protection of her mother's pouch, needs constant cradling. This is Lumholtz Lodge, a B&B-cum-wildlife rescue centre, one and a half hours drive south-west of Cairns.

The Lumholtz's tree kangaroo is Margit's specialty and this German-born wildlife carer has lost count of the orphans she's nurtured during several decades at her private 65ha rainforest sanctuary at Upper Barron. Tree kangaroos Kimberley, her son Monty and orphan Dobby sleep in Margit's room at night. She



Alan Gillanders inspects a potato fern (*Marattia salicina*) along the track to Vision Falls in Crater Lakes NP. This species has been listed nationally as endangered.

wakes at about 2am to feed Dobby, and usually Kimberley is ready to be let outside then. But Margit looks anything but exhausted. During our excellent German-style breakfast, she cradles both Dobby and Monty in her shirt, and then it's time for Monty to be reunited with Kimberley in the rainforest.

Kimberley wears a radio-tracking collar and within minutes she's located high in a fig tree. Margit puts Monty onto a branch and Kimberley comes down to greet her son. They sit together for a few minutes before moving higher in the tree kangaroo's distinctive style – pulling up with both front paws then pushing with the legs.

They leap to another branch with astounding agility, then come down to the ground, off exploring until late afternoon, when Margit will call them in for the evening.

Although the Wet has the tropics flourishing, the tree kangaroos in this area are a reminder of how vulnerable Australia's tropical north is. Primary industry is swallowing up more of the natural habitat of these marsupials and they are at risk. But people like Margit – and the other locals who have become guides and help orchestrate a love affair between people and place – are fighting to protect their home territory.

AUSTRALIAN GEOGRAPHIC thanks Tourism Tropical North Queensland, Double Tree by Hilton Hotel Cairns and Avis for assistance with this story.

AG

SEE more of Don Fuchs's spectacular Wet Tropics images online at: www.australiageographic.com.au/issue138



▼ This northern barred frog, detected on one of Alan Gillanders' night-time wildlife tours at Mount Hypipamee NP, is camouflaged perfectly to blend in with the decaying leaf litter where it lives on the rainforest floor.



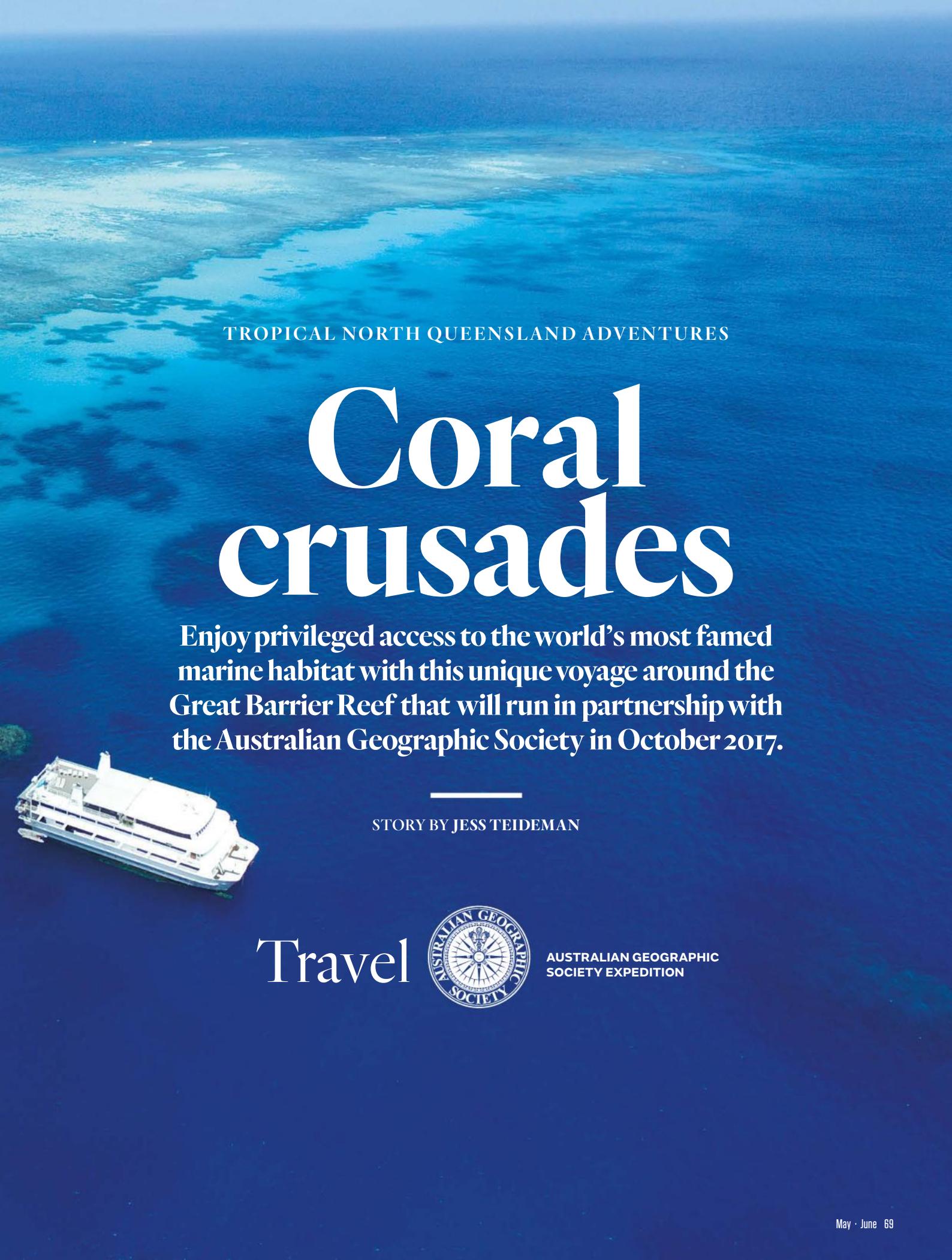
▲ Wildlife carer Margit Cianelli with Nelson, one of four tree kangaroos currently in her care at her personal sanctuary on the Atherton Tableland.



◀ Mother and son
Kimberley (at left) and
Monty in the forest at
Lumholtz Lodge, which
Margit runs with her sister
Karin Semmler. Both women
are trained zookeepers.



Coral Expeditions II attaches to an exclusive permanent mooring on remote Nathan Reef. From here divers descend directly onto coral-lined drop-off walls, while snorkellers, with merely a few flipper kicks, hover over coral gardens.



TROPICAL NORTH QUEENSLAND ADVENTURES

Coral crusades

Enjoy privileged access to the world's most famed marine habitat with this unique voyage around the Great Barrier Reef that will run in partnership with the Australian Geographic Society in October 2017.

STORY BY JESS TEIDEMAN

Travel



AUSTRALIAN GEOGRAPHIC
SOCIETY EXPEDITION



Snorkellers get some final safety tips on the lowered platform at the back of the boat before moving over the reef.



FOR MOST VISITORS to our greatest natural icon, interactions with the Great Barrier Reef (GBR) take place on day trips out of major tourist hubs such as Cairns, Port Douglas or Airlie Beach, further south. But for a deeper connection with the ebb and flow of daily life on the region's myriad coral reefs and islands, a ship-based multi-day adventure is a worthwhile option.

It's mid-November and I'm aboard the 35m *Coral Expeditions II*, which will be my floating home for the next few nights. I had embarked 24 hours earlier in Cairns, from where we sailed 175km north to moor off Cooktown for our first night aboard.

British explorer Lieutenant James Cook found safe harbour here following a near-fatal encounter with the reef to the south on 10 June 1770. After sustaining serious damage to HMB *Endeavour*'s wooden hull, Cook and his crew careened their broken vessel, intentionally running it aground six days later in the mouth of what is now known as the Endeavour River. They then spent seven weeks repairing the damage, replenishing their food and water supplies, and caring for their sick. They are said to have

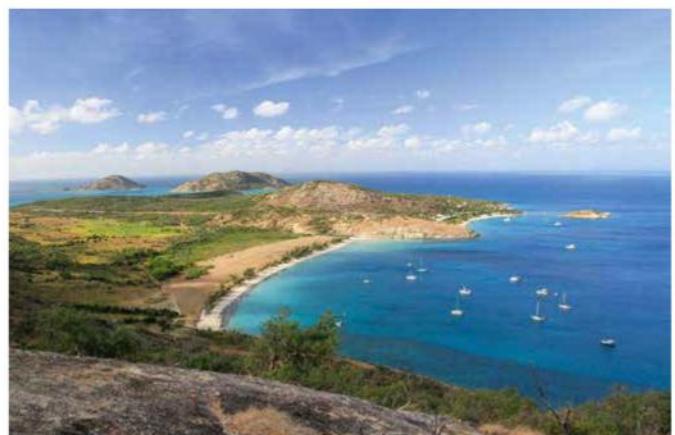
named the place Cook's Town and today it boasts relics and monuments celebrating the event. We have ample opportunity to visit these and this tropical town's other attractions.

From Cooktown our journey continues north-east to reach Lizard Island, where we will finally enter the water for the first time. Lizard is a continental island surrounded by fringing reef about 33km off the coast of Cape Flattery. Much of the island is covered in rolling grassland and dense eucalypt and acacia woodlands that sprawl all the way down to pink-grey granite rocks on the shoreline. There are also paperbark and pandanus swamps nourished by rainwater that accumulates underground in the valley behind Watsons Bay, where our ship has anchored at a permanent mooring established for the exclusive use of Coral Expeditions' vessels.

Nervous excitement ripples through the passengers as we climb into the ship's tender and head ashore. The water here is crystal-clear, warm and still and we hurriedly pull on our snorkelling gear before stepping out from the beach, impatient for that first view of the world beneath the water's surface.



Hikers congregate on the peak of Cooks Look, Lizard Island's highest point, after a tough one-and-a-half-hour pre-dawn ascent.



Watsons Bay, where our ship pulled in to anchor at a permanent mooring established for the exclusive use of Coral Expeditions' vessels.



A giant clam is flanked by blue starfish in the clam gardens of Lizard Island.



The fringing reef around Lizard Island is perfect for gentle snorkelling.

Suddenly, there it is! We're surrounded by vibrant pulsating reef and I don't know where to look first. A greenfin parrotfish lazily swims up to gnaw at coral. I startle a common octopus climbing a boulder-sized coral, its pale camouflage changing to angry maroon, warning me to stay away. Sea cucumbers wriggle across the sand between brightly coloured starfish. A spine-cheek clownfish pokes out from a crevasse in the hard corals as soft corals dance in the underwater currents, polyps extended, feeding on phytoplankton.

IT'S WELL BEFORE sunrise when, on Day 2, moored off Lizard, we head ashore again for a three-hour hike up to 359m-high Cooks Look, the island's highest peak. Cook climbed here in 1770 to plot a course north through the maze of reefs confronting him. Our walk begins on Watsons Bay beach but it's no idle stroll as we zigzag across the steep north-west side of the peak.

We scramble over granite slabs, and push upwards on a tough climb over loose rocks and rough steps. At last, we sign the guest book at the summit and enjoy the impressive view, as the sun moves between clouds, its bright light exposing the colours of

A greenfin parrotfish lazily swims up; I startle a common octopus climbing a coral.

the reef around the island. We head back down to the ocean for a cool reprieve at our second snorkelling site – the island's famed clam gardens.

The deeper waters of the reef system here are a haven for giant clams, some with shells so huge that they've become substrates for corals, sea squirts and smaller boring clams. Some individuals of the larger of the two giant species, *Tridacna gigas*, are so big their gaping mantles can't close.

While the fringing reef is spectacular, I'm looking forward to the next stop on our itinerary: the GBR's outer ribbon reefs. ▶



▲ Passengers look through the glass-bottom tender to the reef below before getting a more close up view while snorkelling.



▲ Our own on-board expert about life on the reef, marine biologist Evie Callendar (at right), secures our glass-bottom boat on Sudbury Cay.



The rest of the world seems far away during sunset drinks on the low-lying sandy surface of Sudbury Cay.

WE PILE BACK onto *Coral Expeditions II* and four hours later are once again pulling on fins, masks and snorkels as we prep for our first outer reef experience – exploring Ribbon Reef No. 9.

This is one of 10 ribbon reefs fringing the edge of the continental shelf here for 100km. Ribbon reefs stretch along the eastern edge of the GBR, between Fraser Island in the south and Cape Tribulation to the north.

Between them are narrow passages of ocean hiding deep expansive bommies – submerged offshore reefs that have been built up over millennia and in some places reach down as deep as 40m. The uppermost living layers of the ribbon reefs are shallow, just five metres below the surface.

The hard corals here are particularly vibrant, and, in a downward cascade from the edge, different species jut out at different angles in a never-ending, slow-moving competition for sunlight. Brightly coloured bumphead parrotfish move between schools of black surgeonfish that swim erratically from coral to coral. The underwater current here is stronger than around Lizard Island and I relax against the pull and push of the shallow surface waves as I watch the softer corals sway.

Next morning, as I head down from the upper deck to board the glass-bottom boat, I turn to the bow and see nothing but blue touching blue on the horizon. I begin to appreciate the GBR's size and just how far from the coast we are. I can see where the outer ocean meets the reef's eastern edge, creating a wall of white

Escape Reef is filled with valleys of giant boulder corals the size of VW Beetles.

waves, a sight that at more than 65km from the coast is inaccessible to day-tour vessels.

Our glass-bottom tender has been specially designed to launch directly off the back of the boat and it takes a group of us, along with on-board marine biologist Evie Callander, over Ribbon Reef No. 3.

Evie deftly steers us over a variety of corals, seaweeds and anemones, identifying each species as we cruise along on our own personally guided tour, receiving a privileged expert perspective on the life sprawling beneath – a perfect teaser before we enter the water ourselves.

Later that day we head south to Escape Reef – and as we slip into the water it soon becomes clear that this is going to be the most stunning experience of what has already been a trip full of spectacular scenery and unique adventures.

Escape Reef is filled with valleys of giant boulder corals the size of VW Beetles. Between them, massive staghorn corals form expansive forests and small fish dart rapidly in and out of their



◀ Our writer, Jess, has a memorable encounter with a large (and surprisingly heavy) pineapple sea cucumber.

▼ The diversity of coral species living on the outer reef creates a spectacular kaleidoscope of colours.



branches. On the side walls of the reef, huge honeycomb corals grow sporadically between equally large brain corals and smaller cabbage corals.

Back on board our boat, Evie has arranged some weird and wonderful things for us to explore up close in an on-board touch tank. She introduces us to starfish, sea sponges and dead coral. I am handed a pineapple sea cucumber, which, to me, looks nothing like the tropical fruit and more like something out of a B-grade sci-fi film.

I brace myself for what I assume are hard protrusions covering it, but am surprised, not only by their softness, but also by how heavy the sea cucumber is. It uses its tubular feet to 'walk' along my forearm and I worry I will drop it as it shuffles forward. Once everyone has taken a look, the on-board visitors are returned to the sea floor and we pull up anchor to begin the overnight journey back to Cairns.

As we disembark, I'm acutely aware that I am truly privileged to have experienced not only being on the GBR, but meeting and sharing the experience with a diverse group of new-found friends. As I head for the airport – with sand still in my hair and salt water caked on my skin – I know it has been an experience I will never forget.



GREAT BARRIER REEF EXPEDITION

The AG Society has joined with Coral Expeditions to create a hosted expedition specially designed for our members.

On this exciting expedition you'll discover the history of Cooktown and the natural beauty of remote Lizard Island, as well as the wonders of the Great Barrier Reef – both above and below the surface. AG Society host Cornelia Schulze will lead you to the lesser known ribbon reef systems of the GBR's north-east, which are not easily reached by day boats. You'll travel with fellow Society members who share your sense of adventure and exploration – all in style aboard Coral Expeditions II.

DATES: 30 October – 6 November 2017

ROUTE: Cairns – Lizard Island – Hinchenbrook Island – Cairns

DURATION: 8 days

COST: From \$3395pp

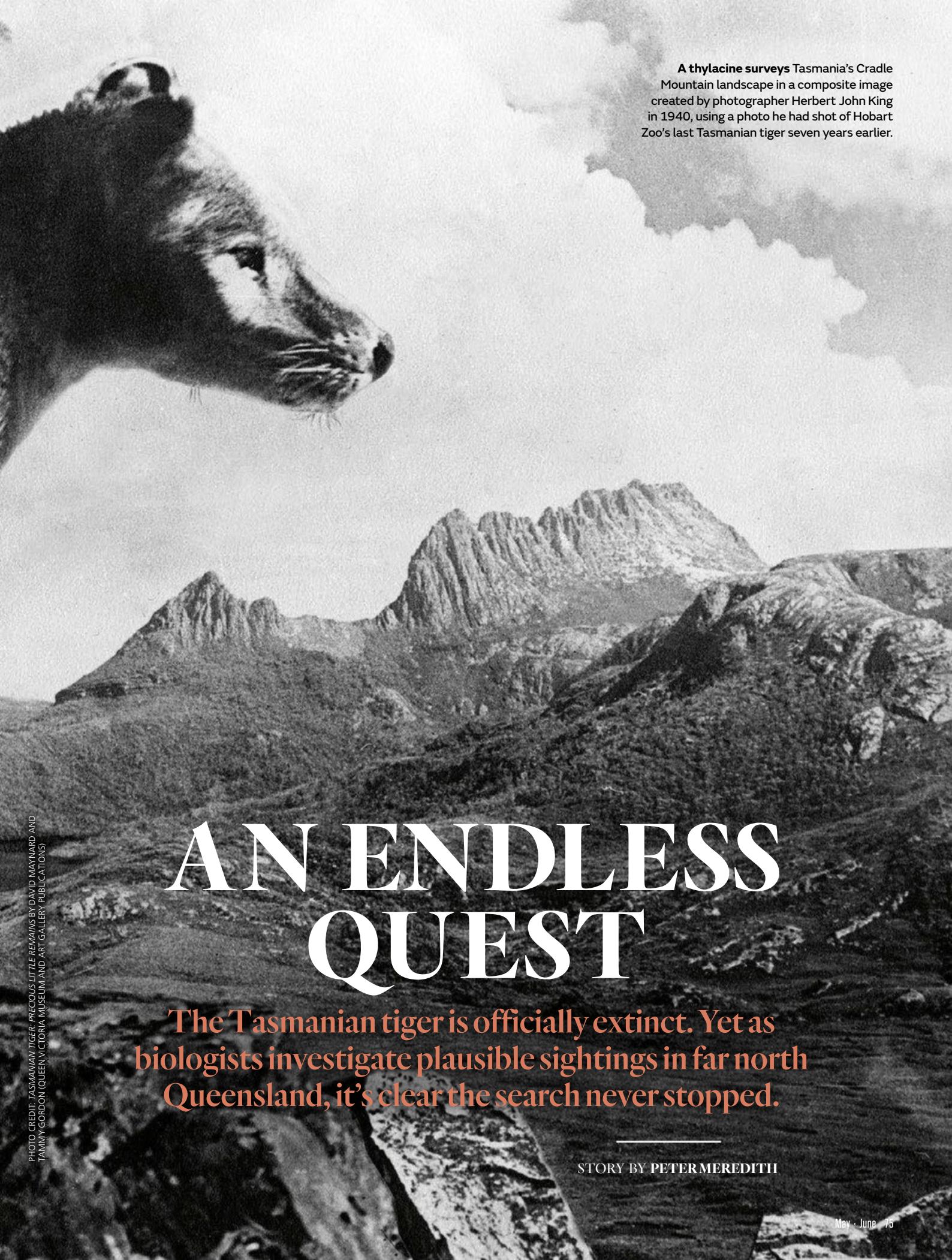
BOOKINGS: Call 1800 079 545, email cruise@coralexpeditions.com or visit coralexpeditions.com

ITINERARY

- Day 1** CAIRNS – COOKTOWN
- Day 2** COOKTOWN – LIZARD ISLAND
- Day 3** LIZARD ISLAND – RIBBON REEFS
- Day 4** RIBBON REEFS – ESCAPE REEF
- Day 5** ESCAPE REEF – SUDBURY CAY
- Day 6** HINCHINBROOK CHANNEL – DUNK ISLAND
- Day 7** DUNK ISLAND – NATHAN REEF
- Day 8** FITZROY ISLAND – CAIRNS

*Itinerary subject to change depending on weather conditions.





A thylacine surveys Tasmania's Cradle
Mountain landscape in a composite image
created by photographer Herbert John King
in 1940, using a photo he had shot of Hobart
Zoo's last Tasmanian tiger seven years earlier.

AN ENDLESS QUEST

The Tasmanian tiger is officially extinct. Yet as biologists investigate plausible sightings in far north Queensland, it's clear the search never stopped.

PHOTO CREDIT: TASMANIAN TIGER: PRECIOUS LITTLE REMAINS BY DAVID MAYNARD AND TAMMY GORDON (QUEEN VICTORIA MUSEUM AND ART GALLERY PUBLICATIONS)

STORY BY PETER MEREDITH

Zoologist John Gould published this illustration of thylacines in his 1863 book *The Mammals of Australia*. He predicted the species' imminent extinction.



AT ABOUT NINE O'CLOCK on a 1993 spring night, a truck was travelling eastwards along the Lyell Highway through the Tasmanian Wilderness World Heritage Area. Half a kilometre past the Franklin River bridge, the driver^{*} negotiated a bend and then a rise. At the top of the rise, his headlights lit up the dead-straight roadway as bright as day.

That's when he saw it. As he reported the next day, a dog-like animal was crossing the road about 100m ahead. Coming closer and slowing down, he noticed dark vertical stripes on its brown body. In the driver's mind there was no doubt: it was a Tasmanian tiger, a thylacine. But was this possible? The species – the world's largest marsupial carnivore of recent times – was officially extinct.

Before the truck reached it, the animal turned back to the roadside. The whole sighting lasted perhaps six seconds. Fast-forward to 2016. I'm standing where, according to the truck driver, the animal left the road. Behind me is dense bush; in front, on the other side of the road, is a sweep of button grass plain called Wombat Glen. Beside me is Nick Mooney – lean, grizzled, ebullient and eloquent.

Nick was a wildlife officer for the Tasmanian Parks and Wildlife Service until 2009 and is now an independent wildlife biologist. He has investigated thylacine sightings

for 35 years and is an acknowledged authority on the species. The truck driver's sighting was one of his cases.

"He was a normal truckie without the slightest vested interest in faking it," Nick says. "He was totally convinced about what he saw and thought we should know."

After visiting the site with the driver, Nick returned with a dog, with which he retraced the mystery animal's steps to calculate how long it was in the truckie's sight.

"His reported timing almost exactly matched what I worked out with the dog. That shows he was a good observer and hadn't exaggerated," Nick explains.

The sighting followed a familiar pattern. Most sightings happen at night and on roads, because roads attract animals and these days there are more people on roads than in the bush. They usually happen as a vehicle rounds a corner, catching an animal by surprise. Many reports are unconvincing, but a few give the experts pause. In March, biologists from James Cook University announced a new study to investigate two plausible sightings in Cape York, raising the tantalising possibility that a thylacine population survives on the mainland.

The Franklin River area produced several reports in about 1990, Nick says. "There were four or five on this stretch of road. There was a truckie, a tourist, a guy on a motorbike early in the morning... They didn't know each other, which adds credibility. One can be sensibly sceptical but I'm always reluctant to dismiss any half-decent report." ▶

* LIKE MANY PEOPLE WHO REPORT SIGHTINGS TO AUTHORITIES, THIS WITNESS WANTED TO REMAIN ANONYMOUS.



Biologist Nick Mooney sets up a trail camera in bushland for one of his regular Tasmanian wildlife surveys. Nick, a thylacine expert, has been investigating sightings for 35 years.

This skull – photographed from different angles – and jawbones of a thylacine were donated to the Queen Victoria Museum and Art Gallery, Launceston, in 1903. The museum's curator at the time, Herbert Scott, cut it open to compare the animal's brain size with that of a dog. He found it to be smaller.



THE EXTINCTION OF the thylacine was the tragic climax of a clash between Tasmania's European colonists and an ecosystem they seriously misunderstood. Conventional wisdom has it that by 1803, when the first settlers arrived on the island, thylacines had already been extinct on the Australian mainland for some 2000 years. Nick Mooney estimates there were about 2100 on the island, and colonists didn't come into contact with them until 1805, when a pack of dogs killed one.

From then on this so-called Tasmanian wolf or hyena instilled an irrational fear in residents, mostly arising from their total ignorance of the animal. They saw it as a mortal danger both to livestock – mainly sheep – and themselves. So they began savagely evicting it from its ancient habitat – shooting, snaring, poisoning and trapping it.

By 1909 thylacines were scarce, the slaughter having been hastened by a government bounty scheme that paid out on 2184 carcasses. The last to be killed in the wild was shot in 1930 by farmer Wilf Batty. The last one caught in the wild was sold to Hobart Zoo in 1933. It died there on 7 September 1936 and was thought to have been the last of its kind. In 1982 the International Union for Conservation of Nature declared the thylacine extinct and in 1986 the Tasmanian government followed suit.

But that's not the last chapter in this sorry saga. Nick Mooney says it's "entirely possible" 100 or more thylacines may have survived in the wild after 1936. A 2016 study published in *Australian Zoologist* concludes that some may have been around through the 1940s and perhaps



▲ Farmer Wilf Batty shot a thylacine in his yard in May 1930, believing it to be after his chickens. It was the last recorded killing of a thylacine in the wild.

later. Since then sighting reports have continued – more than 900 since 1936 in Tasmania and reputedly a similar number from the mainland. Interestingly, most mainland reports are from the south-east and far south-west.

People who report sightings come from all walks of life and many have little prior knowledge of the creature they say they've seen. Few seem to have an ulterior motive for making a false report, such as a desire for fame, money or to perpetrate a successful hoax. They genuinely believe they saw a Tasmanian tiger.

Continued page 82 ▶



Last of his kind

Another thylacine myth is laid to rest.

ALTHOUGH THE LAST captive thylacine was recorded as being named Benjamin, it seems this wasn't the case.

A man named Frank Darby claimed in 1968 that he had been a keeper at the zoo, cared for Benjamin and had given him the name. However, two former zoo employees said Darby had not worked there and the thylacine had never been called Benjamin. Even so, the name stuck.

The animal died on 7 September 1936 in Hobart Zoo, reportedly

Images of captive thylacines show these usually active hunters lying idly or pacing in distress. 'Benjamin' (right) was the last to die in captivity.

succumbing to cold on the bare floor of his open-air cage after being carelessly locked out of his sleeping den for several freezing nights.

The last captive thylacine to die overseas did so in 1931 in London Zoo. It was a female and one of 17



Tasmanian tigers that had been displayed there. In all, 28 thylacines were exported from Tasmania to foreign zoos between 1856 and 1926, according to Dr Eric Guiler, a former University of Tasmania zoologist, who died in 2008.



PHOTO CREDIT: THIS PAGE: CHRIS LANE / FAIRFAX; OPPOSITE PAGE: TASMANIAN TIGER: PRECIOUS LITTLE REMAINS BY DAVID MAYNARD AND TAMMY GORDON (QUEEN VICTORIA MUSEUM AND ART GALLERY PUBLICATIONS)



The skinned, preserved body of a thylacine (left) is prepared for display at the National Museum of Australia in 2005. Until then it had been held at the Institute of Anatomy, whose director, Sir Colin MacKenzie, collected it in 1930. Sixteen-year-old Clem Penney (above) shows off the thylacine he shot near the Arthur River, in north-western Tasmania, in 1924.

First contact

The thylacine's fate was sealed soon after Europeans settled in Australia.

THE EARLIEST REPORT of contact between settlers and the thylacine appeared in Australia's first newspaper, *The Sydney Gazette and New South Wales Advertiser*, on 21 April 1805, two and a half years after colonists arrived in Tasmania. It encapsulated the mindset that led to the animal's slaughter in a frenzy Nick Mooney calls "European predator hysteria": "An animal of truly singular and nouvel [sic] description was killed by dogs the 30th March on a hill immediately contiguous to the settlement of Yorkton, Port Dalrymple; from the following minute description of which, by Lieutenant Governor Paterson, it must be considered a species perfectly distinct from any of the animal creation hitherto known, and certainly the only powerful and terrific of the carnivorous and voracious tribe yet discovered on any part of New Holland or its adjacent islands."

In 1863, the naturalist and artist John Gould predicted the thylacine's fate: "When the comparatively small island of Tasmania becomes more densely populated, and its primitive forests are intersected with roads from the eastern to the western coast, the numbers of this singular animal will speedily diminish, extermination will have its full sway, and it will then, like the Wolf in England and Scotland, be recorded as an animal of the past..."



▲ Bushman Albert Quarrell is thought to have sold this tiger he killed in Tasmania in 1911 to photographer Charles Brown for £5 (\$562 now).





Surrounded by pertinent memorabilia and relics, author and thylacine 'true believer' Col Bailey is in his element in the Tasmanian Museum and Art Gallery, Hobart.

Aside from these many one-off witnesses, there are a number of dedicated tiger-seekers, both in Tasmania and on the mainland, who spend a lot of money and time searching for what has become one of the world's legendary creatures. A proportion of these can be said to be 'true believers' who have absolutely no doubt the tiger is alive. Some say they have seen it; others believe they have been close, either because they have smelt its pungent scent or heard its unusual calls. All hope that incontrovertible proof of the tiger's continued existence will one day surface. And the best proof would be a live animal.

The doyen of the true believers is Col Bailey, a retired landscape gardener, life-long bushwalker and canoeist and author of three books about the thylacine. His most recent, *Lure of the Thylacine*, was published in 2016. Col is almost 80. When I meet him in Hobart at the Tasmanian Museum and Art Gallery (TMAG), site of one of the world's largest thylacine collections, he says that after 50 years of searching for the tiger, it's time to hang up his bushwalking boots. But he's not short of energy for talking.

He recounts that, in 1967, at the age of 30, he was canoeing on South Australia's Coorong wetlands system when he spotted a dog-like animal on a beach 200m away. It had a heavy head, low-slung body and long tail that seemed to drag on the sand. "I thought, what is that thing?"

he recalls. "To this day I'm not sure what it was. But it got me interested enough to inquire about it."

Col's investigation pointed to the thylacine and he's been researching and seeking it in Tasmania ever since. Stories of old-timers who were acquainted with the tiger provide material for his books. So do his own bush experiences, including a claimed sighting in 1995 while he was camping in remote south-western Tasmania.

It happened one morning while he was having "a quiet snoop around" after hearing strange calls. At one point he saw what looked like a feral dog, but then he followed it and got a better view. "I attracted its attention and it turned to look at me," he says. "My eyes ran down its back and I saw those stripes near its tail. I knew then what it was."

Col has been on a half-century quest to prove the thylacine exists. So far, like every other searcher, he's failed to come up with watertight evidence. But he's unfazed. "I can't prove it exists and the sceptics can't prove it doesn't exist," he says. "It's definitely still there. I know." And that's enough for him.

Proof and its absence are a recurring theme in an 80-page book, *Magnificent Survivor – Continued Existence of the Tasmanian Tiger*, originally published in 2004 and available free of charge online. Its author is 'Tigerman', a Tasmania-based thylacine researcher who insists on

He believes that about 200 Tasmanian tigers exist in three separate groups on the island.

anonymity. He describes himself as a greenie, an egotist and a dreamer.

As the book's title proclaims, it is an undisguised attempt to prove that the thylacine survives. It's based on research the author says he carried out over six years.

In the absence of absolute proof that the thylacine exists today, Tigerman harnesses 'sub-proof' – such as footprints, tail drag marks, cave lairs, scats and prey carcasses – to make his case. He believes about 200 Tasmanian tigers exist in three separate groups on the island, 100 in the south-west, 70 in the north-west and 30 in the north-east.

"It is almost extinct, but not quite. I know that because I have seen two," he writes. But, he adds, "society will not protect an animal it thinks is extinct. If the Tasmanian tiger is to survive, someone must prove it exists..."

In the Blue Mountains of NSW I visit the book-crammed home of Mike Williams, a fast-talking bundle of infectious exuberance. Though a mainland, he's been searching for thylacines in Tasmania since the early 2000s. His interest was originally an offshoot of his fascination with so-called cryptids, creatures that cryptozoologists believe exist but that have not been proved to do so. It's a fascination he shares with his partner, journalist Rebecca Lang, with whom he produced and published a book in 2010 about mysterious big cats reportedly roaming the Australian bush.

"While we were investigating big cats we started to get reports about thylacines," Mike says. "We went to Tasmania and I spoke with Col Bailey initially, then with others, and heard of some interesting and even bizarre sightings by really good witnesses. Not all of them are deluded or demented. That started me on my hunt for the tiger."

Mike began following up sightings. He has made numerous trips to Tasmania, four of them for major expeditions. He has a fifth expedition planned for 2017. "I will chase up more witness reports and set up three to five cameras at different sites and come back and check them later," he says.

Although he doubts the thylacine survives on the mainland, he's sure it does in Tasmania and believes that sooner or later a dash cam on a local's car or a camera trap in the bush will confirm this. "I am convinced it's out there, otherwise I wouldn't waste my time," he says.

In 2014 Mike and Rebecca published a book of essays by different authors entitled *The Tasmanian Tiger: Extinct or Extant?*

Him or her

A Tassie tiger's pouch may not only have been a place for carrying babies.

THE WORDS in the thylacine's scientific name, *Thylacinus cynocephalus*, mean "pouched" and "dog-headed". Its closest living relatives are numbats, quolls and Tasmanian devils. As with quolls and devils, the female thylacine carried her developing young in a backward-opening pouch. This orientation prevented the pouch from snagging on branches or twigs as the animal moved through dense bush.

Pouch young, up to four at a time, emerged half-grown after four to five months, by which time the pouch was hanging almost to the ground. The male thylacine had a backward-opening pouch, too, though it was more a partial or pseudo pouch. The male was able to draw his testes up into it either to protect them or possibly to regulate their temperature.

The male pouch was central to a dispute about the gender of the last thylacine to die in captivity – popularly known as Benjamin (see "Last of his kind"). Australian naturalist David Fleay took the last still photographs and a movie clip of the animal (getting bitten on the backside in the process) and a cursory viewing of the images and film reveals no male genitalia. In his book *The Last Tasmanian Tiger*, published in 2000, author Robert Paddle claimed Benjamin was in fact female.

However, in 2010, Dr Stephen Sleightholme of the International Thylacine Specimen Database project examined Fleay's movie frame by frame and in one sequence found that the pouch contained proof of Benjamin's masculinity. His finding was published in *Australian Zoologist* in 2011.



▲ This display of a female thylacine and four pouch young at the Tasmanian Museum and Art Gallery was destroyed in about 1935. The animals were killed in 1884.

Bill Flowers, an artist and member of the three-man Thylacine Research Unit, studies a replica thylacine skull at his home in Devonport, Tasmania. In the foreground is a drawing he produced from an eyewitness report of an encounter with a tiger.



THYLACINE SIGHTINGS HAVE been reported in all mainland states, but Victoria is a hotspot. One Victorian who's contributed his fair share is Murray McAllister, a physical education teacher at a Melbourne secondary school. In 1998 he was writing a novel about some children trying to prove the tiger was alive. While researching his topic, he learnt there had been 54 thylacine sighting reports from Loch Sport, a small township on the Gippsland Lakes.

"I decided to live the dream of the children in my novel," Murray tells me. "I was going to prove to the world that those animals are still there after decades of presumed extinction."

"I decided to go down there. On my first visit I stayed three days and had my first sighting. So it was destiny. I thought if I kept going there I'd eventually get what I was after."

Murray says he's seen the thylacine 20 times since then and almost trapped it once. Even so, he feels his dream has only partly come true because, despite leaving five top-of-the-range cameras in the bush for months, he hasn't captured a convincing image of his quarry.

Murray believes the only answer is to catch one. "Then I'll build a cage around it, take hundreds of photographs and lots of video, get hair samples and video myself releasing it," he says. "That'll be the evidence I need."

In Toolangi, about 35km north of the school where Murray teaches, lives Bernie Mace, a former industrial scientist with a lifetime interest in natural history. While working in Tasmania in 1966–69 he heard what he believes are credible reports of thylacine sightings.

"I'd gone there convinced the thylacine was extinct," Bernie says. "But those reports persuaded me it might still be around. That was the beginning of my journey."

On returning to Victoria, Bernie began hearing reports of sightings in his home state, particularly in East Gippsland. Ever since, he has been following up the better reports in Victoria as well as other states including Tasmania. "I've been developing long-range spotlights and investing in night-vision goggles," he says, "and I have half-a-dozen motion-sensor cameras."

He's writing a book about his 50 years of thylacine research and is reluctant to reveal too much before publication. However, he hints that it will contain key evidence about the thylacine's survival: "I've heard vocalisations over the years that convinced me something unusual was around."

HOPE IS THE fuel that powers all true believers. But not only them. Among tiger-seekers there are some who are not sure if the animal survives. They keep an open mind and are more likely to question evidence. Even so, they allow themselves to hope now and then. Interestingly, so do many sceptics.

Bill Flowers was a sceptic once. A mountain of a man with a measured manner of speaking and a torrent of



▲ **Thylacine searcher** Mike Williams adjusts a trail camera on a 2015 Tasmania expedition. Although a mainlander, he's investigated sighting reports on the island for almost 20 years.

grey hair, Bill is a member of the Tasmania-based Thylacine Research Unit (TRU). The three-man group aims to apply a scientific approach to evidence and embraces technology such as night-vision gear, trail cameras, listening devices and drones. It maintains a website where the public can report sightings.

Bill is an artist, filmmaker, herpetologist and wildlife carer with a particular interest in Tasmanian devils. The other TRU members are Chris Coupland, a zoologist, conservationist and filmmaker, and Warren Darragh, an IT professional and former telecommunications officer with the Australian Army.

Bill says the trio started out by investigating and debunking myths about the tiger. All were initially sceptical about the animal's survival, but then Bill had a

If thylacines were around in the 1980s, they could have survived till the 21st century.

couple of experiences that punctured his conviction. One was hearing a mysterious animal call in prime thylacine habitat while investigating a sighting report in 2015. The other was seeing a plaster cast reportedly made in the 1980s of a young thylacine's footprint. In appearance it matched almost exactly a sketch he'd made of a thylacine foot in the TMAG.

If thylacines were still around in the 1980s, they could have survived till the 21st century, Bill reasons. "That was earth-shattering for me," he says.

Not that he's now a true believer. "I err on the side of probable extinction. Most likely they're extinct, but there's a chance they're not." ▶

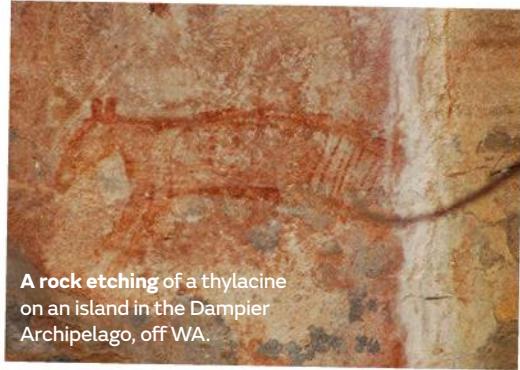
Long lineage

This meat-eating group of marsupials first appeared millions of years ago.

THE THYLACINE WAS the last member of a family of ancient dog-like carnivorous marsupials that survived to modern times. The history of the thylacine goes back 30 million years and more than half-

a-dozen species once lived in Australia and New Guinea. They apparently became extinct on the mainland 2000 years ago, possibly due to competition from dingoes.

Tasmanian Aboriginals, who called thylacines coorinna, laorinna, lagunta or laoonana, are believed to have hunted the animal occasionally. In their book *Tasmanian Tiger: Precious Little Remains*, authors David Maynard and Tammy Gordon suggest that by conducting regular burnings, the Aboriginals created a landscape that attracted herbivores such as



A rock etching of a thylacine on an island in the Dampier Archipelago, off WA.

wallabies and kangaroos, providing a food supply for both themselves and the thylacines. So, by forcibly removing most Aboriginals from Tasmania by 1835, European settlers hastened the thylacine's demise.

SO, ARE THEY unquestionably extinct? Or might a few be holding out in remote bushland somewhere? Unfortunately, despite the hopes, dreams and prodigious efforts of a surprising number of people, there's not a shred of conclusive proof of this possibility – no convincing photographs or video, no verifiable footprints and no roadkills.

"Nowadays fast roads go through just about all the high-quality thylacine habitat and there are plenty of reported sightings, so we should have had a roadkill by now," Nick Mooney says.

Kathryn Medlock, senior curator of vertebrate zoology at TMAG in Hobart, agrees. Even though there are more people in Tasmania than ever and hundreds of remote cameras (up to 500 by some estimates) operating in the bush at any one time, none have come up with any convincing evidence, she says.

"All the fauna people do their surveys using remote cameras," Kathryn explains. "They'd be the first to say if they'd photographed a thylacine. There are hundreds of thousands of roadkills every year but none of thylacines. There's not even a manky skeleton that's been lying beside a road for 20 years."

Tammy Gordon, the collection officer at the Queen Victoria Museum and Art Gallery in Launceston and co-author of the book *Tasmanian Tiger: Precious Little Remains*, says no thylacine has been brought to the museum in the past 80 years. "The museum has a file of sightings dating from the 1930s, but in the 30 years that I have been here I have not seen anything I would consider evidence."

And yet the search goes on. Why? Are tiger-hunters deluding themselves? Are the true believers too starry-eyed to face the facts? What drives them?

Some searchers may have quite basic motives, such as a desire for fame, notoriety or fortune. Others say they love the bush and that looking for the thylacine gives them a good excuse to be in it. But a number raise more complex issues. "By searching for this animal I feel I'm hon-

ouring its existence," Mike Williams says. "We treated it savagely, we did horrific things to it, but if we find it we'll know we haven't destroyed it and could say we humans aren't as bad as we thought we were. It would be a form of redemption."

Eric Schwarz, a senior wildlife management officer in Tasmania's Department of Primary Industries, Parks, Water and Environment, agrees. "There's definitely an element of guilt in this," he says. "I think people hope that a wrong will be righted by the knowledge that we didn't exterminate it. It's almost as if we'd be exonerated."

After 35 years of thylacine work, Nick Mooney remains open-minded. "It could be out there, but it's unlikely," he says. "On Mondays, Wednesdays and Fridays I think it's there, on other days it's not. If somebody found one, I would be elated but not surprised. Perhaps we haven't found it yet because we are simply much less good at finding very rare things than we think we are."

Kathryn Medlock would be overjoyed if one were found. But she's not optimistic that government bodies or the public would ever hear about it because most tiger-searchers insist they'd tell no-one if they were successful. And that means the myth of the thylacine's survival will probably never die and the hunt will go on forever.

In 1986 AG 3 carried an 18-page feature about the Tasmanian tiger written by Andy Park. In it he quoted Michael Archer, currently a professor at the University of NSW School of Biological, Earth and Environmental Sciences, and a former director of the Australian Museum, where he became involved in a plan to clone the thylacine. The belief that the species survived, Michael told Andy, was "a stunning example of over-optimism".

But 30 years on, Michael wrote the foreword for Col Bailey's latest book and in it he generously praises Col for his absolute conviction that the tiger survives. Then he adds, "With all my heart, I hope he is right." **AG**



The preserved body of a three-month-old thylacine pouch pup in a jar, in the hands of Kathryn Medlock, the Tasmanian Museum and Art Gallery's curator of vertebrate zoology, is a poignant memento of a unique vanished species.

The white-plumed grevillea throws its flowers high so insects and birds can easily find them, but why the flowers smell of old socks is not understood.

Opposite: Hundreds of pale glands in the leaf of a coarse-leaved mallee contain pinene, an aromatic compound common in pine needles, and cineole, a common component of eucalypt leaves.





SMELLS LIKE AUSTRALIA

Close your eyes, let your sense
of smell guide you through
the bush and discover a whole
new world of aroma.

STORY BY TIM LOW

PHOTOGRAPHY BY JIRI AND
MARIE LOCHMAN

O

NE AFTERNOON IN Tasmania, while driving along a back road, I saw something black jump out and slink into a culvert below. A Tasmanian devil!

I pulled over and was quickly at the drain with a torch, peering at a shaggy rear end shuffling away. Racing to the other end I was met by an unhappy face and the damp doggy odour of devil breath and fur. That pungent smell in a tight space made this encounter my defining Tasmanian devil experience. It was probably also the devil's defining moment with a human, with my smell contributing to its experience.

We depend on our eyes and ears outdoors, but our noses can also deliver unique sensations full of insight. From another experience in Tasmania I recall a hillside grazed bare but for large groves of bushes cloaked in white daisy flowers. I entered the paddock, crushed the leaves between my fingers and inhaled their strong musky fragrance. The plants turned out to be dusty daisy bushes (*Olearia phlogopappa*) and I suspect they were thriving because essential oils in their leaves rendered them unappetising to sheep.

A USTRALIA IS RICH in aromatic vegetation, covered as it is with vast tracts of pungent eucalypts and paperbarks. Scented shrubs such as boronias, mint bushes, daisies and more vie for space beneath. Dame Mary Gilmore – the author and poet on our \$10 note – said that Australia smelt like the Spice Islands. “The winds stooped as they passed because of her blossom; ships knew her before they came to her,” she wrote in 1934 in her book *Old Days, Old Ways: a Book of Recollections*.

Australian soldiers after two world wars were welcomed home by eucalypt perfume as their ships approached land. Nineteenth-century medical practitioners attributed a low incidence of malaria and other ‘fevers’ to the healing vapours of aromatic eucalypt groves. Colonial botanist Baron von Mueller called for the construction of mountain sanatoriums where tuberculosis patients could best inhale them.

He believed that “the whole atmosphere of Australia is more or less affected by the perpetual exhalation of these volatile bodies”. The cry went out for a eucalypt to be planted in every garden and the word spread. On six continents, Tasmanian blue gums, whose heady fragrance inspired the loudest claims, won acclaim as ‘fever trees’, ▶

PHOTO CREDITS: CLOCKWISE FROM TOP LEFT: SHUTTERSTOCK; WIKIMEDIA; HANS AND JUDY BESTE; HEATH HOLDEN. SCIENTIFIC NAMES, CLOCKWISE FROM TOP LEFT: *Eucalyptus saligna*; *Eucalyptus*, *Olearia phlogopappa*, *Sarcophilus harrisii*



2



3





1 Australia's woodlands are more fragrant than most in the world because they often contain eucalypts such as these salmon gums with aromatic oils in their leaves.

2 The Tasmanian devil has a pungent smell and uses odours in communication. It will sometimes drag its rear end along the ground, apparently to leave a scent.

3 The dusty daisy bush has strong-smelling leaves as well as pretty flowers, and while the flowers attract insects, the leaf aromas probably repel herbivorous animals.

4 Writer Dame Mary Gilmore portrayed "Australia as she was when she was most Australian", and, for her, the aroma of the bush formed an essential component of that evocation.

1 Colin (at left) and Tobias

Ferguson sniff weeping tea-tree, an aromatic plant they use to combat colds and blocked noses.

2 Native to south-eastern Australia, the blotchy mint bush is a fragrant member of the mint family, along with true mints and other herbs.

The fragrance of the Aussie bush is a statement about plants on poor soils defending themselves with cheap ingredients.



2



and partly as a result of that perception, they are now found widely, from California and China to India and Algeria.

Understanding the chemical source and purpose of aromas can help show us how ecosystems work. For example, the essential oils that give some plants strong odours repel bacteria and fungi, while also deterring grazing mammals and insects. So it's not surprising that eucalyptus oil serves well in toilet cleaners and tea-tree oil is a valued germicide.

Aboriginal healers similarly employed fragrant plants, especially paperbark, emu bush (*Eremophila* sp.) and northern sandalwood (*Santalum lanceolatum*). Even birds use them: eagles and other birds of prey often place eucalypt sprigs in their nests, apparently for sanitation.

Many plants produce chemical defences that are stronger than essential oils. The most potent, including alkaloids, contain nitrogen, an element that is scarce in Australia's infertile soils. Large numbers of our plants rely instead on nitrogen-free defences, including aromatic compounds that typically contain only the three freely available constituents of carbon, hydrogen and oxygen.

These compounds are produced in mixtures that give each plant its own protective bouquet. Because of this, the fragrance of the Aussie bush is a statement about plants on

poor soils defending themselves with cheap ingredients.

The main oil in eucalypts, known as cineole, or eucalyptol, is the source of a liniment smell. Because it is produced by many native plants, including paperbark, mint bush and the liniment tree (*Asteromyrtus symphyocarpa*), it provides the signature smell of the Australian bush. We've employed it in cough lozenges, wound sprays, antiseptics, grease removers and cigarettes. German scientists recently found that it benefits asthma sufferers, which would not have surprised those 19th-century doctors who prescribed eucalypt cigarettes.

Hold the leaf of an aromatic plant to the light and, if it's not too thick, you can usually see the translucent dots of oil glands that release the aromas, sparkling like stars at night (a magnifying glass helps). On some plants, they are so large the leaves look warty. Oil glands can make up to 20 per cent of dry leaf weight, and often leave fingers sticky when foliage is crushed.

Aromas are handy for botanists, who, by crushing and sniffing, can tell if an unfamiliar heathland shrub is a citrus or eucalypt relative and whether a rainforest tree is one *Backhousia* species or another. One orchid, the hooded caladenia (*Caladenia cucullata*), distinguishes itself from the look-alike musky caladenia (*C. gracilis*) by having flowers

3 A multitude of oil-filled glands shows why the oil mallee is a valued source of eucalyptus oil, rich in highly aromatic cineole.

4 This Bosisto Parrot Brand Eucalyptus Oil label is from 1871 but the product is still sold today to help relieve cold symptoms.

3



4



with a citrus smell. Aromas come up in diagnostic keys published in journal articles, for example, to tell one daisy bush from another. In lilly pillies (rainforest plants that are part of the same family as the eucalypt), the density of oil glands is one feature used to separate allied species.

HUMANS CAN REPORTEDLY identify 700 different odours, but that's nowhere near as good as it sounds. We have more trouble putting names to familiar scents than to sights and sounds. The areas of the brain responsible for classifying smell and language don't have strong connections, leaving us without a good vocabulary for smells or an accepted classification system.

This shows through in the inconsistent descriptions of some plants. Sprouting along river flats in coastal New South Wales, for example, the odd-looking incense plant (*Calomeria amaranthoides*) has a smell often likened to bananas, hops and incense, three items that don't smell alike. Chocolate lilies have a delicious scent similar to vanilla, caramel and chocolate, and I am never sure which descriptor fits best. One fungus has a smell that compares with iodine and aniseed. In the same way, wine is described by critics using words such as buttery, earthy, fleshy and jammy, none of which make much literal sense. ▶

OIL ESSENTIALS

In November 1788 1L of steam-distilled oil from

Sydney peppermint gum

leaves was sent to England by John White, surgeon-general to the colony: reportedly the first useful natural product sourced from Australia.

Australia's essential oil industry, based largely on compounds that produce the 'aroma of the bush', continues to grow annually. Today our most successful essential oil is

tea-tree oil.

Each year up to 900 tonnes of pure Australian tea-tree oil are produced and in 2015–16 a total of

620 tonnes

was exported around the globe.





1 **Shield bugs**
and other
stink bugs produce
repulsive odours that
help protect them
by deterring hungry
predators, such as
lizards and birds.

Fortunately, we don't need much skill at naming smells to enjoy them or to use them for identification purposes. Leaves that smell fragrant when crushed declare that a shrub in heathland or coastal woodland is likely to fall into one of just four family groups – those of the eucalypts, citruses, mints or daisies – and knowing that is a boon to identification.

A large number of plants in these groups have acquired telling names. There are eucalypts called peppermints or lemon-scented gums, daisies called curry bushes, kerosene bushes and the fruit-salad plant.

Smells produced by animals don't attract as much attention. Visit a creek on a wet night and any frog-lovers you find will be using calls to identify these amphibians. However, noted Australian frog researcher Mike Tyler says they could be sniffing instead.

"Several frog skin odours are comparable to culinary herbs, but there are others that are more like curry powder," Mike, who is based at the University of Adelaide, explains in his book *Frogs*. "In fact, with a little experience of what different species smell like, a sniff is almost as good as a glimpse as an aid to identification."

If we all had a dog-like devotion to olfaction, our field guides would be telling us that Peron's tree frog smells of citrus while the green-and-golden bell frog is reminiscent of the kitchen herb thyme.

Like plants, some animals use odorous compounds for defence. Many small snakes and freshwater turtles, when handled, will smear you with potent-smelling faeces that make your hands smell awful for an hour or so. Stinkbugs release their foul smell from glands between their front pair of legs.

The larvae of swallowtail butterflies absorb aromatic oils from their food plants and emit them on soft 'horns' known as osmeteria, which protrude above their heads when they're harassed. Orchard swallowtail caterpillars smell of citrus and blue triangle butterflies of camphor.

Fungi can surprise us when, in strange shapes and colours, they are summoned by rain from musty earth or crumbling wood. Their mystique is often enhanced by curious smells that can recall cucumber, radish, garlic, curry, aniseed, apricots, pear drops, fresh flour, cedar, cooked shellfish, urine or ether.

The yellow-staining mushroom (*Agaricus xanthodermus*), which looks inviting enough to have caused many

Why does WA's white-plumed grevillea have flowers that smell like old socks?

poisonings, would bring less strife if heed was paid to its disinfectant smell. Stinkhorns smell like sewage or rotten meat, to attract the flies that spread their spores. Australia also has plants that trick blowflies into spreading their pollen, including stinking lilies (*Typhonium* spp.) in rainforest and, in heathland, stinking roger (*Hakea dentigulata*).

If you're in arid or semi-arid eastern Australia during wet or humid weather and detect an intriguing whiff of boiled cabbage, you can be sure that you're among a stand of stinking gidgee (*Acacia cambagei*) trees.

THE EASIEST WAY to enjoy wild odours is to crush and sniff leaves on walks. The sensation can be dramatic when one anonymous shrub among many releases a burst of aniseed or lemon.

The effect invites curiosity about the plant's identity and the purpose of the smell. There are many plants I greet after an absence by taking a good sniff, including lemon myrtle, celerywood and Tasmanian blue gum. For me, their aromas are central to their identities.

Sniffing vegetation carries little risk, but frogs can be unsafe. Green tree frogs can bring on nausea if you inhale their peanut-butter odour for too long. Theirs is another smell with a story: green tree frogs will rest on your hand rather than leaping off in fear because they have poison glands to protect them, announced by their odour. They smell strongest when stressed.

But many smells remain as mysteries for the keen observer to explain. Why does Western Australia's white-plumed grevillea (*Grevillea leucoptera*) have flowers that smell like old socks? And what exactly does the curry flower (*Lysinema ciliatum*), also growing in WA, attract to its spicy-smelling flowers?

Mysteries like these are guaranteed to keep me sniffing my way through the Australian bush.

2



3



4



PHOTO CREDITS, CLOCKWISE FROM FAR RIGHT: ALAMY. SCIENTIFIC NAMES, CLOCKWISE FROM TOP LEFT:
Lysinema ciliatum; *Agaricus xanthodermus*; *Litoria caerulea*

2 Curry flowers, endemic to south-western WA, have an aroma that vindicates their name. Moths seen at the flowers may appreciate the odour.

3 Frogs often have distinctive aromas; the green tree frog emits a 'nutty' odour before secreting noxious defensive chemicals from its glands.

4 It looks like an edible mushroom, but this yellow stainer has a smell likened to ink, carbolic soap and disinfectant. People who eat it fall ill.

WINTER ON THE BLADE

An AGS-supported climbing expedition takes on the first winter ascent of one of Australia's tallest vertical climbs, on Federation Peak in the remote Eastern Arthur Range of Tasmania's Southwest National Park.

STORY BY OLIVIA PAGE

Australian Geographic Society supported



Mick Wright (at left) and Mark Savage took turns leading the precarious world-first winter-time ascent of Federation Peak's North West Face Direct via Blade Ridge, in Tasmania.





IN THE DARK belly of the Tasmanian wilderness I slip thigh-deep into glutinous, peaty mud. Desperately, I grasp at a slimy tree root, my fingers too numb to feel whether I have a good hold. If I fall I'll be stuck helpless like a turtle on its back and my companion, who's crawling behind, will have to pluck me and my 30kg pack from the vertical entanglement of Moss Ridge.

From its outset, this Winter on the Blade expedition had fallen into the ill-advised category. Now here I am, after hours of struggling to stay upright and moving forward, wondering whether we'll all make it back alive.

OUR INTENT with the adventure was to film a climb never before attempted – the first winter ascent of the North West Face Direct route combined with the Blade Ridge route on Federation Peak. To take on the 640m route was such an immense challenge that outdoor enthusiast Andy Szollosi decided to approach documentary maker Simon Bischoff to film it, and together they set about putting together a team.

The peak is a steep headwall on the edge of a glacial valley in the Eastern Arthur Range in Tasmania's Southwest National Park,

Just months before our Winter on the Blade team set out, an experienced bushwalker had tumbled 150m to her death here.

and is located about 90km south-west of Hobart. It's a 1225m-high, incisor-like, quartzite spire sometimes referred to as Australia's only true mountain. It was first summited in 1949 by a party led by John Béchervaise, an Australian writer and photographer renowned for his mid-20th-century exploits in Antarctica.

Hikers reach the summit via Bushwalkers Route, a deceptive name for a severely exposed and sometimes near-vertical scramble. Barely 100 people make it to the top each year. In early 2016, just months before our Winter on the Blade team set out, an experienced bushwalker tumbled 150m to her death here.

The walk into Federation Peak has the reputation for being Australia's toughest. It is an unmaintained trail that guarantees submersion into thick mud and is lined with dense vegetation that impedes your every step. The walk's allure is further tempered by its exposure to the famously strong Southern Hemisphere westerly winds known as the Roaring Forties. In winter, when consistently wet conditions can flood the rivers here, making them unsafe to cross, it's an even tougher challenge. Despite the risks, Simon and Andy managed to attract five other participants to their expedition – climbers Mark Savage, Mick Wright and Nick Grant, videographer Dan Haley and me, the photographer.

IT WAS THE afternoon of 21 June 2016 – the Winter Solstice – when our team gathered nervously in Andy's living room before finally setting out. Hobart's Derwent River looked distorted through wet window panes and our romantic notion of leaving in the dead of winter was beginning to seem foolhardy. When conditions are good, the Farmhouse Creek Track access to Bechervaise Plateau is manageable. With overflowing rivers and heavy packs, we knew the 21km trek would be a nightmare.

On a reconnaissance trip weeks earlier, volunteers had dropped off 120kg of food and equipment at the plateau. But much of the remaining gear, including 35kg of camera equipment, had to be divvied up between us. Then there were the 3kg of salami, 7kg of cheese and two loaves of halva Andy had packed! Continued page 102 ▶



Olivia Page

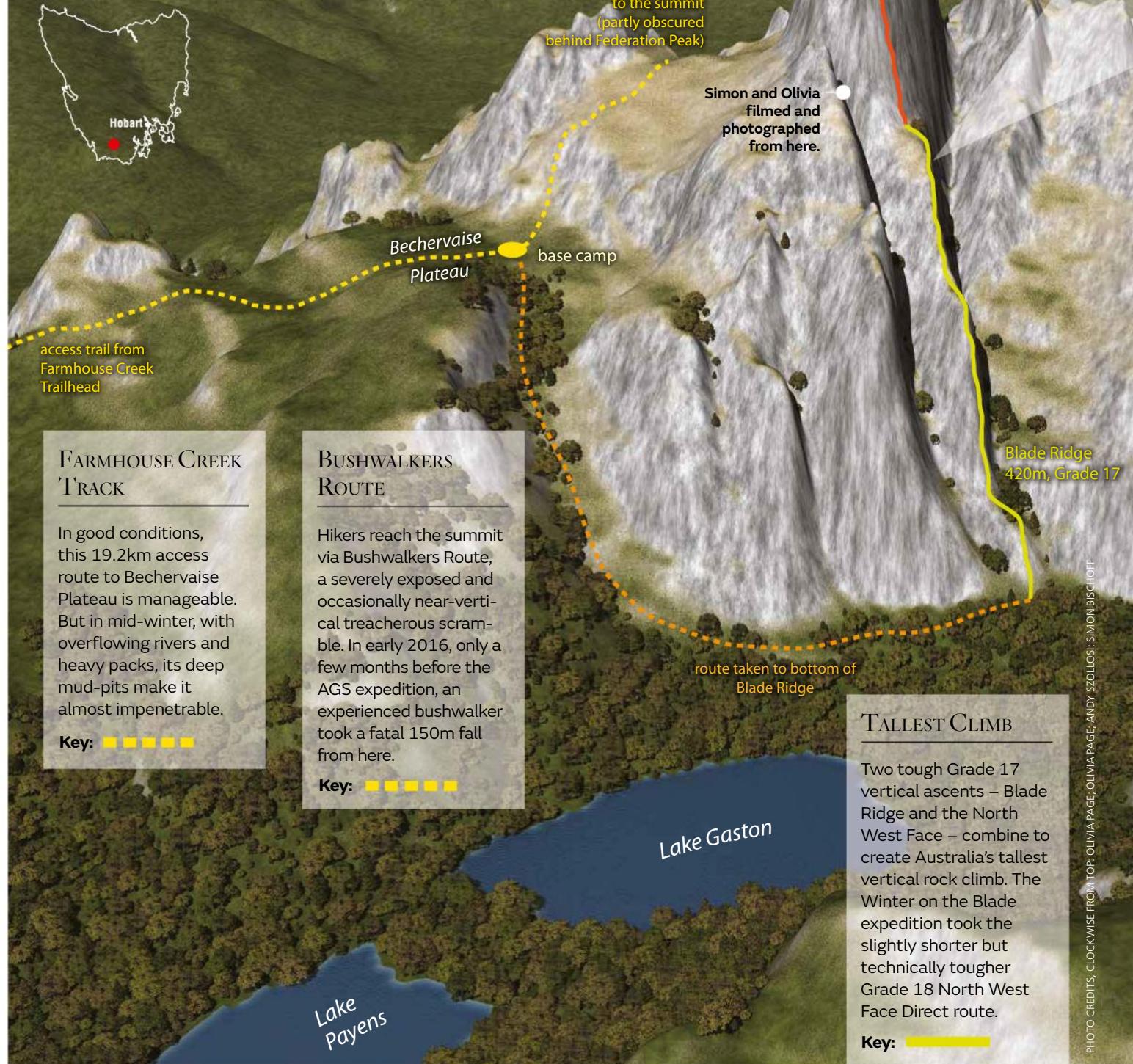
is a documentary photographer. Nature, adventure and travel dominate her work. She was one of three videographers to film the first winter ascent of the North West Face Direct via Blade Ridge, alongside Dan Haley and chief filmmaker Simon Bischoff.



FEDERATION PEAK

It's not the highest mountain in Tasmania, but Federation Peak's sharp spire and high cliffs make it the state's most desirable summit for serious climbers looking for a technical challenge.

CARTOGRAPHY BY ROGER SMITH





Mick Wright on the upper section of the Blade.

Geeves Bluff
1165m

Hanging Lake

BASE CAMP TO BLADE RIDGE

This was a two-hour bush approach to reach the start of the Blade Ridge route up to the peak.

Key: ■■■■■

THE NORTH WEST FACE DIRECT ROUTE

Combined with Blade Ridge, this ascent is just 110m short of being the tallest vertical climb in Australia. This is the first time it has been completed in winter.

Key: ■■■■■

Devils Thumb

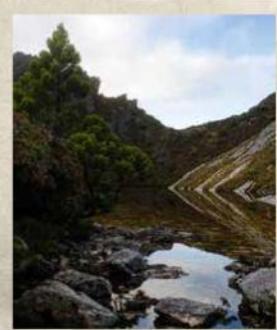


DEVILS THUMB

Along with Geeves Bluff, Devils Thumb is one of several steep peaks in the Eastern Arthurs.

ARTHUR RANGE

This range comprises the Western Arthurs and Eastern Arthurs, of which Federation Peak is the highest peak.



HANGING LAKE

Hanging Lake is among the many features in the landscape here created by past glaciation. There are also moraines and hanging valleys, created by glacial erosion.

Thwaites Plateau



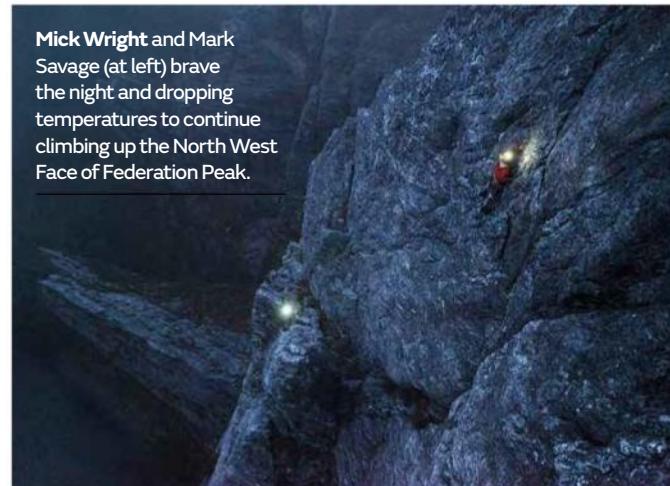
Thwaites Plateau

NORTH



▲ **Simon Bischoff** traverses a slimy log on Moss Ridge. Eventually the team adapted to using micro-spikes designed for ice to stay upright in this slippery forest.

► **Andy Szollosi** at camp, trying in vain to dry the team's gear. Each team member was limited to one set of wet clothes and one set of dry. Sleeping bags succumbed to the relentless moisture.



Mick Wright and **Mark Savage** (at left) brave the night and dropping temperatures to continue climbing up the North West Face of Federation Peak.



Our departure was delayed by a forecast for 80mm of rain and snow down to 600m, but three days later we arrived at the trailhead of Farmhouse Creek Track and I realised what Nick had meant when he'd warned me previously that the word 'track' was meaningless. As first light drifted through the canopy, my mind swam with thoughts of the leeches, moss and swamps ahead of us. But I soon forgot all that as I hoisted my pack – more than half my bodyweight – onto my shoulders.

As we trudged for two days through rain and sleet, we gave up guessing which mud-pits were ankle-deep and which would devour us whole. But, against the odds, rivers were passable, the leeches tolerable and dinners warm enough. The never-ending snakes and ladders of Moss Ridge didn't break anyone's ribs as they'd done on the reconnaissance trip and the mountain drew ever closer until finally we dragged ourselves onto the Bechervaise Plateau, dishevelled but elated. We were relieved to find our supplies safely hidden in the snow.

Next morning, as dew drops woke me, I found my mattress floating and sleeping bag sodden. It had been a grim night, but morning brought unexpected breaks in the cloud and so Simon and Mick headed out to explore. We farewelled them in sunshine but soon it was sleeting. They returned at dusk, traumatised. "Soloing up that slab in snow was one of the scariest moments of my life," Mick said, as Simon explained they'd had to rappel off the mountain by slinging a mound of shards held together with mud.

THE WEEK PASSED in a constant sideways drizzle. We were halfway through our expedition when we found ourselves huddled in a tent around possibly the only flame flickering in the state's entire south-west, waiting for Mick to return from his daily ritual of donning wet boots and sprinting up above the plateau to download weather updates.

Suddenly the zip flew open and Mick burst in, beaming. "We might have a weather window," he said. We agreed to place all bets on this sliver of a chance, although it meant we'd have to stretch food supplies from 12 to 17 days. The remainder of the evening was spent rationing. Unlike Mark, whose lunch on one mountaineering trip had once been the rinsed remains of a Vegemite jar, Mick and Simon struggled with the concept.

And so we waited for our weather window to open. Mornings continued to be bleak with most of us lying in as long as we could, savouring our one daily hot drink. Simon would make the morning porridge, his saturated sleeping bag and deflated mattress having little allure, and would then suck every last calorie from his coffee grinds as Mick licked the cooking pot clean. Our hunger and boredom were slightly alleviated by taking turns playing chess.

Occasionally lukewarm sunshine filtered through the fog and we'd rush out of our tents, feet wrapped in plastic bags and Crocs, cameras in tow. When it lasted we explored Thwaites Plateau, or scaled the peaks behind Hanging Lake to view the columnar cliffs of Precipitous Bluff that tower towards the Southern Ocean. ▶

A crazed wail reverberated up the wall and we knew one of them had slipped.

Dan Haley rappels down the North West Face in search of good filming angles.



◀ **Mark Savage (at left) and Mick Wright made the most of light rains to explore the mountain before their final attempt at scaling Federation Peak.**

The evening was eerily still, even though an Antarctic weather system was blasting.

AS PREDICTED, OUR glorious weather window opened up on day 13 but we made the difficult decision to leave the climb to the next day – our last – on the chance the rock would dry off and the waterfalls would subside. Mark and Mick organised their climbing equipment, Simon pulled the camera gear out of the rice-filled ziplock bags where it had been shielded from the relentless moisture and Andy disassembled the mess tent for reassembly on the summit as a four-person bivvy in case of emergencies.

That night, as we ate dinner beneath a brilliant Milky Way, the team was abuzz with anticipation. We were all acutely aware that 24 years earlier Mark had been part of a team that had failed an attempt to climb Federation Peak via Blade Ridge. And in a shared knowing moment, we embraced in a circle as Mark highlighted our priorities by quoting the famed British climber Roger Baxter-Jones: “Come back alive, come back friends, get to the top. In that order.”

As we went to bed below the mountain, a blanket of ice crystals grew over the camp, and I awoke before dawn to a bitterly cold but beautiful winter wonderland, with frost everywhere and frozen socks thawing atop the steaming coffee pot. At 6am Andy departed with Mark and Mick in a chorus of good wishes for a two-hour bash through dense overgrown forest to the base of the climb.

As first light painted the cirrus clouds pink, I poured hot water into my frozen boots and threw on my pack. Dan’s mission was to hike to the summit via the Bushwalkers Route to abseil down the North West Face to capture footage. Simon and I were headed towards the eastern ridge where we could film the Blade.

Micro-spikes aided our scramble up. I set up my tripod and peered down into the amphitheatre. Three razor-sharp steps rose from an abyss of spiralling mist. Brilliant warm light filtered through the chilled heavy air, illuminating the Blade’s three sheer flaked ridges that led up to the massif of Federation Peak, where the North West Face reared up, waiting for Mark and Mick.

We estimated it would take a couple of hours for the climbers to reach the top of the first ridge. The hours ticked past and my eyes stung from the wind blasting up the gully. I thought of Dan dangling uncomfortably in his harness on the North West Face. Finally, just as I was warming a camera battery against my skin, Mick flopped onto the first step at a very delayed 1pm. Loose blocks, questionable anchor points and prickly scoparia bushes had slowed his and Mark’s ascent.

Simon and I captured the action as, for three long hours, Mark and Mick swung leads up. They arrived at the top of Blade Ridge cold, dehydrated and fatigued. It had taken them longer than expected to get to the North West Face and in fading light they weighed up the risks of continuing to climb into the night with dropping temperatures. A few days earlier Mick had declared he’d “never seen rock so wet that I’ve still wanted to climb so much”. As night fell, they made the decision to carry on.

One by one stars came out to join the two minuscule headlamps that had begun to scale the ominous black wall – Mark’s chance to make up for his previous failed attempt. They made good time, until dancing shadows revealed Mick struggling close to the top.

Dan, hanging above him, filmed as Mick jammed his bloodied hands into the cracks of the 45-degree angled roof – the hardest part of the climb. Suddenly a tiny beam of light hurtled down the face. It came to an abrupt stop, a crazed wail reverberated up the wall and we knew one of them had slipped. “I really didn’t think the gear would hold,” Mick later admitted.

FIETEEN LONG hours after their day began, Mark and Mick reached the summit under a crescent moon. It then took another two hours for them to abseil down the gully. We’d achieved – although only just – both our objectives: to complete and film a first winter ascent. Unbeknown to most of the team, the drone that was giving a bird’s-eye view to our film had almost plummeted into the gully, twice, after discharging its own propellers.

Back at camp, reunited, we sat in stunned silence, passing around a beaten-up plastic bottle of celebratory Glenfiddich, as Mick rocked in agony holding his feet. The evening was eerily still, even though an Antarctic weather system was blasting our way.

Our near future involved dry clothes, fresh oranges and fried eggs, but these luxuries seemed of little consequence. A strange feeling of emptiness fell on the group – an anticlimax. Clearly the journey we’d shared was of greater value than completing the climb and the film.

Andy sighed and leant back to take in the sky. In a quiet understatement he observed, “Wilderness evokes something in the human spirit that is really difficult to define.”

◀ **LEARN** more about the expedition at www.winterontheblade.com. A film will be released in late 2017.

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One of James Dorey's
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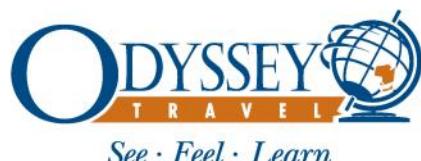
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An evening with underwater photography master Darren Jew

Thursday 18 May 2017

Reef Theatre, SEA LIFE Sydney Aquarium

JOIN US at this special AUSTRALIAN GEOGRAPHIC reader event in partnership with Coral Expeditions. You'll meet Canon ambassador Darren Jew, one of the stars of the hugely successful *Tales By Light* television series. Hear how he photographed a dozen male humpback whales chasing a single female during a Tongan 'heat run'. And find out what it was like swimming with groups of playful sea lions off Australia's southern coastline on assignment for AUSTRALIAN GEOGRAPHIC. Ticket price includes access from 6pm to SEA LIFE Sydney Aquarium for one hour before the talk begins at 7pm. Wine and canapés will be served after the presentation, which will take place in the unique aquatic-themed surrounds of the Reef Theatre. Book early because tickets are limited for what will be a very popular event. For more information and tickets visit: www.australiangeographic.com.au/society/events

Listen

Spirit of the Wild

10 July and 11 July

Melbourne Recital Centre, Southbank, Vic

NIGEL WESTLAKE'S new oboe concerto *Spirit of the Wild* (see page 18) – inspired by a visit to remote Bathurst Harbour in Tasmania – will be performed by the Australian Youth Orchestra, conducted by Nigel himself and featuring virtuoso oboist Diana Doherty. For more information and tickets visit www.melbournerecital.com.au/events/2017/lior-and-the-australian-youth-orchestra

Visit



Dark Mofo

8–21 June, Hobart, TAS

DARK MOFO is a weird and wonderful celebration of the winter solstice, masterminded by the folks at MONA (Museum of Old and New Art) in Hobart. Over two weeks, public art, music, films and delicious food enchant some 270,000 festival-goers. The closing ceremony features a cacophony of banging pots and pans and the cremation of an *ogoh-ogoh* (Balinese demon sculpture). Now in its fifth year, Dark Mofo is a quirky feast for the senses, and includes both family-friendly and free offerings. For more information visit: www.darkmofo.net.au or call 03 6277 9900.

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Mangrove Watch Ltd, \$13.99

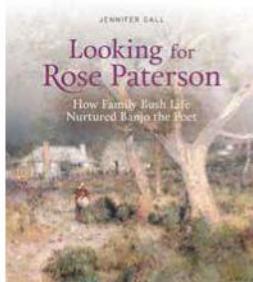
MANGROVE ECOSYSTEMS protect our coastlines from storms, floods and erosion. If you want to get to know these botanical heroes better, download this guide compiled by mangrove expert Dr Norman C. Duke. This detailed app provides images and information so you can identify and learn about these incredible trees. You can also contribute your own photos and sightings to help scientists better understand Australia's mangrove species.



Read

Looking for Rose Paterson: How Family Bush Life Nurtured Banjo the Poet

Jennifer Gall, NLA Publishing, \$44.99

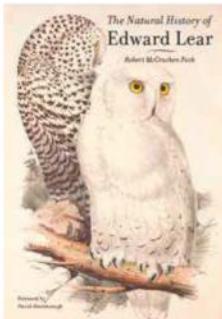


ROSE PATERSON was the mother of revered Aussie bush poet Banjo Paterson. This book uncovers the struggles of a resilient, educated rural housewife. Often left to care for her seven children in a run-down house on a remote pastoral station, Rose's surviving letters bring 19th-century rural Australia into focus. Her story provides a glimpse into Banjo's early life and the environment that shaped his writing.

The Natural History of Edward Lear

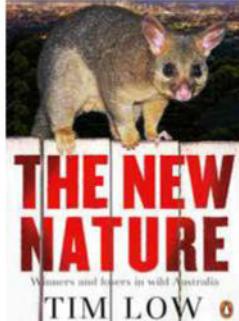
Robert McCracken Peck, ACC Art Books, \$54.99

FAMED AUTHOR of *The Owl and the Pussycat* Edward Lear is best remembered for nonsense writing and limericks. But before his career with words, Lear was an accomplished natural-history illustrator. This beautiful book explores his foray into scientific publishing, beginning with his spectacular parrot work aged just 18. Author and scholar Robert McCracken Peck assembles more than 20 years of research to illuminate Lear's superb artistry and lasting influence on natural-history illustration.



The New Nature: Winners and Losers in Wild Australia

Tim Low, Penguin Books, \$22.99



FIRST PUBLISHED 15 years ago the award-winning book *The New Nature* remains compelling and relevant today. This thought-provoking, rigorously researched book examines the relationship between humans and nature, challenges our conceptions of wilderness, and reveals stories of fascinating species hiding in plain sight in our cities and backyards. Low has revised and updated this edition to reflect developments in his case studies and stories.



Visit

Lustre: Pearling and Australia

Until 13 August, Australian National Maritime Museum, Sydney, NSW

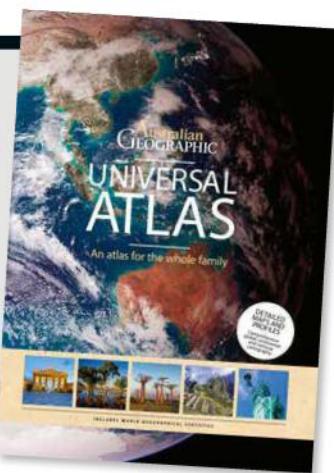


DISCOVER AUSTRALIA'S fascinating pearling heritage, from the birth of pearling in Australia 22,000 years ago to today's modern pearl farms. This exhibition illuminates the raw, fascinating stories of the people behind pearls, drawing on Aboriginal, Asian and European experiences. See a 2000-year-old natural pearl discovered in a rock-shelter in the Kimberley, and marvel at lavish jewellery. For more information visit: www.anmm.gov.au or call 02 9298 3777.

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CSIRO entomologist Bryan 'The Fly Guy' Lessard catches insects on the last rope on the climb up Mt Lidgbird to Goat House Cave.



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SOCIETY UPCOMING EXPEDITION

Lord Howe under the microscope

New friends and discoveries abounded on the first Australian Geographic Society Lord Howe Island scientific expedition. Find out how you can join us again this year.

STORY AND IMAGES BY LUKE HANSON



Guests enjoy a sunset drink at the Pinetrees Lodge boatshed after a long day of walking and snorkelling. Pinetrees guests have been relaxing at this spot for more than a century.



► **Bryan Lessard** inspects his new species of soldier fly. He will also get to name it: his previous discovery was named *Plinthina beyonceae* after the pop star Beyoncé.



► **Citizen scientists** tread warily over a rocky route to the Herring Pools on the remote north coast of Lord Howe Island. Timing is critical because waves wash through this ledge at high tide.



Some of the expedition's citizen scientists take a break to watch red-tailed tropicbirds ride the thermals around Mt Lidgbird.



Lord Howe
Island

THE INAUGURAL Australian Geographic Society Expedition to Lord Howe set out last year to explore the island's insect diversity. Run in partnership with Pinetrees Lodge and the Lord Howe Island Board (LHIB), it was a five-day experience hosted by Society chair Jo Runciman and led by entomologists Andreas Zwick and Bryan 'The Fly Guy' Lessard, both from CSIRO's Australian National Insect Collection (ANIC) in Canberra. They were joined by 20 AUSTRALIAN GEOGRAPHIC readers turned citizen scientists, all keen to help identify, describe and classify insects.

Andreas runs the ANIC's molecular laboratory and much of his research involves mapping and sequencing insect genomes to better understand evolutionary processes. Every insect that passes his molecular scrutiny stands to contribute something to humanity: perhaps a cure for cancer or the source of a pest-resistant crop. Regardless of the eventual outcomes of *this* field trip, it gave both scientists the opportunity to get out of the lab and hang with an enthusiastic bunch of helpers in a setting that's as close to paradise as you'll find anywhere on earth.

Our volunteers were a mixed bunch from all over Australia. There was a sculptor, army captain, pharmacist, writer, statistician, publisher, retired zoologist, ecologist and several high-school science teachers. Two were champions in the competitive orienteering sport of rogaining, which came in particularly handy in remote parts of the island.

Our first day involved a 5km reconnaissance walk from Soldiers Creek to Mutton Bird Point through distinct forest types. The scientists were keen to find good locations for day and night-time trapping. We were met en route by ex-ranger and ecologist Dean Hiscox, who explained Lord Howe's volcanic origins and six-million-year geological history. Dean led the famed 2001 climb of Balls Pyramid, 24km south-east of the island (see AG 88), which rediscovered the Lord Howe Island phasmid (*Dryococelus australis*), so his presence on the team was invaluable. After lunch, we took the opportunity to explore exposed rock pools and coral reefs at Middle Beach and were thrilled to see sooty tern chicks just hours after hatching.

In the evening, we helped Andreas and his volunteer assistant from CSIRO, Glenn Cocking, set up moth-trapping stations in Stevens Reserve and later collected moth species under bright UV lights. We caught more than 50 different species, some multi-coloured, some translucent and others looking as if they'd been draped in gold leaf. ▶



After a 200m near-vertical climb from Old Settlement Beach, guests catch insects in yet another forest type on the ridge near Kims Lookout.

ON DAY TWO the group split, with some guests working in the lab with Andreas to classify, sort and preserve newly collected specimens to be sent to Canberra. Others, brandishing insect nets, climbed the 777m Mt Lidgbird to Goat House Cave. Along the way, 'Fly Guy' Bryan established a series of tent-like Malaise traps to capture passing insects and, after a short detour due to a wrong turn, he announced he'd located a previously undescribed soldier fly species he'd been hoping to find. He couldn't keep the grin off his face for the rest of the day!

In the afternoon, we ventured through an ancient Jurassic Park-like forest of banyan trees and kentia palms to Little Island – beneath Mt Lidgbird's dramatic cliffs – and explored coastal boulders and the intertidal zone.

The next day, Wednesday, brought clear skies and a light sea breeze, so we boarded a local glass-bottom boat and headed to North Bay for a seabird survey with Darcie Bellanto, an LHIB ranger. The sooty tern colony on North Bay's beach has been growing in recent years, and, without adequate funds or field staff to conduct a full survey, there was only a rough estimate of the number of breeding pairs. The board designed a survey for our citizen scientists and we counted an average of 90 nests in each 45m survey plot: a lot of birds!

Later we snorkelled on the wreck of the MV *Favourite* and walked around the rocks from the Old Gulch to the Herring Pools – a series of coral-lined rock pools nestled among red basalt dykes. Some of us began swimming, jumping, slipping and having fun the way kids usually do splashing around in rock pools. Others stood, seemingly



▲ Setting up a Malaise trap in the kentia palm forest below Smoking Tree Ridge. Expeditioners returned three days later to gather trapped insects that had been preserved in ethanol.

mesmerised, with binoculars trained on the thousands of sooty terns, red-tailed tropicbirds and brown noddies on the Malabar cliffs high above. The final activity on this exhausting day was a cruise with Lord Howe's turtle whisperer, Pete Busteed, to find green and hawksbill turtles in the North Passage. Pete found eight large turtles, but with all the excitement and twists and turns of the boat, it could have been the same turtle eight times, although we were assured that probably six of them were previously unknown.



▲ Inspecting our moth collection after five days of sampling. This collection is available for viewing at CSIRO's Australian National Insect Collection in Canberra.

They were some of the biggest I've ever seen in the Lord Howe Lagoon, and triggered many comments from our group along the lines of "wow" and "best day ever!"

On Thursday, some people were needed for lab work back at Pinetrees Lodge while a smaller group – assisted by fit young hotel staff – carried generators, fuel, lights, traps, camping equipment and provisions over to Rocky Run for Andreas and Glenn to continue their moth survey in the melaleuca forest.

AFTER DAYS of insect sampling, our final contribution to Lord Howe conservation was in the lagoon with Dean Hiscox. During the past decade, Dean has been surveying Lord Howe's population of McCulloch's clownfish as an indicator of reef health. Most of our guests donned wetsuits, masks, snorkels and flippers and counted these clownfish across several reefs. It's not as easy as it might seem because they all look the same and swim around a lot. Our results reflected the tricky conditions, with counts on some bommies ranging from eight to 45. Luckily, the final figure for each reef was consistent with previous surveys: good news indeed because it indicates the reef here continues to be one of the most pristine in the world. Being 600km from the Australian mainland, and outside of the vast coral bleaching zone in the Coral Sea, certainly helps.

Our last day was all about consolidation. Some guests went with Bryan to collect his Malaise traps, others stayed with Andreas and his microscope, while still others sneaked away for some walking, kayaking and golf. Late in the day, we met on the Pinetrees verandah and were stunned to see the size and beauty of the moth collection we had accumulated from five days of sampling: Andreas estimated we had about 150 species. Bryan confirmed he'd found two new species of soldier fly – the second one was located in Pinetrees' organic garden. Imagine his smile!

Thanks to Hank Bower and Penny Holloway at the Lord Howe Island Board for designing and approving the research proposal, and for understanding the importance of citizen science. AG

An advertisement for the second Australian Geographic Society Lord Howe Island Scientific Expedition. At the top is a circular logo for the "AUSTRALIAN GEOGRAPHIC SOCIETY" with a compass rose design. Below the logo is a photograph of a group of people gathered under a white umbrella on a grassy cliff overlooking the ocean at sunset. The text "Calling all budding citizen scientists!" is prominently displayed in large, bold letters. Below that, in a yellow box, is the text "Join us for the second Australian Geographic Society Lord Howe Island Scientific Expedition".

Join Jo Runciman, chair of the AGS, research scientists from CSIRO and members of the Lord Howe Island Board for our second Lord Howe expedition. If you have a thirst for knowledge, a passion for nature and conservation and a good level of fitness (i.e. can walk 5km in 1.5 hours and are sure-footed in steep mountain terrain), you can help discover potential new insect species on this island paradise. You don't need any scientific training! Many species remain scientifically undescribed or unrecorded since 1978, so the expedition stands to make a significant contribution to conservation. After each memorable day, you'll return to Pinetrees Lodge for a hot shower, sunset drink, exceptional four-course dinner, great wine and comfortable bed. You'll experience the perfect balance between physical exercise, mental stimulation, social interaction and some of life's more enjoyable treats. Plus, there's no mobile phone coverage on Lord Howe!

DATES: 15–22 October 2017

COST: From \$4250pp, twin share

INCLUSIONS: Return airfares from Sydney; local transfers; seven nights accommodation plus breakfasts, lunches and dinners at Pinetrees Lodge; sunset drinks and afternoon teas; bushwalking.

ACTIVITIES: Six days of invertebrate field research with breaks for seabird and coral surveys; hands-on training from CSIRO scientists.

BOOKINGS: Call Pinetrees Lodge on 02 9262 6585 or email info@pinetrees.com.au

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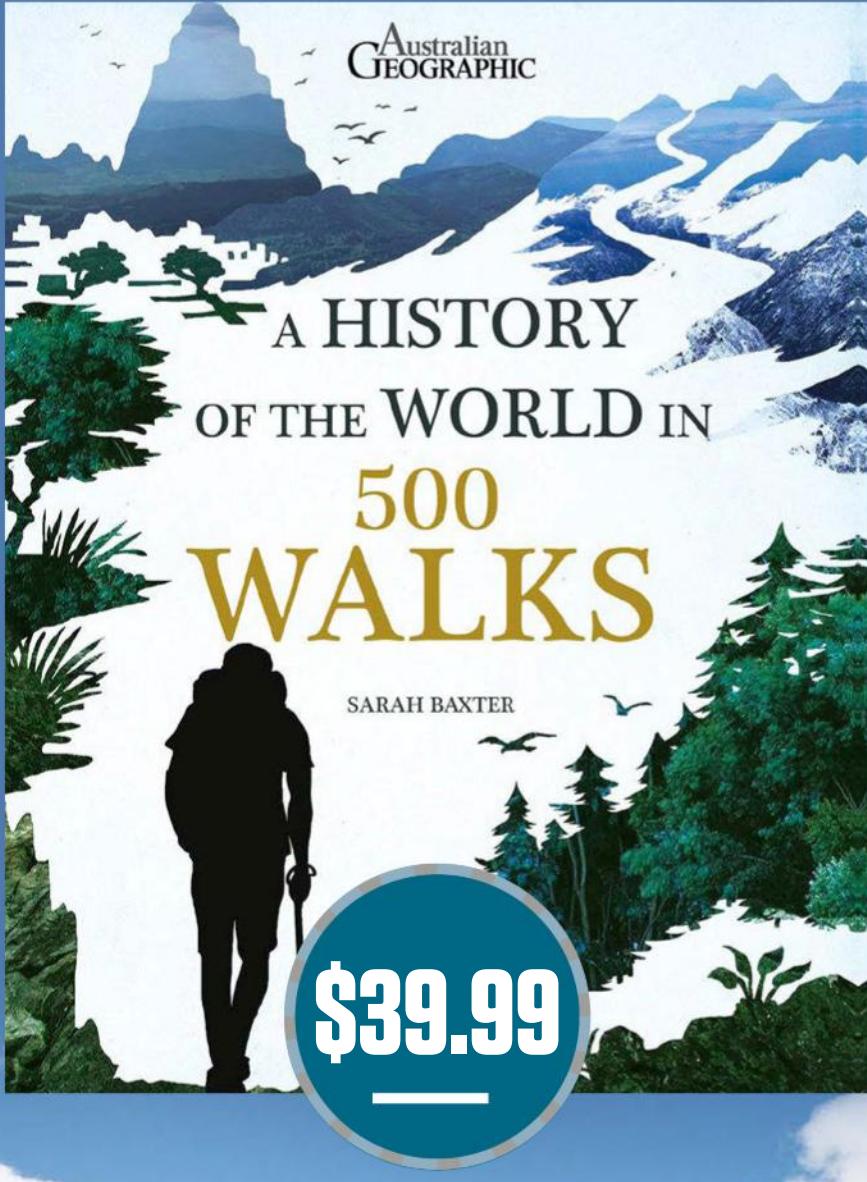


A Portrait of Australia

Since its launch in 1986, Australian Geographic has sought to understand, interpret and celebrate the wild and ancient land we call home through the filter of its people. In this special anniversary coffee table book, we have collected together extracts from 60 of the top stories from the past three decades of the Australian Geographic journal.



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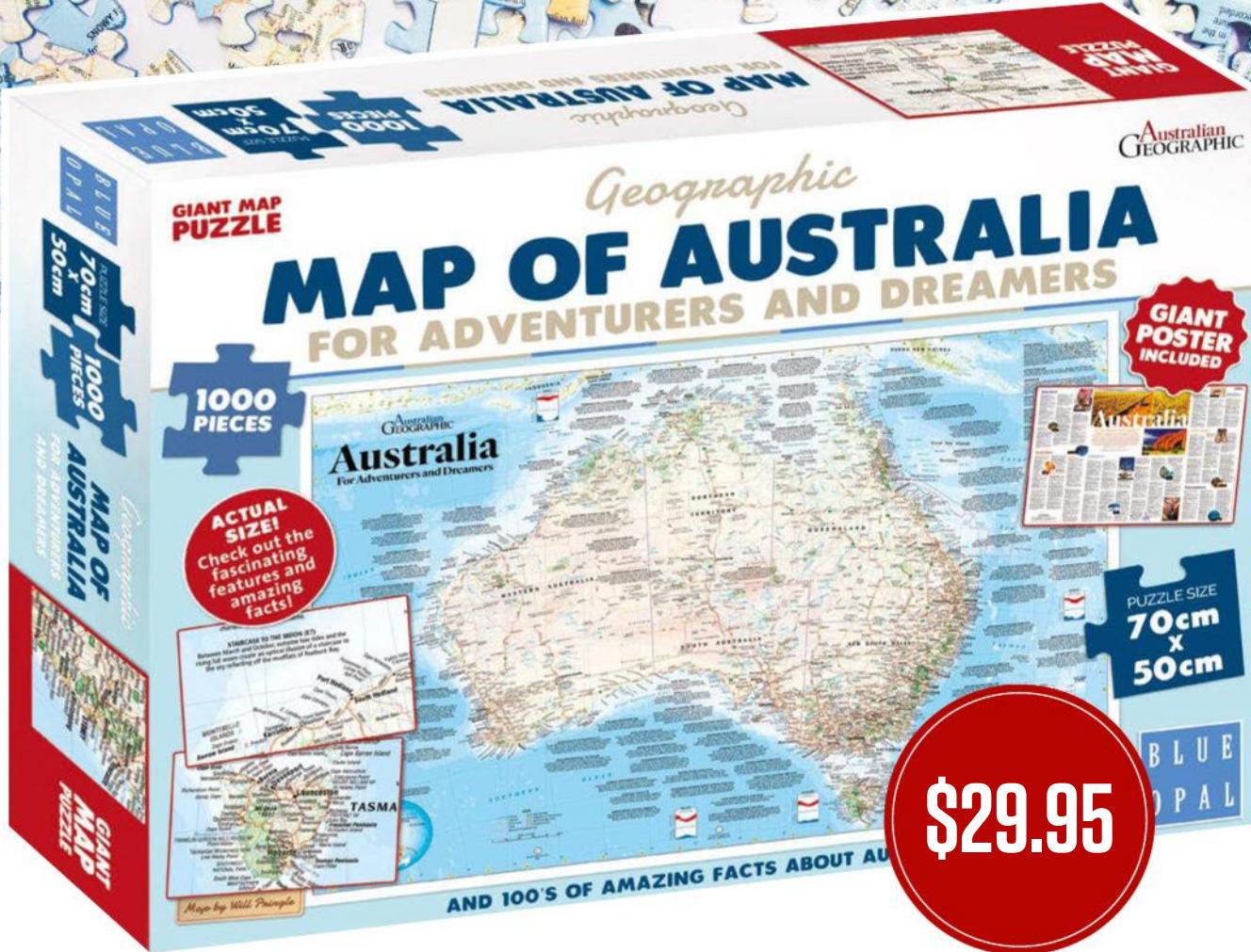


A History of the World in 500 Walks

is a treasure trove for anyone keen to learn more about the global landscape and its legacy. Through inspirational commentary, illustrated maps and stunning photography, it explores 500 historically resonant trails – both man-made and natural – showing how the world came to be, and telling the beginning of the human story. Whether you're a seasoned hiker or an armchair historian, the breadth of historical and cultural coverage in this book will take you on a journey through time and place – and might even lead you to set off on a walk of your own.

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LAT LONG: 12° 26'S 130° 49'E

The Darwin Lions Beer Can Regatta

Darwin captured international attention 44 years ago with the world's first regatta for boats made from beer cans. Today, the Top End tradition still draws an eclectic seafaring fleet and would-be naval architects, all keen to claim line honours.

STORY AND PHOTOGRAPHY BY PETA BURTON

TINNINDEX, LASER, *Big Smoke Bottle Boat*, *Good Glitter*, *Black Pearl* and *Duke's Mob* are ready to race and thousands will see them do battle at Mindil Beach.

It's the 2016 Darwin Lions Beer Can Regatta and competitors are set to paddle self-built, aluminium-can-clad craft around a one nautical mile course in Darwin Harbour. While thong-throwing, tug-of-war and sandcastle competitions occupy the audience, the regatta's dedicated crews make minor adjustments to their unorthodox vessels – as well as to their outfits and plans to win the coveted Beer Can Cup.

Since the regatta began in 1974, its gold-coin entry fee has raised more than \$1.47 million for Northern Territory causes. Worthy projects supported by the funds range from a new ambulance to the non-profit Riding for the Disabled. The regatta is a feel-good event buoyant with fun, camaraderie and clever creations.

One local known for his beer-can constructions is Mick Keeley, who has previously won the Superboats Class for his vessels *Gragmonsta* and *Extravacanz*. "Both carried 80-plus people but *Extravacanz* was a 30,000-can, two-storey catamaran and even had a water cannon," the non-beer drinking fitter and turner informs me.

Darwin marine technician Paul Rich started with a tri-hull, kayaks and boogie-board boat before building *Coke-A-Dile*, which claimed a best Soft Drink Boat honour. Then he created *Pure Blonde Croc*. "They were beauties, but, for me, it's about involving my kids and seeing families and school kids take part in this iconic event," he says.

Winning is the drawcard for other competitors. "We've driven our [5000] plastic wine-bottle craft, *Big Smoke Bottle Boat*, [almost 5000km] from Sydney to take the trophy off the Territorians," says Alan Jones.

Although enthusiasm and commitment help with finishing first, success also requires mathematics and engineering knowledge, ingenuity and even heroism.

A vibrant bunch of determined millennials makes a strong start on board their soft-drink-can craft, *Duke's Mob*, during the regatta's main race.



The first Darwin Beer Can Regatta poster, from 1974 (above). Thong-throwing (right) needs focus when you're only this high surrounded by a crowd of 16,000.

At 3pm, the starter horn blasts and a flurry of aluminium exits the foreshore to begin the race. Lutz Frankenfeld, aged 74 and the founder and former chairman of the regatta, watches on.

"This event has come a long way," he says. "In 1973 Swan Brewery approached Paul Rice-Chapman from *NT News* about staging a sports event in Darwin. He then sought my input and six months later I'd built the world's first beer-can boat prototype. *Dry Ark* was made of 780 cans with 25 horsepower on the back. I set up ▶



An original image of Darwin's first trade mission to Singapore on Can-tiki. The trio on board achieved 315 nautical miles on their best day. Can-tiki also earned an official Seaworthiness Certificate 1.



An anchor made from cans: such ingenuity among would-be navigational architects has been running strong for decades.



The 2016 winner, Laser, with its crew ready to celebrate, no doubt with a few full cans! Beer-can boatbuilding comes in all shapes, sizes and brews (left).



An original image of *Can-tiki*, built by Lutz Frankenfeld. It won the 1980 regatta on a 200hp Evinrude motor.

a course to see what it could do and reached six knots. So we upgraded to 40 horsepower and she flew.”

On 16 June 1974 – six months before Cyclone Tracy devastated Darwin – 22,000 people lined Vestey's Beach to watch 60-plus steel-can boats, some with outboards, race in the first Darwin World Cup Beer Can Regatta.

“It was and still is such an original event,” Lutz says. “People picked up cans littered across Darwin, which ignited the first Keep Australia Beautiful campaign, so we cleaned up the city, turned a by-product into boats, created a carnival-atmosphere festival and captured Australia and the world’s imagination.”

NT News promotions and postcards of regatta masterpieces helped spread the word. So too did a fancy-dress ball and Lutz’s interstate lectures on beer-can boat-building. He even included details about constructing a Viking ship commissioned by the Australian National Maritime Museum in Sydney. Beer-can boats made world headlines but the real buzz was about to unfold.

“Clem Jones, who was the post-Tracy reconstruction chairman appointed by [former prime minister] Gough Whitlam, asked if I could build a beer-can boat that could travel from Darwin to Singapore,” Lutz remembers. “So I did, and on 3 September 1977 *Can-tiki* set sail with Clem as captain, me as builder-mechanic and Paul Harding navigating by compass and the stars. International media followed our 12-day voyage, which became one of the greatest PR exercises Australia had ever undertaken.”

Lutz says it highlighted Darwin’s close proximity to overseas trading partners and showcased the rebuilt city as being open for business.

Committed to the *Can-tiki* project, Back To Darwin festival and Darwin Rebirth, Lutz invited Darwin’s Lions

Clubs to take over the regatta in 1978, when it was moved to Mindil Beach. The other major change came in the mid-’80s when steel cans were replaced by the aluminium variety, which crush at high speeds, leading to the abolition of the powered boat category.

“We’ve seen some extraordinary sights over the years and ‘thou shalt compete and have a bloody good time’ has always been one of our 10 CanMandments,” says William ‘Spud’ Murphy, Lions regatta commentator.

Other CanMandments, he says, include: “Thou shalt build thy craft of cans”, which must be drink cans, open, emptied and in more or less original state. Any attempts to enter a submarine [a craft made of full cans] will result in confiscation and disposal by the Committee.”

“Thy craft shall float by cans alone” is another CanMandment,” says William, explaining that cans must provide at least 51 per cent of a craft’s flotation. They can be stuck together with anything as long as this rule isn’t broken. The outer hull must also be made of cans, two-thirds of which have to be uncovered and visible.

The finish of the 2016 race is imminent, and William returns to his mic, yelling, “Crikey, folks, *Laser* has just taken the lead and look at it speed home!” The Mindil foreshore erupts.

The ecstatic crew from the 2000-beer-can craft launch themselves onto the sand and the boat’s builder, Jeff Ottway, is beaming. “She just flies,” he says. The electrical store worker and his team of co-workers spent 30-plus hours constructing the 3m speedster. “It comes down to design and the correct weight ratio, which is two cans per pound for flotation. She weighs more now though ‘cos we took on water,” Jeff says. “But we’re darn proud to win and the trophy’s going on the front counter at work.” Once more the Territorians have held fast to those esteemed beer-can bragging rights.

AUSTRALIAN GEOGRAPHIC thanks Lutz Frankenfeld and the Lions Club of Darwin for their assistance.

BEARINGS: MINDIL BEACH, DARWIN

Formerly named: Darwin World Cup Beer Can Regatta

Record holder: Darwin’s Dean Wakley won five times straight, lost, then won the cup back

Fundraising tally since 1974: \$1,470,000

2016 event raised: \$49,000

Fee: Gold-coin donation

Next regatta: Sunday 9 July 2017

More information: www.beercanregatta.org.au

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AG READER EVENT

Hosted by **Chrissie Goldrick**
Editor-in-chief
AUSTRALIAN GEOGRAPHIC



JADE HAMEISTER

HEAR HOW MELBOURNE schoolgirl Jade Hameister walked into the history books in 2016 when she became the youngest person to trek one of the more difficult routes to the North Pole at the age of 14. She faced dangerous conditions, freezing temperatures and the threat of polar bears. In May she will ski 540km from coast to coast across Greenland – the world's second biggest ice cap. Jade is living proof that age is no barrier to achieving your dreams, no matter how big those dreams may be.



SANDY ROBSON

MEET SEA KAYAKER Sandy Robson and hear about her five-year, 22,000km solo kayak journey from Germany to Australia through 20 countries, completed in November 2016. She was inspired by German canoeist Oskar Speck who, between 1932 and 1939, paddled a folding kayak along the same route. Sandy retraced his steps in the hope that her journey would inspire women adventurers and to highlight the importance of taking care of our oceans. Come along and hear the story of her epic journey.



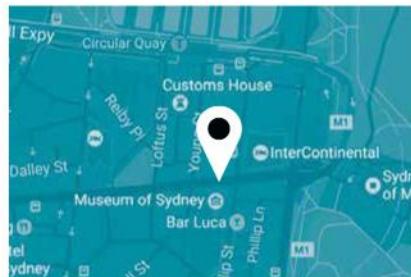
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Come and join us for an evening of courage and inspiration with three of Australia's most outstanding women adventurers.



CAROLINE PEMBERTON, presenter of the AG Adventures TV series and the AG Explores documentary series, celebrates the spirit of adventure with special guests Jade Hameister and Sandy Robson. Hear their inspiring stories of dedication and tenacity in the face of huge odds.

- Thursday 31 August 2017 at 6.30pm for a 7pm sit-down in the theatre.



- Museum of Sydney, corner of Phillip and Bridge streets, Sydney.
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Your Society

Australian Geographic Society news & initiatives



AGS 2016 Young Adventurer of the Year Jade Hameister (right) with Sue Badyari, CEO of World Expeditions, sponsor of the award.

Recognising achievement



IT'S THAT TIME when we invite you to nominate your candidates for our annual adventure and conservation awards. Each year at our grand awards ceremony – which will this year be held in Sydney on 1 November (see page 119) – we honour outstanding accomplishments by inspiring Australians. We are always keen to hear about your heroes and encourage you to send in your nominations. You can do this via the AG Society

pages on our website www.australiangeographic.com.au/society, where you can download a nomination form. The deadline is 30 June, so don't delay.

Last year's amazing Young Adventurer of the Year was Jade Hameister, who in 2016 skied to the North Pole at the age of 14 and, as we go to press, is attempting to traverse the Greenland Icecap on skis. After she returns, she'll be speaking at a special AG Society event at the Museum of Sydney on 31 August (see page 116) celebrating the outstanding achievements of Australian women adventurers. Jade is an extraordinary young woman and role model. Also on the bill that night will be Sandy Robson, who in November completed an epic three-year kayaking journey from Germany to Australia. Sandy and Jade, together with our fearless AG TV presenter Caroline Pemberton, will be celebrating Aussie women adventurers. Hope you can join us there.

Jo Runciman, AGS chair

Your subscription is essential to the work of the **Australian Geographic Society**

EVERY SUBSCRIBER to this journal automatically becomes a member of the not-for-profit AG Society. Your subscription helps us fund the work of Australia's scientists, conservationists, adventurers and explorers. The Society also raises money through six annual fundraisers in AG retail stores and is supported via your direct donations.

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Who are the Australian Geographic Society?

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Advisory Council: Jo Runciman (chair), Chrissie Goldrick, Adrian Goss, John Leece OAM, Tim Jarvis AM, Anna Rose, Todd Tai

Society administrator: Rebecca Cotton

THE SOCIETY runs two sponsorship rounds per year – in April and November – during which its specialised adventure, science and community committees consider applications and disperse grants. These grants are directly funded through the Australian Geographic business.

The Society also awards the Nancy Bird Walton sponsorship for young female adventurers and hosts annual awards for excellence and achievement in conservation and adventure. It runs six wildlife fundraisers per year through AG retail stores and the AUSTRALIAN GEOGRAPHIC journal's multiple platforms. Each year the Society gives in excess of \$300,000 to Australian conservation and adventure.

Field notes

We're catching up with some of our sponsorship recipients so you can see how your contributions are helping to conserve our natural history and keep alive the Aussie spirit of adventure.

CONGRATULATIONS TO **Liam Suckling**, who has completed the first phase of his 1SKY.earth expedition. In January Liam reached the summit of Mt Vinson, Antarctica's highest point, then completed a 200km ski traverse to Union Glacier. Liam has now departed for the expedition's second phase: an overland motorcycle circumnavigation of the earth. The final stage will be a five-month trek on foot from India's Bay of Bengal to Mt Everest's summit. Find out more at www.1SKYearth



Ana Gracanin.

Southern Cross University researchers are teaming up with Cape Byron Marine Park to support local young people plan and conduct a campaign to reduce beach litter left by visitors during schoolies week in Byron Bay. Professor **Amy Cutter-Mackenzie** is leading the recruitment of local youth volunteers, who will create and run programs to reduce the environmental impact of the holiday period.

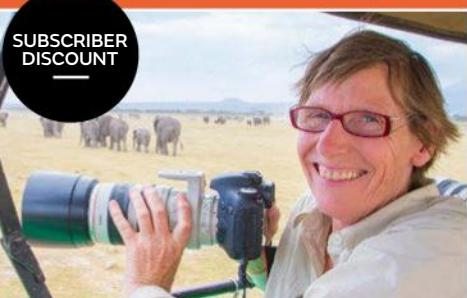
Ana Gracanin has literally taken to the trees for a unique AGS-supported survey of marsupials in canopies. Ana's project involves climbing dozens of eucalypts in Budderoo National Park and spending days and nights in the canopy. Using 20 cameras, she will collect photo and video footage of arboreal life, and then analyse it for details on abundance, distribution, community assemblage and behaviour. Ana hopes to record the elusive and cryptic greater glider.



Amy Cutter-Mackenzie.

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WANT TO GET INVOLVED?

THE BEST WAY to support the Society is by subscribing to this journal (see page 52) and purchasing our products sold through Magshop and the Australian Geographic retail stores. Participating in our scientific and travel-partner trips is also a great way to enjoy unique experiences while helping to raise funds for the Society.

CONTACT AGS administrator **Rebecca Cotton** at society@ausgeo.com.au or visit www.australiangeographic.com.au/society

Discover Australia

Your Society
May · June 2017



The AG Society's expedition program and those of its selected travel partners provide informative, inspiring and unique experiences for readers. Your participation in these adventures supports the Society's mission to foster the spirit of discovery and adventure and contributes funds to our work.

AG SOCIETY SCIENTIFIC AND CULTURAL EXPEDITIONS

LIGHTNING RIDGE FOSSIL DIG

● THE AGS offers you a chance to hunt for fossils on the opal fields. Join us in this endeavour and pitch in with the fieldwork. Guided by experts, you will go to special locations, seeking new specimens for the collections of the Australian Opal Centre.

Your discoveries will further establish this museum collection as a world-class scientific and cultural resource. The week will also feature a series of lectures on opals and gems, mining history, opalised fossils, dinosaur hunting and new dinosaurs.



WHEN: 7–12 and 14–19 August 2017

COST: \$2200pp. Includes all activities and many lunches and dinners.

BOOKINGS: Call 0467 974 018 or email dig@australianopalcentre.com

LORD HOWE ISLAND SCIENTIFIC EXPEDITION

● COME WITH the Society to the South Pacific to survey biodiversity. Run in partnership with Pinetrees Lodge and the Lord Howe Island Board, this scientific expedition is a unique opportunity for 20 readers to enjoy bushwalks and nature experiences while helping CSIRO scientists to survey endemic snails,

beetles and other insects that are thought to be close to extinction. Many species on the island remain undescribed or unrecorded, so the expedition stands to make a significant contribution to conservation. Opportunities for coral and bird surveys will be available and evening lectures will be provided.



DATES: 15–22 October 2017

COST: From \$4250pp

INCLUSIONS: Return airfares from Sydney; local transfers; seven nights accommodation and meals at Pinetrees Lodge; sunset drinks and afternoon teas; bushwalking activities

BOOKINGS: Call Pinetrees on 02 9262 6585 or email info@pinetrees.com.au

TRAVEL PARTNER EXPEDITIONS

DINOSAURS OF ARGENTINA

● A SMALL group tour led by former editor of AUSTRALIAN GEOGRAPHIC John Pickrell to a series of important dinosaur sites and museums. This trip includes three days of fossil-dig activity and a visit to a brand-new titanosaur (possibly the largest dinosaur ever discovered) at

Trelew in Patagonia. This 17-day adventure gives you the chance to meet some of the top guides to and experts on Argentina's palaeontological treasures. You will visit key sites and dig at the Lago Barreales Paleontology Center (Proyecto Dino).



WHO: Odyssey Travel

DATES: 19 September–5 October 2017 (17 days)

COST: From \$9995pp (twin share)

BOOKINGS: Call Odyssey on 1300 888 225, email info@odysseytravel.com.au or visit www.odysseytraveller.com.au



KIMBERLEY COAST – WITH MIKE CUSACK

● 2017 MARKS THE 30th anniversary of AUSTRALIAN GEOGRAPHIC's first 'Wilderness Couple'. To celebrate, Mike Cusack will lead four Aurora Kimberley Coast expeditions. In 1987 Dick Smith chose Mike and his wife, Susan, to spend 12 months living off the land in the Kimberley, and Mike will share his knowledge and adventurous spirit on these trips. *Coral Expeditions I* will lead you to the waters of the Indian Ocean, where you will enter one of our most exotic regions. Using Zodiacs, you'll also visit sites accessible only by sea.



GREAT BARRIER REEF CRUISE

● Join AG Society host Cornelia Schulze on an exciting expedition to discover the history of Cooktown and the natural beauty of remote Lizard Island, as well as the wonders of the Great Barrier Reef – both above and below the surface. Living in style for eight days aboard *Coral Expeditions II*, you'll explore the lesser known ribbon reef systems of the GBR's north-east, which are not easily reached by day boats. See page 68 for more information.

WHO: Aurora Expeditions **DATES:** Darwin to Broome: 2–12 June or 23 June–3 July **Broome to Darwin:** 12–22 June or 3–13 July **COST:** From \$7990pp **BOOKINGS:** Call 1800 637 688 or visit www.auroraexpeditions.com.au

WHO: Coral Expeditions **DATES:** 30 October–6 November **COST:** From \$3395pp **BOOKINGS:** Call 1800 079 545, email cruise@coralexpeditions.com or visit www.coralexpeditions.com

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WHO: Aurora Expeditions
DATES: 18–26 September 2017
COST: \$7100pp
BOOKINGS: www.auroraexpeditions.com.au or call 1300 076 131

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WHO: Outback Spirit
DATES: Sep-Dec 2017
COST: From \$6545pp (twin share)
BOOKINGS: Call 1800 OUTBACK (1800 688 222) or visit www.outbackspirittours.com.au

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WHO: Coral Expeditions
DATES: May, June, October and November 2017
Great Barrier Reef cruise departures. Conditions apply.
COST: From \$1650pp (twin share)
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The rivers wild

54 **INTO THE WET**

ORPHANED LUMHOLTZ'S tree kangaroo Nelson took an instant shine to long-time AG photographer Don Fuchs, on assignment for us covering far north Queensland's Wet Tropics during the Wet. "Getting close to these elusive and irresistible rainforest animals ranks as the all-time favourite animal encounter in Australia," Don says. Nelson was being looked after by a wildlife carer who specialises in nursing orphaned or injured tree kangaroos back to strength before returning them to the rainforest. Travelling between Cairns and Cardwell during the Wet was a huge eye-opener for Don. "Water," he says, "is the defining element." It can be a headache when in oversupply or a pleasure when it provides refuge from the oppressive humidity. It creates the area's iconic waterfalls, swimming holes and wild river playgrounds for adventure seekers, rafters and canyoneers. And it nurtures the ancient rainforests, where rare creatures such as tree kangaroos still find a habitat.



Taken by the reef

68 **CORAL CRUSADES**

BY EXPLORING the Great Barrier Reef with Coral Expeditions, AG production editor Jess Teideman was able to tick off a long-time entry on her bucket list – snorkelling on the reef. On assignment she visited exclusive moorings specifically located to highlight the three main reef types visited by Coral Expeditions and ventured kilometres out to sea beyond the reach of day boats. "It was amazing to be standing on the deck of a boat and know that

on the other side of the ribbon reef is the wide open ocean – and behind you land is many hours out of reach," Jess says. "Snorkelling the reef this far from shore – remote and isolated – made the experience particularly special." Other highlights of the assignment included the historic village of Cooktown and climbing Lizard Island's highest point. But it is, Jess says, the wonders of the world beneath the waves that will remain most vivid in her memory.

**Answer to
Then and Now:**
Pictured on page 29 is Bath Street, viewed from Anzac Hill, in Alice Springs, NT. The images shown are from 1940 and 2015.

PARTING SHOT

Stop the quiet slide into oblivion

Even uncharismatic plants and reptiles, **TIM LOW** explains, are worthy of our love, attention and protection from extinction.



IN 2013 I SAW the last Christmas Island forest skink in captivity on the island, eight months before its death marked the loss of its species. What disturbs me about this is not only its extinction, but the lack of interest it aroused. There were few media reports to mark Australia losing one of its unique animals.

There was far more attention four years earlier when the Christmas Island pipistrelle, a bat, became extinct. And there were news reports in June 2016 when a rat, the Bramble Cay melomys, was declared extinct. Mammals are more newsworthy than lizards, it seems.

The lizard's extinction would surely have made the news had it occurred near a major city. The endangered striped legless lizard, found around Canberra and Melbourne, and grassland earless dragon, a resident of Canberra, sometimes feature in the media, unlike most rare reptiles. Importantly, and unlike most threatened reptiles, they attract significant conservation funding.

The forest skink would probably have made the news had its demise, like that of the melomys, been blamed on climate change, but the main culprit seems to have been the introduced Asian wolf snake. The lizard was far away and succumbed to a less newsworthy problem.

Vast numbers of plants and invertebrate species could follow quietly into oblivion. In April 2016 I attended a workshop about myrtle rust, the frightening South American pathogen killing Australian plants. Work is underway to save two species in dire straits – the angle-stemmed myrtle and Sunshine Coast myrtle, which grow near Brisbane and the Sunshine Coast.

The even rarer narrow-leaved malletwood – known from fewer than 30 wild trees in a central Queensland national park – is not being managed at all. A cultivated specimen died within two years of rust infection. Will the species be saved? It's poorly known with an unappealing name, living in a remote location. I fear for its future.

I do not fear for unassailably popular koalas. They're likened to teddy bears and biologists have suggested they tug at our heartstrings because they have the head-to-body ratio of a young child. They receive plenty of media interest and conservation funding.

Imagine if attractive people received privileged hospital treatment and special government grants. We'd reject that world as unfair, but that's how I see Australia's conservation approach. As a signatory to the UN's Convention on Biological Diversity, Australia is legally bound to protect all species.

All biodiversity has intrinsic value and species have ecological roles in the communities they inhabit.

All species should be saved, not just those we find appealing. Yet, in practice, mammals and birds get most funding. This suits many in government, who don't want to give all the funding required to save dwindling species.

Australians should think seriously about the distorting influence exerted by favouritism. Questions should be asked about why the feral cat problem receives so much funding while little is spent on myrtle rust, despite the fact

it threatens similar species numbers with extinction. Why is invertebrate conservation so often about butterflies and rarely about moths, spiders or grasshoppers, which, ecologically, can be more significant? The endangered golden sun moth is an exception that proves my point. It's a pretty day-flying moth that looks like a butterfly and is found around Melbourne and Canberra. So it gets attention, but for reasons that reinforce my concerns.

I want to live in a country where every species is valued and saved, not just those that tick certain boxes. I sometimes see heartening signs that conservation efforts are beginning to include species that occasionally attack people, such as calls for better protection of sharks. The Victorian government placed a stinging bull ant on its list of threatened species deserving protection, and provided a water supply to help the rare but drab Mt Donna Buang wingless stonefly.

I don't want less spent on mammals and birds. But I would like a discourse on favouritism that lifts public concerns about funding shortfalls. As one of the world's wealthiest countries, we should be doing much more to help our wildlife. The Christmas Island forest skink attracted very little government assistance and can't now be saved. But Australia has many species that would benefit from a more inclusive approach to conservation.

We can all help with that by donating to campaigns that benefit less charismatic species and by making our voices heard on social media and to relevant organisations and governments. When we see favouritism at play, we need to remind the public and the powers that be that many Australian species are not getting a fair go.



TIM LOW lives in a state of perpetual surprise at everything wild and alive. Read more from him at his blog on the AG website.

12 Autumn favourites



3
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