

WA'S PARKS, WILDLIFE AND CONSERVATION MAGAZINE

LANDSCOPE

Volume 36 Number 3 Autumn 2021 \$7.95

RISKY BUSINESS

Prepare and
beware

What's in a name

Deciding park
names

Fast vs slow

Completing end-to-ends

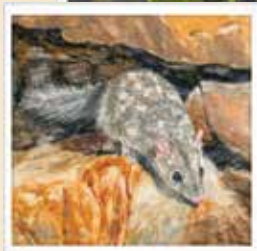
I don't like crickets

Lunch with lizards

Nature's pin ups

PRINT COLLECTION

Artwork featured in *LANDSCOPE* magazine



Each edition of *LANDSCOPE* magazine features works by artists Gooitzen van der Meer and Gwendolen Monteiro.

Using a water colour technique or acrylics, the pieces depict species featured in the magazine. Prints of these beautiful pieces of artwork can now be purchased in A3, A4 or A5 size, printed on high quality art paper and delivered to your door, ready to be framed and hung somewhere special.

Proceeds from your purchase go towards managing and conserving WA's plants, animals and natural environment.

To see the collection visit shop.dbca.wa.gov.au/collections/prints



ON THE COVER

Front cover Karlijini National Park.
Photo – Tourism WA

Back cover Hancock Gorge, Karlijini National Park.
Photo – Tom Mueller/Alamy

The beauty of Western Australia's natural areas is undeniable, from rugged coastlines, to dense forests and vast red desert plains. While this spectacular landscape yields excitement and wonder, every great adventure comes with a level of risk.

It is the responsibility of land managers to provide infrastructure, advice and up-to-date safety information so visitors can make good decisions. It is our shared responsibility to ensure those risks are known and planned for and we each must take responsibility when we set foot into WA's great outdoors.

While it's easy to assume that local Western Australians are better placed to understand the risks involved with spending time in nature in WA, around 75 per cent of the incidents, injuries and fatalities that occur in national and marine parks and reserves involve local residents (see 'Risky Business' page 12).

It's not unusual to think 'it won't happen to me' but the reality is, it just might. Heat stroke and drowning are the two most common causes of fatalities in WA's conservation areas. DBCA's Parks and Wildlife Service rangers often hear about people who head out on a hike with only a small water bottle and require medical assistance a short time later.

It is fantastic to see the significant increase in numbers of people visiting WA's parks and more people than ever have been getting outdoors for some much needed physical and mental health boosts from nature (see 'Embracing biophilia', *LANDSCOPE* Spring 2020).

WA is too good to experience only once, which is why we want everyone to stay safe so they can come back time and again. It's not just about signs and digital information, it's about respect for nature, for each other and for ourselves.

Jason Foster, Executive Director, Regional and Fire Management Services
Department of Biodiversity, Conservation and Attractions



Contributing

Morgan Marsh is the Executive Director, Corporate and Business Services at DBCA and has been with the department for 12 years. As a passionate triathlete and advocate for an active lifestyle, she spends a lot of time outdoors and her sporting endeavours have seen her compete in some of the most picturesque locations in the State and around the world.



Roger Underwood has worked in forest and land management in WA for more than 50 years. He has written widely about forestry, bushfire and botanical history and his books include *A botanical journey - the history of the WA Herbarium*. He lives on a small property at Gwambygine, where he has established an arboretum of WA's most beautiful trees.



Dr Sophie Cross is a behavioural and restoration ecologist at Curtin University. She has a passion for all things reptilian and is an avid wildlife photographer. Sophie currently researches how mining activities and habitat restoration impact animal communities. She currently works as research associate at Curtin University, in the ARC Centre for Mine Site Restoration and Curtin University Behavioural Ecology Lab.



Editor Lauren Cabrera.

Editorial assistance Emma de Burgh.

Scientific/technical advice Margaret Byrne,
Steve Crawford, Lesley Gibson, John Huisman,
Lachie McCaw.

Special thanks to Andrew and Marilyn Burbidge.

Design and production coordinator Tiffany Taylor.

Design Katie Bryden, Lynne Whittle,
Gooitzen van der Meer.

Illustration Gooitzen van der Meer.

Cartography Promaco Geodraft.

Business management Nitin Solanki.
Phone (08) 9219 9002.

Prepress and printing Advance Press,
Western Australia.

All material copyright. No part of the contents
of the publication may be reproduced without
the consent of the publishers.

Maps should be used as a guide only and
not for navigational purposes.

ISSN 0815-4465

Please do not send unsolicited material,
but feel free to contact the editors by email
(landscape@dbca.wa.gov.au).

Published by the Department of Biodiversity,
Conservation and Attractions, 17 Dick Perry
Avenue, Kensington, Western Australia.

© State of Western Australia, March 2021.

Subscription information

Annual subscriptions to *LANDSCOPE* are available
for \$33* (four issues plus free postage within
Australia). *Overseas subscriptions add \$22.

For more information contact us:

On the web shop.dbca.wa.gov.au

By email landscape@dbca.wa.gov.au

By phone (08) 9219 9903

By free post Reply Paid 25, Locked Bag 29,
Bentley DC, Western Australia 6983

To purchase *LANDSCOPE* online, visit
shop.dbca.wa.gov.au/landscape

   @waparkswildlife



*LANDSCOPE is printed on
recycled paper which is certified
carbon neutral, contains
55 per cent recycled fibre and
is made from pulp, which is
derived from well-managed
forests, controlled and
recycled sources.*

This page Gould's monitor (*Varanus gouldii*).
Photo – Sallyanne Cousins



Department of Biodiversity,
Conservation and Attractions

Features

- 8 Parks for People: William Bay National Park**
Explore the home of WA's famed Elephant Rocks
- 12 Risky business**
Staying safe in the outdoors
- 18 What's in a name?**
The meaning behind the names of natural places
- 24 Touched by nature: George Brockway**
The forgotten conservationist
- 28 I don't like crickets, I love them**
Exploring the diet of varanid lizards
- 35 A hare in a tortoise race**
Breaking world records on WA's long-distance trails
- 40 Adventure out: Choose your own adventure**
Completing the Eagle Bay Epic adventure race
- 44 Houtman Abrolhos: A seabird haven**
Thirty-year study of Abrolhos islands seabirds
- 50 Blooming surprise**
Toxic algal blooms in Perth rivers

Regulars

- 3 From the desk of Jason Foster**
A foreword from Executive Director, Regional and Fire Management Services.
- 6 Bush Telegraph**
Short stories from around the State, reader's pic and a guest word.
- 11 Discovered**
Diamond squid (*Thysanoteuthis rhombus*).
- 43 In Review**
A collection of books and applications.
- 53 Kaleidoscope**
Connecting kids with nature.
- 54 Nature's pin-up**
Splendid fairy-wren (*Malurus splendens*).



**Snap
shot**



READER'S PIC

Tawny frogmouth

(Podargus strigoides)

Photo and words by Leigh Sarah Scott

"I have walked past this specific tree numerous times, oblivious to the residents who had made it their home. Perched on an obviously comfortable branch, feathers all puffed up and snuggled close together were a pair of tawny frogmouths. With their beautiful patterns and colours so convincingly matching the surrounding habitat these two were awake but obviously not too impressed about having a photo taken!"

Have you got a fantastic nature photograph you would like to see published in *LANDSCOPE*? Send it, along with a 100-word description of the species or how and where you took the shot, to landscape@dbca.wa.gov.au.

**New boat ramp for
Canal Rocks**



Above Canal Rocks, Leeuwin-Naturaliste National Park.
Photo – Shem Bisluk/DBCA

Boating and fishing enthusiasts can soon enjoy new and improved facilities at Canal Rocks near Yallingup.

The current boat ramp has been operational since the 1970s, with new facilities constructed adjacent to the old ramp in 2002. Over the past decade, it has been at risk of closure due to safety concerns associated with its use.

Offsite works have now commenced on the pre-fabrication of the jetty steelworks and concrete ramp deck sections.

In mid-January the site closed for the onsite construction phase of the project and in April, the new and safe boating facilities are set to be open.

**2020 Aussie Backyard Bird
Count results**

In its seventh year, the BirdLife Australia's *Aussie Backyard Bird Count* saw record-breaking numbers of people heading to their backyards and local green spaces to count their local birds.

More than 108,000 people took part in the count in 2020, including more than 1500 schools, and they counted more than 4.6 million birds.

"Overall, rainbow lorikeets finished on top of the list throughout Australia, with more than half a million counted this year," BirdLife Australia's chief bird nerd, Sean Dooley said.

In WA, the top three birds counted were native New Holland honeyeaters, and introduced rainbow lorikeets and galahs.



Above New Holland honeyeater (*Phylidonyris novaehollandiae*).
Photo – Matt Swan/DBCA

Guest column

Joe Ross,
Director, Bunuba
Dawangarri
Aboriginal Corporation



Non-Aboriginal people are an amusingly unimaginative lot when it

comes to naming places – Deadhorse Creek, Bullfrog Hole, Geikie Gorge, Alice Springs. These names reveal little about the places they label, and little about those who named them. They often reveal absences – of loved ones, of white superiors and surveyors, of foreign landscapes.

Geikie Gorge was named in 1883 in honour of Sir Archibald Geikie, the head geological surveyor for Great Britain and Ireland. Geikie never travelled to Australia, never saw my mother's country that was given his name and never met a Danggu person who are the custodians of this place.

We call this place Danggu, and since 2016, so does DBCA. Danggu is also us, she is our mother, we are Danggu and Danggu is us. She inspires us to dream, she stokes the fires in us to protect her waters and all the life that she sustains. The place and the people have always been inseparable and will forever remain so.

The clan of Bunuba people who belong to Danggu know that their mother is a place beyond static lines imposed on cartographic sheets. To know Danggu is to be synchronised with her seasonal heartbeat, pulsations of spiritual guidance providing sustenance to her children.

So, we are glad for the maps to now name our place Danggu. Our partnership with DBCA – who we still call CALM because names do kind of stick – is something we value enormously. These European names given to places on our country – Geikie, Leopold Ranges – might also stick, for a generation or two.

Yet over time, we hope that acknowledging the Bunuba names, adopting them, their use by governments and others, might signify a deepening respect for the unbreakable bond between us mob, and our country – and the responsibility that bond gives us to protect our country, because she is us and we are her.



New Matilda Bay interpretation node



Above Whadjuk Elder Theresa Walley and WA Parks Foundation Chair, the Hon Kerry Sanderson AC, CVO, at the official opening of the Matilda Bay interpretation node.

Photo – DBCA

The newly completed interpretation node installed at Matilda Bay Reserve is a collaborative project between DBCA's Parks and Wildlife Service and the WA Parks Foundation, made possible by support from Woodside. It promotes the historical values and connection traditional owners have with the Matilda Bay area and the Swan River. It is the eighth node to be developed as part of this project which aims to develop a network of interpretation nodes along the foreshore paths located at key sites of environmental, historical, and cultural significance.

Keeping WA myrtle rust free

Myrtle rust (*Austropuccinia psidii*) is an introduced and highly invasive fungal disease of plants that spreads quickly and can have a substantial impact, especially given it is airborne.

Myrtle rust has not yet been recorded in Western Australia or South Australia, but it is a serious threat. The plant disease attacks and kills plants in the Myrtaceae family including eucalypts, bottlebrushes, paperbarks and peppermint trees.

The more people that know about myrtle rust, what it looks like, how to report it and how to maintain good hygiene to prevent it, the better. Report any suspected sightings immediately:

- MyPestGuide™ app (available on the App Store and Google Play)
- mypestguide.agric.wa.gov.au
- DPIRD Pest and Disease Information Service: (08) 9368 3080 or padis@dpird.wa.gov.au



Top right The department sent a range of myrtaceous plants to the eastern states to test them for susceptibility to myrtle rust.

Photo – Geoff Pegg

Above right Bright yellow myrtle rust spores, shown here on a wandoo leaf are one of the major signs of the plant disease to look out for.

Photo – Louise Morin



William Bay National Park

About 1.5 billion years ago, the granitic rocks along the south coast of Western Australia began to form. Once a great mountain range, they slowly weathered away to form rounded outcrops and boulders that protect secluded beaches from the Southern Ocean.

William Bay National Park, just 15 minutes west of Denmark, is revered for its turquoise green waters, white sandy beaches and giant granite rocks. Windswept headlands and

Top Elephant Rocks.

Photo – Marc Russo

Above Greens Pool.

Photo – Bron Anderson/DBCA

Above right Australian sea lion.

Photo – Jon Pridham/DBCA

large granite outcrops sweep down to meet the Southern Ocean and tranquil bays and white beaches lie between the towering rocks. Huge oval boulders resemble a herd of elephants, paddling in the shallow waters at the famed Elephant Rocks.

Sheltered from the power and force of the Southern Ocean by huge granite boulders, Greens Pool is one of Western Australia's most iconic beaches. The calm, clear water makes it a perfect place for swimming and snorkelling. Protected from fishing, a myriad of sea creatures call Greens Pool home.

The popular 1000-kilometre Bibbulmun Track passes through William Bay National Park and takes walkers through many different vegetation types while offering spectacular views of the southern coastline. Cyclists can also enjoy the park along a section of the Munda Biddi Trail – a 1000-kilometre world-class cycling trail.

Upgrades to the park were completed in late 2020 making it easier to enjoy the incredible natural beauty of the area.

A WILDLIFE HAVEN

One of the drawcards of William Bay National Park is its diversity. The park boasts



more than 470 plant and animal species, with some species endemic to the area. Hidden pockets of karri forest, Warren River cedar and shady groves of peppermint trees shelter many different species of mammals, birds, and insects. And, in the spring, the coastal heathlands are peppered with wildflowers.

The park is a haven for wildlife. The calm waters of Greens Pool are abundant with marine life while hooded plovers and fairy terns nest on the pristine beaches. Magnificent birds such as eastern ospreys, splendid and red-wing fairy-wrens, sooty and pied oystercatchers, also call the park home.

CULTURAL HISTORY

Aboriginal people are thought to have occupied the area for up to 50,000 years. Through the eyes of the traditional owners of the area, the Menang people, this area is rich in value. The plants provide food, medicine, shelter, and tools and the landscape provides habitat to an abundance of animals. Aboriginal ranger

groups care for country by sharing the stories and lessons of the past to future generations and complete customary activities on country.

NEW AND IMPROVED

In 2019, the State Government invested \$4.4 million over two years to rejuvenate the ageing visitor infrastructure in the park.

Completed just in time for summer 2020, the upgrades have enhanced the overall visitor experience. The park's spectacular and natural beauty draws almost 300,000 visits by locals and tourists each year and this number is expected to rise as more people get out to explore the south coast of WA.

Traditional owners from several families were engaged throughout the project to ensure Aboriginal heritage values of the area were considered, including checking there was no disturbance to cultural values; supporting on-ground projects that protect cultural sites around the park; and initiating cultural mapping.

Clockwise from top New signs at Greens Pool. Access to Greens Pool. Photos – Cliff Winfield; Bull banksia (*Banksia grandis*). Photo – Bron Anderson/DBCA; Fairy tern (*Sternula nereis*). Photo – Jiri Lochman; Splendid fairy-wren (*Malurus splendens*). Photo – Sallyanne Cousins

Below Cyclists enjoy the park's coastal scenery on a section of the Munda Biddi Trail. Photo – Peter Nicholas/DBCA



Hear more about William Bay National Park

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.



Parks for people William Bay National Park



The visitor experience has been improved with the completion of new roads and carparks, toilet blocks, picnic tables and signage. The upgrade included sealing 2.6 kilometres of Madfish Bay Road, enabling easier and safer access to the eastern end of the park, and allowing the provision of more than 200 parking bays, including disabled access bays, across the park. Three new accessible toilet and changeroom facilities have been built at Greens Pool, Elephant Rocks and Madfish Bay.

Safer roads, improved parking facilities and improved pedestrian pathways will cater to the high visitor numbers at William Bay National Park, helping to drive tourism in the area. It's important to note the park is very busy during peak periods, such as school holidays, and visiting outside

these times may lead to a more rewarding experience.

Local people have a long-held affection for the park and the William Bay National Parks Association has a dedicated team of around 50 volunteers. These local residents regularly carry out activities such as weeding, beach clean-ups, Bibbulmun Track maintenance and assisting park rangers.

WHAT'S NEXT

The next stage of the renewal project is now underway and will include access paths to the beach, new interpretative signage and a lookout. Future stages will see the completion of new trails, making travel around the William Bay and Denmark areas easier than ever before.

Top Eastern osprey (*Pandion cristatus*).
Photo – Sallyanne Cousans

Above Granny bonnets (*Isotropis cuneifolia*).
Photo – Bron Anderson/DBCA

Do it yourself

Where is it? 14 kilometres south-west of Denmark

Total area: 1700 hectares

Recreational activities: Diving, snorkelling, swimming, surfing, fishing, bushwalking

Nearest Parks and Wildlife Service office: Frankland District office, South Coast Highway, Walpole 6398. Phone: (08) 9840 0040.

Discoveries can be made in a multitude of ways. New species do not often leap out and announce themselves, and it can take years of experience to firstly recognise that something is potentially new, then to undertake the necessary research to prove it is in fact unique.

New species are often found in herbarium and museum collections many years after they were collected. Most biological surveys aim to maximise the collecting outcome by gathering all of the species that are present in a particular area. If specimens belong to taxonomic groups for which no immediate expertise is available, they may sit unidentified for years.

The subject of the present article does not belong to a herbarium or museum collection, and is not a new species, but certainly fits the narrative of a discovery, even if it is only a personal revelation, a mystery that has puzzled me for many years.

In February 2006, I was participating in a marine biology survey of Scott Reef, more than 300 kilometres off the coast of north-west Western Australia on the edge of the continental shelf. Scott Reef is massive reef system comprising two separate atolls, the horseshoe shaped South Reef and the slightly smaller, circular North Reef. Combined, the two reefs and their lagoons cover an area of approximately 250 square kilometres.

Towards late afternoon I was snorkelling at high tide on the reef flat, in around two-or-three-metre depth water, when I noticed an unusual spiral organism, something I had never seen before, floating just beneath the surface. Curiosity suitably aroused, I approached it slowly, taking photos as I went.

Close viewing didn't help me identify this strange creature, which bore a striking resemblance to a 'slinky', the children's toy. It was about two metres long, composed of a long strand, coiled into a spiral of about 15 centimetres diameter. I took several general shots, and then also some macro images of the structure of the strands.

Thinking that what I was seeing was so distinctive that someone will know what it

is, I headed back to the boat, sure that my strange creature would be easily identified. Back on board I showed people my images, to a universal response of 'no idea'.

The macro shots showed that the strands were clear (probably mucilage) and contained thousands of spherical bodies, which I guessed might be eggs. But what might have laid them? It must surely have been something large to produce an egg mass of this size.

Like most people, I sought an answer in books and on the internet. Initially it was thought to be a pyrosome, a rather odd looking free-floating colonial tunicate that can reach a remarkable size of up to 18 metres long, but the structure was totally wrong.

I posted the images to various sites and was offered some suggestions, but eventually these also settled on eggs of an unknown source. My searching did reveal other images of the same spiralled egg mass, some with suggestions that it was a stinger to be avoided.

Recently I was browsing an underwater photography magazine and happened

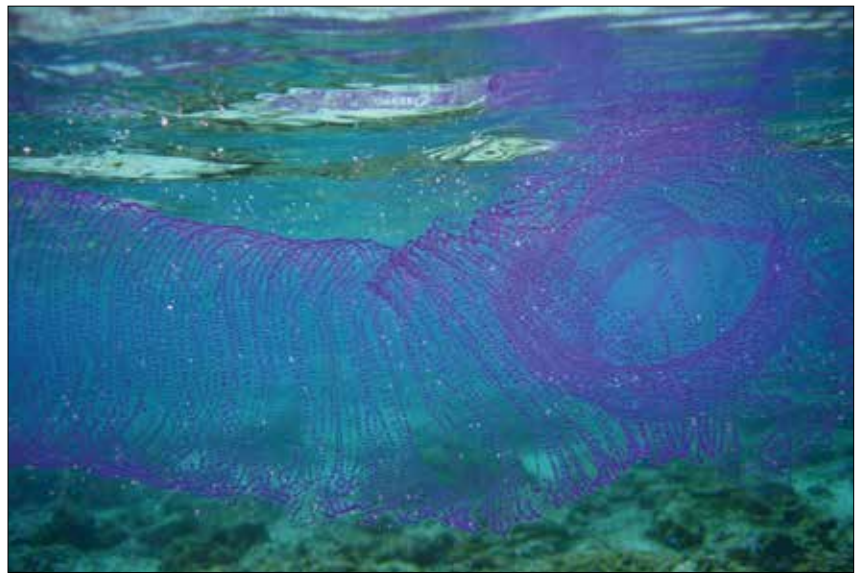
across an almost identical image of my mystery organism. It was identified as a pyrosome, but knowing this to be wrong my search for an identity was reinvigorated. To my surprise, this time I hit on the answer.

They are the eggs of the diamondback squid (*Thysanoteuthis rhombus*), a large squid that can grow up to one metre in length and 24 kilograms total body weight. These squid are found worldwide in tropical and subtropical seas. They have a unique social organisation (for squid), living throughout their life cycle in couples of similar sizes.

Encountering their eggs is a rare event. One of the articles I read noted that only a couple of dozen such egg masses had been recorded worldwide. So, mystery finally solved, and I can count myself among the select few that have seen these things in the wild.

Above Egg mass of the diamondback squid, Scott Reef.

Photo – John Huisman



Diamondback squid (*Thysanoteuthis rhombus*)



Risky business

As our desire to return to nature increases and more of us are out enjoying Western Australia's parks and reserves, the number of injuries and, sadly, fatalities is also on the rise. It is more important than ever to break our reliance on technology, know our limits and understand the risks well ahead of taking a step into the outdoors.

by Michael Phillips



The number of visitors to national parks and reserves is on the increase, as locals and visitors make their way outdoors to counterbalance the increasing density of our urban lives.

The average size of the Australian backyard is decreasing and so is our common knowledge about the risks that are present in the outdoors.

Fewer of us know through experience about how to deal with outdoor risks such as snake bites, extreme weather conditions and getting lost in the bush.

As a result, when something goes wrong, we are less inclined to think it is something we should have known and more likely to say it is something we should have been told.

Sadly, the increase in fatalities in national parks in recent years is a stark reminder that we need to be prepared before heading into the outdoors.

INTO THE UNKNOWN

It's fair to say that every trip into nature comes with a level of risk. Some risks are well known, such as dehydration, rough terrain and sunburn. Other risks are less obvious such as strong currents, the effects of extreme heat and the remoteness of some locations.

For those who are not accustomed to being in the outdoors or international visitors unfamiliar with the Australian heat and conditions it is absolutely essential to plan ahead and prepare for your trip as much as possible before you leave home.

"You may think that interstate or international tourists have the most difficulty in WA parks," Michael Phillips,



visitor risk management coordinator from the Department of Biodiversity, Conservation and Attractions (DBCA) said.

"But in fact almost 75 per cent of the incidents involve Western Australians exploring their backyard.

"The common Aussie attitude of 'oh it won't happen to me' doesn't really stack up, as anything can happen to anyone if you are not prepared properly."

GO ANALOGUE

Our increasing reliance on technology can pose a safety risk if we are unable to get by without it. While many popular parks and attractions are becoming Wi-Fi enabled for safety reasons, some picturesque locations are as remote and dangerous as they come.

Concerningly, how we learn and what information we retain has been impacted by the fact that the answer to any question is always instantly available in the palm of our hand. Digital technologies can help us acquire the information, but it is up to us to retain it, in the event those technologies are not available. Planning and researching are the first and most important steps when considering spending time in nature, and we need to truly understand those risks before we step out into the outdoors.

Safety information is available in almost every possible format, both analogue and digital.

"Interpretive signage is present in parks at key locations and not only provides interesting information about the area and its cultural history, but also

Previous page

Main Visitors sitting dangerously at the cliff edge of Yardie Creek, Cape Range National Park.

Photo – Jennifer Eliot/DBCA

Inset Warning sign at Yardie Creek.

Photo – DBCA

Above Natural Bridge in Torndirrup National Park can be a dangerous part of the coastline near Albany.

Photo – Mike Shephard

key safety messaging," Michael said.

"Emerging technologies such as personal locator beacons are becoming more budget friendly and can certainly be useful if things do go wrong."

POPULARITY CRISIS

Some parks in Western Australia are suffering from a crisis of popularity. Popular natural icons such as Nature's Window in Kalbarri National Park, The Gap and Natural Bridge in Torndirrup National Park and the falls in Serpentine National Park can have queues of people waiting during peak season, at times putting themselves and others in danger to get that perfect selfie.

Multi-day trips require more detailed planning but even an afternoon visit to a local park with friends and some smiling posts on social media could result in serious consequences if the risks aren't properly known and warnings aren't adhered to.

Some popular tourist sites around the world have been closed permanently or have limited access in an effort to reduce the number of injuries and deaths.

View park safety videos

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.



NOT WHAT YOU KNOW

Heat stroke, slips and trips, falls from rock ledges, wandering off designated trails and drowning are the most common causes of death and injury in national and marine parks.

Even in seemingly harmless swimming areas such as Lane Poole Reserve in WA's south-west, temperatures in the air above the popular Island Pool section of the Murray River can be in the mid-thirties, but if you swim under the water far enough, it can reach below four degrees.

Top Serpentine National Park.

Photo – Tourism WA

Above Personal locator beacon.

Photo – Rebecca Roth/NASA

Above right Bungle Bungle Range, Purnululu National Park.

Photo – Tourism WA

Right Stirling Range National Park.

Photo – Ann Storrie

The shock to the system can be enough to risk drowning.

Rangers are often told by people involved in swimming incidents that they are good swimmers, however swimming in natural water bodies is very different from swimming in a pool.

“People also commonly bring a small bottle of water with them on a walk

thinking it will be enough and end up suffering from exhaustion, dehydration and heat stroke,” Michael said.

The reality is, while your safety is the concern of park rangers and emergency services, it is your responsibility to make sure you're prepared before you even take a single step into the great outdoors.



Before you go:

- Know the park, its conditions, hazardous landscape features, insects and wildlife
- Check what facilities are available
- Check forecasts and use weather and sun protection
- Check for bushfire warnings and other information such as park closures
- Notify people you trust
- Know your limits
- Ensure your equipment is appropriate
- Carry enough drinking water
- Carry a first aid kit



Find up-to-date information on park and trail closures at alerts.dbca.wa.gov.au



It's important to do some research before heading to any park, but we've put together a list of parks where you may encounter some more serious risks.

Staying safe north of Perth

1 Nyinggulu (Ningaloo) Coastal Reserves

Main risks: Swimming, rips, unpatrolled beaches, boating risks

 **Ranger's tips** The Ningaloo Coast World Heritage Area is in the hot and arid tropics of north-west Australia. Summer temperatures often exceed 45 degrees Celsius. Visitors planning to drive to the Ningaloo Coast should be cautious when travelling after sunset, as the large number of kangaroos and other animals make driving hazardous. There is no drinking water available in Cape Range National Park or Nyinggulu Coastal Reserves. When boating, swimming or snorkelling, keep in mind that ocean conditions can become hazardous quickly, especially near gaps in the reef. If in doubt, don't go out. Tropical cyclones are occasionally experienced between November and April and summer visitors are advised to listen for cyclone warnings.

2 Karijini National Park

Main risks: Extreme heat, cliffs and gorges

 **Ranger's tips** Karijini's impressive gorges have very high vertical cliffs, and cliff edges can be loose and unstable. Flash floods can occur in the gorges. Do not enter the gorges during or after heavy rain. During summer, temperatures frequently exceed 40 degrees Celsius so carry plenty of water at all times when undertaking walks and other activities. Wear sturdy walking shoes, use good sun protection, and take plenty of water. Stay on established trails and stand well back from cliff edges. Water temperatures may be very low in deep gorges during the cooler months of the year.

3 Mount Augustus National Park

Main risks: Dehydration, heat stress, heat stroke, isolation

 **Ranger's tips** A personal locator beacon (PLB) is essential. Wear sturdy footwear and protective clothing. There is no drinking water in the park. Do not expect to find water in natural watercourses, even in winter, so always carry enough for your own needs. Heat stroke can kill and summer temperatures are extremely high. Carry and drink three to four litres per person per day. Be aware that if a natural water source is available, it will need treatment to make it safe to drink. Treatment can be boiling for at least one minute, mechanical filtration or chemical treatment.

4 Kalbarri National Park

Main risks: Cliffs and gorges, extreme heat when walking the gorges during hotter months

 **Ranger's tips** Summer heat can be extreme, particularly on the Loop Trail. Do not hike in hot weather. Carry and drink three to four litres of water per person, per day when walking. Wear a hat and loose, long-sleeved clothing. Walk in the cooler times of day. Hike the longer walks in the cooler months (April to

Above Turquoise Bay, Cape Range National Park.

Above right Hikers heading to Joffre Falls, Karijini National Park.
Photos – Tourism WA

Below Emergency satellite phones are in place at Kalbarri National Park.
Photo – DBCA



Karijini National Park

October). Hike the Loop Trail before 7am (November to March). Drinking water is not available in the park so always carry your own supply. Keep well clear of the water's edge near coastal cliffs. Massive wave surges have claimed lives. The edges of the cliffs and gorges are unstable and undercut. Stay clear of cliff edges and overhangs.

5 Nambung National Park

Main risks: Extreme heat

 **Ranger's tips** Summer days between December and March are usually hot and dry. During this time the fire danger may be extreme.





Stirling Range National Park



Staying safe south of Perth

6 Penguin Island

Main risks: Crossing the sandbar is dangerous due to weather and ocean conditions

Ranger's tips Weather conditions can change quickly, making crossing the sand bar very dangerous. The Parks and Wildlife Service strongly recommends against walking the sand bar to reach the island. When you're visiting the island, remain on the boardwalks, walk trails and sandy beaches, and stay clear of limestone cliffs, caves and overhangs as they may be unstable and prone to collapse.

7 Leeuwin-Naturaliste National Park

Main risks: Rock fishing, slippery rocks, strong currents, unpatrolled beaches

Ranger's tips Consider travelling with a PLB. In the event you need to be rescued, it could save your life. Exercise extreme caution near cliff edges especially when fishing. Supervise children at all times. Always be aware of your surroundings and pay attention to visitor risk warning signs. They are there to alert you for your protection and safety.

8 Stirling Range National Park

Main risks: Extreme and changing weather risks, veering off trails, heat risk

Ranger's tips Bushwalking is not recommended in hot and windy conditions due to the risk of bushfire. Carry and drink plenty of water – three to four litres per person per day. Wear sun protection, boots or sturdy footwear, and clothing that is weatherproof and

scratchproof. Be prepared for unexpected changes in the weather. Sloping, rough and uneven surfaces exist throughout the park. Take extra care near rock edges as they can crumble without warning or be very slippery.

9 Torndirrup National Park

Main risks: Rock fishing risks at Salmon Holes, slippery rocks

Ranger's tips Rock fishing is extremely dangerous on this coastline and is not recommended. It is mandatory to wear a PFD while fishing at the Salmon Holes if you are venturing onto the rocks and use of rock anchors is strongly encouraged. The Torndirrup coast has a notorious record for accidents and deaths due to people slipping or being washed into the ocean by large waves, gusting winds or extra large swells. Please exercise extreme caution and don't risk being the next victim. Always be aware of your surroundings and pay attention to visitor risk warning signs.

10 Long trails – Bibbulmun Track, Munda Biddi Trail and Cape to Cape Track

Main risks: Navigational errors

Ranger's tips Plan well ahead and study the area you're going into. You don't have to go far before you can be on an isolated track, the weather changes or you encounter wildlife. It is always advisable to stay on existing tracks. If you get lost, stay where you are. You'll be found sooner if you don't stray from tracks. A PLB is essential.



Torndirrup National Park

Millions of visitors enjoy their time in national parks and reserves with visitor satisfaction consistently above 90 per cent, but things do go wrong due to people being unprepared or undertaking risky behaviours.

Top left Stirling Range National Park.
Photo – David Bettini

Top Sandbar at Penguin Island.
Photo – Peter Nicholas/DCBCA

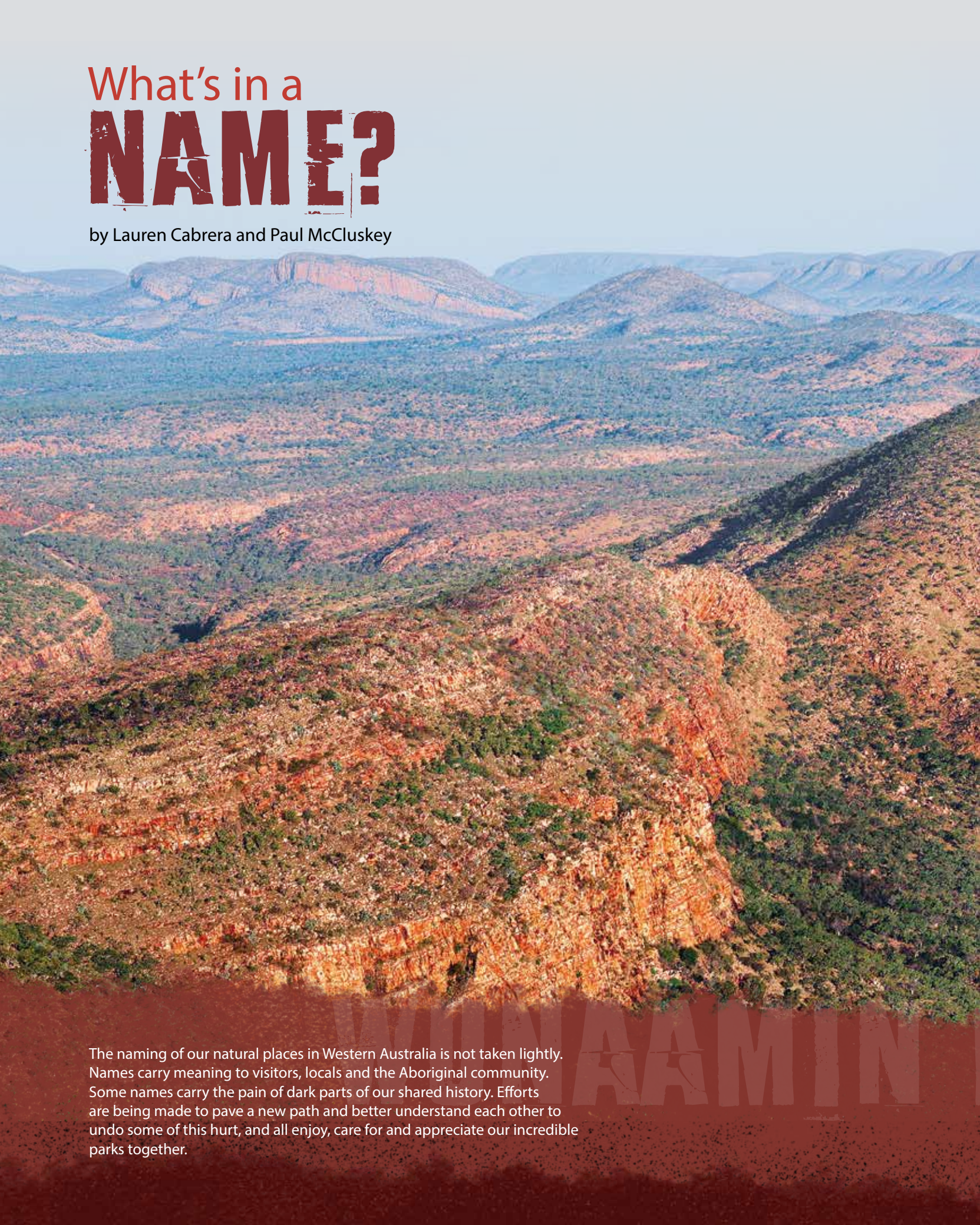
Above A near miss for rock fishers at Salmon Holes.
Photo – DBCA

Michael Phillips is the visitor risk management coordinator with DBCA's Parks and Wildlife Service. He can be contacted at michael.phillips@dbca.wa.gov.au or (08) 9290 6130

For more information about park safety visit explore.parks.dbca.wa.gov.au/safety

What's in a **NAME?**

by Lauren Cabrera and Paul McCluskey



The naming of our natural places in Western Australia is not taken lightly. Names carry meaning to visitors, locals and the Aboriginal community. Some names carry the pain of dark parts of our shared history. Efforts are being made to pave a new path and better understand each other to undo some of this hurt, and all enjoy, care for and appreciate our incredible parks together.



MILIWUNDI MANUCL

Juliet Capulet once asked what's in a name, questioning the arbitrary labelling of a family name that forbade her romance with Romeo. While all is fair in love and war, the naming of places is anything but arbitrary.

A name represents connection, an identity and makes a first and lasting impression. Names of geographic places such as national parks, picnic and camping areas, and other natural assets are very meaningful to local communities.

For park visitors, including emergency services, names are a reference to describe the location or 'address' and identify where a place is and guide visitors to and around the park.

For Aboriginal peoples, names of places are intertwined with lore and spirituality and are intrinsically attached to their understanding of its history, culture, rights and responsibilities to the land. Names feature in stories and songs, traditionally passed down through oral histories rather than written language.

Each traditional owner group has their own words for how they describe their connection to the land and how it makes them feel. What is shared is the deep, entrenched notion that country, health, spirit and wellbeing are all connected to land and specific places.

As an example, the relationship of Yawuru people to country is expressed through liyan. Liyan comes from Yawuru peoples' connection to country, ancestors and Yawuru way of life. It reflects a sense of belonging to Yawuru society, and represents the feeling people hold, individually and collectively, particularly when they are on their country.

Mabu liyan (good liyan) expresses Yawuru peoples' emotional strength, dignity and pride. The guiding principle for good management of Yawuru country is

"For Aboriginal peoples, names of places are intertwined with their lore and spirituality and intrinsically attached to their understanding of its history, culture, rights and responsibilities to the land."



that Yawuru people have to maintain good, clear liyan with the country within the modern, ever-changing world.

NOMENCLATURE NEEDS

In Western Australia, the Geographic Names Committee (GNC) provides independent advice to the Minister for Lands on geographical naming issues, taking into account the different points of view, from local communities, professional institutions, the Aboriginal community and government agencies. The GNC applies policy and procedures for the naming of geographical places and features.

Landgate is the custodian of the State's nomenclature database, which contains official names and coordinates of geographic features in Western Australia including the official spelling of the name, feature type, classification, derivation, map number, coordinates and any alternative and historical names.

When geographical features managed by the Department of Biodiversity, Conservation and Attractions (DBCA) are being named in WA, DBCA's Parks and Wildlife Service has corporate

Previous page

Main Wunaamin Miliwundi Ranges (formerly King Leopold Ranges).

Photo – David Bettini

Above Murujuga National Park.

Photo – Marg Bertling

guidelines and a committee that ensures new names are, wherever possible, short; confined to one word; meaningful and appropriate; and specific to the area, feature or asset (for example, a local Aboriginal name, name of an explorer, pioneer, settler or the name of a person who has performed outstanding scientific or community service), in compliance with the GNC policy and procedures.

ABORIGINAL NAMES

In recent years, Aboriginal engagement has expanded and developed to involve almost every aspect of the department's work including reserve creation, science, recreation, tourism operations, conservation and land management, fire management, wildlife management and heritage protection, much of which is being enabled through formal and informal joint management and partnership initiatives.

Cultural protocols are closely adhered to when traditional names are being



provided to areas, features and assets managed by the department.

Aboriginal people are involved and consulted as much as possible for the naming of new conservation areas and their features. For many years, the Parks and Wildlife Service has been applying Aboriginal names to parks and geographical features within parks as part of the process to establish joint management of parks and reserves.

The use of Aboriginal names is strongly encouraged, and names are provided at the recommendation of an Aboriginal corporation and confirmed by a language centre where available. In some areas, agreements with the traditional owners have been made to assist in identifying names, such as with the Miriuwung Gajerrong people near Kununurra, Yawuru people near Broome



and Bunuba people near Fitzroy Crossing.

This use of Aboriginal names has gained momentum in more recent years, particularly in the Kimberley region. Bunuba, Wilinggin and Balangarra names have been approved for many parks. In Danggu (Geikie Gorge) National Park, Danggu means the area where the water is very deep under the cave. In Bandilngan (Windjana Gorge) National Park, Bandilngan is the name of the water pool within the gorge in which sits a large boulder. The pool is Rayi spirit site, where Rayi spirits come to women in their dreams, and the place where women would birth their children. In Dimalurru

(Tunnel Creek) National Park, Dimalurru is the name of the spring inside the gorge. Niiwalarra is the traditional name of Sir Graham Moore Island, which is now referred to as Niiwalarra Island.

LOOKING BACK

WA's natural places were named by Aboriginal peoples long before the arrival of Europeans, but during colonisation names of explorers, settlers and royalty were given to many places, parks and features.

In July 2020, the then Hon. Ben Wyatt MLA, the Minister for Lands and Aboriginal Affairs, declared that King Leopold Ranges were officially

Above Bandilngan (Windjana Gorge) National Park.

Photo – Tourism WA

Above right Dimalurru (Tunnel Creek) National Park.

Photo – Peter Nicholas/DBCA

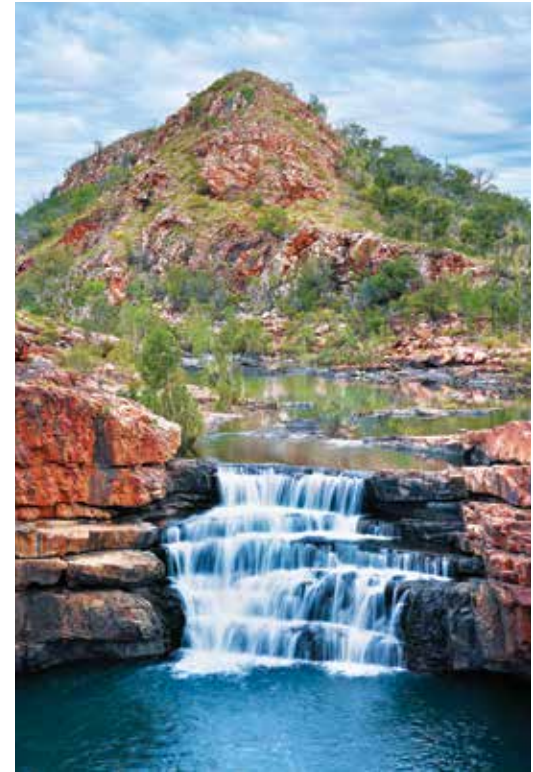
Right Niiwalarra Island (Sir Graham Moore Island).

Photo – Grace Patorniti/DBCA



Fun facts

- Geographic names are also known as 'toponyms' which are names that represent sites of human occupation (cities, towns, etc.), natural geographic features (mountains, lakes, bays, etc.) and bounded areas (states, localities, regions, etc.).
- The natural feature with the longest name in WA is Murrawong Gnulling Gnulling Pool, with 25 letters, on Yalgamine Creek, a small tributary of the Murchison River. The longest name near Perth is Ngangaguringguring Hill, with 18 letters.
- Interesting place names in WA include 'Siberia' - an abandoned Goldfields townsite 86 kilometres north-west of Kalgoorlie, 'Point Torment' - a peninsula near Derby swarming with mosquitos, and 'Monkey Mia' - a coastal spot near Shark Bay with no known monkeys and no consensus as to the origin of the name.



Top Ngangaguringguring Hill, Mundaring State Forest.

Photo – Dave Osborne/WalkGPS

Above Wooditjup National Park.

Photo – Ann Storrie

Above right The Aboriginal name for Bell Gorge in Wunaamin Miliwundi Ranges is Daimanyi.

Photo – David Bettini

Left Danggu (Geikie Gorge) National Park.

Photo – DBCA

renamed Wunaamin Miliwundi Ranges, incorporating Ngarinyin (Wunaamin) and Bunuba (Miliwundi) traditional names.

"It has troubled me for years that an extraordinary area of Western Australia should be named in honour of a person who is widely regarded as an evil tyrant with no connection to our State," Minister Wyatt said.

"The traditional owners of the region have always known the ranges by their own name, so, it's momentous to finally remove reference to King Leopold II and formalise the name."

While some retrospective name changes have been requested to remove a reference to a painful part of history, some are simply in response to local community support as a sign of respect for the traditional owners.

In 2018, Bramley National Park, north-east of the town of Margaret River, was renamed to Wooditjup National Park to reflect the area's significance to the Wadandi people. Wooditjup was formally adopted as the new name for the national park after consultation with traditional owners and the South West Boojarah Working Party.

Mundy Regional Park was named many years ago. Mundy (or Munday) was



Top 10 most common feature names in Western Australia

Number 1 Well	71	Gum Creek	11
White Well	68	Round Hill	11
6 Mile Well	46	Bald Hill	11
Red Hill	34	Black Rock	11
Sandy Creek	16	Rocky Pool	10

a leader of the Beelu (or Beeloo) people at the time of European settlement. The Beelu people occupied a district that was generally bounded by the Helena, Swan and Canning rivers.

Deep Gorge in Murujuga National Park has been named Ngajarli by the Ngarda-Ngarli, which means secret or sacred place.

SEEING DOUBLE

There are some parks and assets around the State that carry dual names, for example Lalang garram / Camden Sound Marine Park in the Kimberley. Lalang-garram, now spelt Lalang-gaddam, is a Dambeemangarddee word meaning the saltwater as a spiritual place as well as a place of natural abundance. Park names will soon be changed to the new spelling.

Dual naming is the approach whereby geographical places or features are officially recognised by two distinct names, with the Aboriginal name appearing first, separated with a solidus (/) preceded and followed by a space. A dual name may be considered as an intermediary step in the transition to an Aboriginal name. In some instances, although the official name is an Aboriginal name, use of the old name is retained on signs and in publications as an interim



measure until visitors become familiar with the new name. For example, Danggu National Park still includes Geikie Gorge on park signs, publications and websites.

Arguably the most famous name change was when the iconic Ayers Rock in the Northern Territory was renamed Ayers Rock / Uluru in 1993, before switching to Uluru / Ayers Rock in 2002 and today is commonly referred to simply as Uluru.

MOVING FORWARD

It is now standard practice for the naming of new parks and assets to have strong involvement from the Aboriginal community. This also comes at a time when there is growing interest and genuine desire by many people in the wider community to integrate Aboriginal words. Non-Aboriginal people are becoming more comfortable using Aboriginal words when referring to natural places.

Valuing Aboriginal traditions and stories of place enriches the landscape with meaning and connects people with place.

Using traditional names educates visitors about Aboriginal culture, acknowledges an ongoing ancient rich cultural heritage and strong partnerships with traditional owners, and supports maintenance of culture and reconciliation.

Above left Threeways, Doubtful Bay, Lalang garram / Horizontal Falls Marine Park.
Photo – DBCA

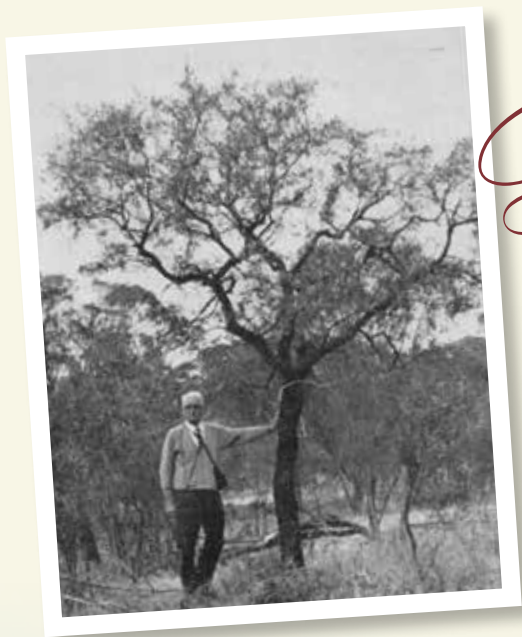
Above Nambung National Park was named in 1994 after the Yued Noongar word for the river that runs through the park.
Photo – Peter Nicholas/DBCA

Below Ngajarli (Deep Gorge), Murujuga National Park.
Photo – DBCA



Paul McCluskey is DBCA's capital works and asset management coordinator, the chair of the Parks and Wildlife Service names committee and a member of the State Geographic Names Committee. He can be contacted at (08) 9219 8576 or paul.mccluskey@dbca.wa.gov.au

Lauren Cabrera is a LANDSCOPE editor and can be contacted at (08) 9219 9903 or lauren.cabrera@dbca.wa.gov.au



George Brockway

the forgotten
conservationist

Roger Underwood's career was beginning just as George Brockway's was coming to an end, but their chance encounter and George's remarkable legacy inspired Roger not only to make his own mark on the conservation of Western Australia, but to make sure the world knew the story of his hero.

by Roger Underwood



My career in forestry and land management, and that of George Brockway, only just overlapped.

On my second day as a forest officer on 3 January 1963, I was in the old forestry office at Mundaring Weir, and was introduced to a visitor. This was George Brockway, visiting the scene of his first appointment as a forest officer in 1923, and now on the brink of retirement. He was softly-spoken and courteous, an old-fashioned gentleman, but his eyes spoke of many years spent in the most remote bushland of Western Australia. It was only later that I discovered that he was perhaps WA's greatest pioneering forester, a man who left a proud legacy in the fields of conservation and land management. I later trod many of the paths he had blazed, and he became my hero.

Over the years, the memory of Brockway's work and his many achievements faded. I began to think of him as 'the forgotten conservationist'.

FIRST FORESTER

Born and educated in Perth, he studied forestry at the University of Adelaide, and after graduation became our first WA-born professional forester. He joined the Forests Department when it was still in embryo form, the entire staff numbering less than 30, including clerks.

Aged only in his early 20s, Brockway was appointed district manager of the department's first field district at Mundaring. Mundaring was a key area, as its forests comprised the catchment area for the Goldfields Water Supply. Brockway had to start from nothing.

Luckily, he was a man of vision and boundless energy, and he soon set about pioneering systems of district administration and bushfire management that have survived to this day.

FIRST FIRE TOWER

His name is associated with the first fire lookout towers, the recruitment and training of the first fire crews, the first systematic approach to bushfire fighting,



the first planned fuel reduction burning, the first bush telephones and the first experiments with wireless. Within a few years Brockway's methods were being applied across south-west forests.

WHEATBELT WOODLANDS

In late 1920s, Brockway left the department for two years, to work with his brother as a surveyor on land classification in the vast virgin bushlands that later became the north-eastern Wheatbelt. Here he discovered his greatest love: the beautiful and valuable eucalyptus species of the inland.

Returning to the department, Brockway became a voice for bushland conservation. His great concern was wholesale fence-to-fence clearing in the Wheatbelt. He wrote a pamphlet for new settlers, urging them to retain areas of bushland on farms, citing the many benefits of trees, and he undertook surveys of prospective farming areas locating the best woodland areas and then ensuring their dedication as timber reserves in advance of alienation (most of these later became

Main The Great Western Woodlands.
Photo – Sallyanne Cousins

Inset far left George Brockway with a fine sandalwood tree.

Inset above left The lookout at Mount Gungin, WA's first fire lookout tower, constructed under the direction of George Brockway.
Photos – DBCA



part of the network of nature reserves that today dot the agricultural regions).

But his was truly a voice in the wilderness: almost nobody was interested in conservation in those days.

Brockway found his true vocation when he was appointed as officer in charge of the department's Goldfields and Wheatbelt regions, stationed at Kalgoorlie. He was the first professional forester to work in these areas. The jurisdiction, and the responsibilities, were enormous.

Over the next thirty years, Brockway devoted himself to conservation and

land management programs in these remote regions. He oversaw, and brought into line, the massive and previously unregulated firewood industry supplying the gold mines and pumping stations, and he oversaw the regeneration of woodlands after timber cutting.

This work included the vast area of eucalypt forest now known and revered as 'The Great Western Woodlands'. These woodlands, admired today for their beauty and biodiversity, are nearly all regrowth, regenerated under George Brockway's watchful eyes.

CHIDDARCOOPING

He also developed regulations governing the sandalwood industry, and the conservation of mulga on pastoral leases, and was responsible for the creation of numerous reserves. He almost single-handedly fought off attempts to alienate several valuable bushland areas,

including the Dryandra Woodland and the outstanding botanical treasure-trove in the Chiddarcooping Nature Reserve.

It was while he was inspecting Chiddarcooping that Brockway discovered the variety of *Eucalyptus caesia* that became known as Silver Princess, and which is now one of the most widespread garden ornamental trees in Australia. Another beautiful tree, the Dundas mahogany, was named *Eucalyptus brockwayi* after him.

NURTURING NATIVES

Brockway not only loved the inland trees, he collected specimens and mapped occurrences, he undertook research into propagation and silviculture, and he promoted their use as ornamentals. These passions led to three of his most famous achievements.

The first was the establishment of a nursery at Kalgoorlie, the first nursery in

"George Brockway was a hero of forest conservation and land management in WA and left a proud legacy..."



Previous page

Far left Dundas mahogany (*Eucalyptus brockwayi*).

Photo – Roger Underwood

Left The blossom of the variety of *Eucalyptus caesia* that became known as Silver Princess, first discovered at Chiddarcooping Nature Reserve by George Brockway.

Photo – Geraldine Buckley/Alamy

Inset The staff of the Forests Department circa 1923, George Brockway seated second from the right. Seated third from the left is Charles Gardner, at that time the departmental botanist, but later to become WA's Government Botanist and one of Brockway's close associates.

Photo – DBCA

Left and inset left The George Brockway Tree at Yilliminning.

Photos – Roger Underwood

Above Chinnock (*Eremophila maculata* subsp. *brevifolia*).

Photo – Andrew Brown

Australia to focus on growing native trees. The second was his involvement in the planting of street trees in Kalgoorlie, using the most beautiful trees of the region.

The third was the development of a new industry, collecting and exporting seed from tough inland eucalypts for use in land rehabilitation overseas (see 'Eucalypt emigrants', *LANDSCOPE*, Summer 1990–91).

TREES-ON-FARMS

Above all, George Brockway was the 'father' of the trees-on-farms movement. He wrote articles for newspapers, gave radio talks, visited farms, addressed public meetings and established arboreta of suitable trees. His message was that trees did more than beautify and protect the landscape; they would ensure the sustainability of agriculture.

Unfortunately, in all of this, he was a man before his time. During most of

his career, the focus of government was agricultural development, and the generation of settlers who had cleared the land showed little enthusiasm for its reforestation.

It was not until the 1990s, when all the problems of land degradation that Brockway predicted started to emerge, that a new 'landcare' ethos emerged, and farmers and land managers began applying the methods Brockway had originally advocated, but which at the time were ignored.

THANKS GEORGE

Every profession needs its heroes. People who have performed outstandingly, have left an indelible mark on their field, who are role models and exemplars. George Brockway was a hero of forest conservation and land management in WA and left a proud legacy; not simply the magnificent reserves and

regenerated woodlands in the Goldfields and Wheatbelt or the street trees of Kalgoorlie. He left an idea and a vision, an appreciation of the beauty of the inland bush, and the value of its trees in the recovery of degraded land.

It is appropriate that in a little ceremony at Yilliminning in September, 2020, a magnificent salmon gum was designated The George Brockway Tree. This ensures he is 'the forgotten conservationist' no longer.

Roger Underwood is a retired forester and a writer and historian and can be contacted at yorkgum@westnest.com.au.

Roger Underwood's latest book The York Gum Chronicles - adventures with Western Australia's most beautiful trees is reviewed on page 43



I don't like crickets, **I love** them

With searing summers, low rainfall and nutrient-poor soils, the Australian outback is a harsh place to survive, let alone thrive. A Curtin University research project is looking into the diets of monitor lizards to find out why these resilient reptiles are so well-adapted to these conditions.

by Dr Sophie Cross







Outback Australia covers a vast proportion of Australia, with approximately 70 per cent of Australia's landmass comprising arid or desert environments. The outback is a spectacular place, but these landscapes can be harsh and unforgiving. Summer temperatures frequently reach over 45 degrees Celsius, and rainfall tends to be low but highly variable. Combined with low rainfall, soils in arid environments tend to have low water retention and be extremely nutrient-poor. Rainfall is a primary driver of food productivity, and arid environments tend therefore to be resource-poor and low-productivity habitats.

Limited food availability significantly influences the species capable of surviving and persisting in arid environments.

Large mammalian predators tend to be constrained by limited food availability in arid systems, as these species tend to have high-energy requirements. However, arid Australia is essentially a land of lizards, supporting among the highest diversity of reptile species worldwide – from small skinks to large, 2.5-metre monitor lizards.

Monitor lizards (*varanids*) are an incredible faunal group, comprising the largest size range within a genus of any vertebrate taxa, ranging from 20 centimetres to three metres in length. Western Australia has almost the entire size range of monitors, ranging from the Dampier Peninsula monitor (*Varanus sparnus*) at approximately 20 centimetres, to Australia's largest lizard species, the perentie (*Varanus giganteus*) at approximately 2.5 metres. In arid

Previous page

Main Black-headed monitor (*Varanus tristis*).

Photo – David Bettini

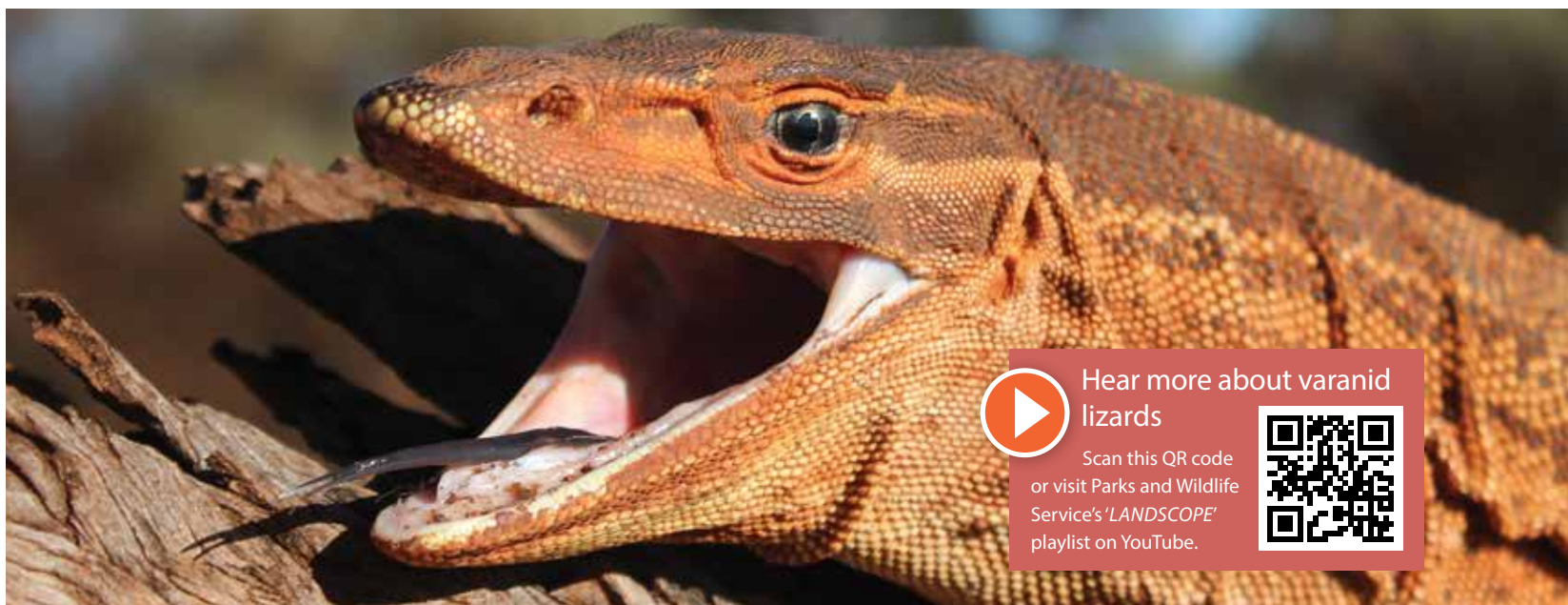
Top Little Sandy Desert lake.

Photo – Marie Lochman

Above Perentie (*Varanus giganteus*).

Photo – Judy Dunlop/DBCA

Western Australia, monitor lizards are often the apex predators, occurring at relatively high diversity. So, how is it that large, carnivorous reptiles thrive at high diversity and abundance in challenging environments?



Hear more about varanid lizards

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.



DIVERSITY IN DIET

Diet is a fundamental component of an animal's ecology, and understanding what animals eat is critical to determining how species can persist and thrive within their environment. By identifying prey that are key to an animal's diet, we may begin to understand their habitat requirements, potential resource competition between species, and how predator and prey species interact.

We assessed the diets of museum specimens of three species common in the mid-west region of Western Australia: the black-headed monitor (*Varanus tristis*), Gould's monitor (*Varanus gouldii*), and yellow-spotted monitor (*Varanus panoptes*). These species share overlapping habitats and niches across their range – the black-headed monitor is primarily an

arboreal species, living in trees, hollow logs, and crevices, and the Gould's monitor and yellow-spotted monitor are primarily ground-dwelling species, although both can sometimes be found in trees.

Animals that occupy similar habitats and niches may have similar diets, potentially resulting in resource competition.

Our study analysed stomach contents of each of the three species to determine their key prey items, and whether they rely on different prey sources to reduce resource competition.

All three species had exceptionally broad diets, and diet overlapped extensively.

Monitor lizards living in an environment where prey is seasonally active, have developed a generalist feeding strategy allowing them to adjust their diet in response to prey availability.

“Limited food availability significantly influences the species capable of surviving and persisting in arid environments.”

.....
Top left A species of Gryllidae cricket.
Photo – Jiri Lochman

Top Perentie (*Varanus giganteus*), Australia's largest monitor species.
Photo – Judy Dunlop/DBCA

Above Yellow spotted monitor (*Varanus panoptes*).
Photo – Dr Sophie Cross



Above A mating pair of perenties (*Varanus giganteus*).

Photo – Dr Sophie Cross

Above right Spiny-tailed monitor (*Varanus acanthurus*).

Below right Rosenberg's monitor (*Varanus rosenbergi*).

Photos – David Bettini

Although the monitor lizards had broad diets, the common prey items were invertebrates, particularly lizards.

AN APPETITE FOR SUCCESS

Invertebrate prey are typically abundant and are a staple in the diets of many predators living in arid zones, particularly in seasons with low rainfall. While abundant, invertebrates typically provide a lower-energy food source due to their small size, and to meet energy-requirements must be consumed in high quantities.

Vertebrate prey provide a high-energy food source, but tend to be scarce or seasonally available. Vertebrate predators need a significant energy investment to hunt and capture prey, and high metabolic

requirements associated with capture of prey in hot, arid conditions can be extremely costly.

Large predators requiring high-energy intake may be unable to rely solely upon invertebrate prey to survive arid environments. This study rarely recorded vertebrate prey items in the diet of the three species assessed, and where present, vertebrate prey primarily consisted of small reptilian species or scavenged mammalian carrion. Monitor lizards are well-adapted to arid environments, and can aestivate (spend periods of time dormant and in a state of torpor in summer), and survive on relatively infrequent feeds and low-energy food items.

The success of the monitor lizards in Australia is likely driven by their ability to feed on invertebrate prey items, and aestivate when environmental conditions exceed their tolerance levels. Assessing the diet of species is crucial to understanding how animals can persist in challenging and harsh environments.

WHERE CAN I SEE A MONITOR LIZARD?

Monitor lizards are found throughout Australia, from arid regions to tropical



areas. In Western Australia, common species such as Rosenberg's monitors (*Varanus rosenbergi*), black-headed monitors, and Gould's monitors can be found in bushland surrounding Perth, and throughout much of Western Australia. Other species, such as the yellow spotted monitor, and Australia's largest species, the perentie, require taking a trip further north to the Goldfields, Midwest, Pilbara or Kimberley regions.



Dr Sophie Cross is a behavioural and restoration ecologist at Curtin University. She has a passion for all things reptilian, and is an avid wildlife photographer. She currently works as research associate at Curtin University, in the ARC Centre for Mine Site Restoration and Curtin University Behavioural Ecology Lab. She can be contacted at sophie.cross@curtin.edu.au

LANDSCOPE

Enjoying this issue?

Subscribe, renew or give a gift subscription to LANDSCOPE

Receive four issues of *LANDSCOPE* – WA's parks, wildlife and conservation magazine – delivered directly to your letterbox. By subscribing you will also automatically receive:

- 15% discount on all WA Naturally products* when purchased through *LANDSCOPE* magazine or online at shop.dbca.wa.gov.au.
- Subscriber-only specials throughout the year.

*Subject to availability



Give a gift subscription

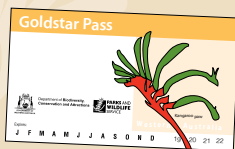


Share fascinating stories, interesting features and stunning photos of Western Australia with friends and family.

LANDSCOPE Goldstar Pass

Purchase an Annual Goldstar subscription and save!

Combine an Annual All Parks pass with an annual subscription to *LANDSCOPE*, giving you unlimited entry into any park for a year.



Purchase online at shop.dbca.wa.gov.au

WA Naturally Publications

Email customer.service@dbca.wa.gov.au

In person 17 Dick Perry Avenue, Kensington WA 6151

Phone (08) 9219 9000 Fax (08) 9219 9299

Free post with payment in a sealed envelope to:

Reply Paid 25, Locked Bag 29, Bentley DC WA 6983

   @waparkswildlife



Department of Biodiversity,
Conservation and Attractions

LANDSCOPE subscription form

Yes, I would like to subscribe to LANDSCOPE

- ☐ Annual *LANDSCOPE* subscription (four issues) within Australia – \$33 (free postage)
- ☐ Annual Goldstar subscription (combines unlimited entry to all WA national parks with four issues of *LANDSCOPE*) – \$150 per vehicle (up to 12 legally seated people)

Yes, I would like to give a gift subscription to LANDSCOPE



- ☐ Annual *LANDSCOPE* subscription (four issues) within Australia – \$33 (free postage)**
- ☐ Annual Goldstar subscription (combines unlimited entry to all WA national parks with four issues of *LANDSCOPE*) – \$150 per vehicle (up to 12 legally seated people)

Gift recipients details

Name: _____

Address: _____

P/C _____

Message: _____

Vehicle registration details (Goldstar Pass)

Date pass to commence

____ / ____ / ____

**Prices include GST. Outside Australia add \$26 per subscription

Your details

Name: _____

Address: _____

P/C _____

Vehicle registration details (Goldstar Pass)

Date pass to commence

____ / ____ / ____

Payment section

- ☐ Payment enclosed: cheque/money order made payable to 'Department of Biodiversity, Conservation and Attractions'.

☐ Visa ☐ Mastercard

Card number

____ _

Expiry date: ____ / ____ Amount: \$ ____

Signature: _____

Name (as it appears on card): _____

ORDER FORM

I would like to purchase the following
WA Naturally publications



DESCRIPTION	QTY	SUBSCRIBER'S PRICE	RRP
Rottnest Island collection includes: Rottnest Island Kingdom of the Quokka, Plants of Rottnest Island Bush Book, Common Marine Life of Rottnest Island Bush Book			\$49.95
Rottnest Island Kingdom of the Quokka (hard cover)			\$44.95
On a Wing and a Prayer		\$21.20	\$24.95
Bush Books:			
• Plants of Rottnest Island		\$5.90	\$6.95
• Common Marine Life of Rottnest Island		\$5.90	\$6.95
• Common Birds of the South-West Forest		\$5.90	\$6.95
• Waterbirds of South-West Wetlands		\$5.90	\$6.95
• Hazardous Animals of North-Western Australia		\$5.90	\$6.95
• Mammals of North Western Australia		\$5.90	\$6.95
• Mammals of the South-West		\$5.90	\$6.95
SHIPPING AND HANDLING CHARGES - ADD 1-6 Bush Books...\$4.00 Large format with/without Bush Books...\$12.50	PRODUCT TOTAL	\$	
	Shipping and handling	\$	
	International orders add \$20.50 per address	\$	
	ORDER TOTAL	\$	

Your details

Name: _____

Address: _____

_____ P/C _____

Email address: _____

Daytime contact number: _____

Payment section

☐ Payment enclosed: please make cheques/money orders payable to 'Department of Biodiversity, Conservation and Attractions'.

☐ Visa ☐ Mastercard

Card number

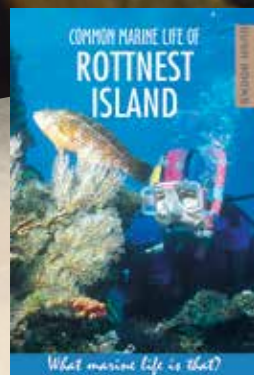
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

Expiry date: ____ / ____ Amount: \$ _____

Signature: _____

Name (as it appears on card): _____

Explore Rottnest Island with the Rottnest Island Collection



NEW RELEASE

RRP \$49.95

*limited stock available
(postage additional)

Titles in the collection include:

- Rottnest Island Kingdom of the Quokka
- Plants of Rottnest Island Bush Book
- Common Marine Life of Rottnest Island Bush Book

Purchase online at shop.dbca.wa.gov.au

WA Naturally Publications

Email customer.service@dbca.wa.gov.au

In person 17 Dick Perry Avenue, Kensington WA 6151

Phone (08) 9219 9000 Fax (08) 9219 9299

Free post with payment in a sealed envelope to:
Reply Paid 25, Locked Bag 29, Bentley DC WA 6983

Recommended retail prices shown.



@waparkswildlife



Department of Biodiversity,
Conservation and Attractions

A hare in a tortoise race

A growing community of people is attempting to complete Western Australia's long-distance trails in record time. Is it possible to enjoy and appreciate nature while you're pushing yourself to your physical limits and going as fast as you can?

by Lauren Cabrera



Western Australia's long-distance trails facilitate a certain level of escapism, since the time it takes to complete the length of the trail means time away from our fast-paced lives and an opportunity to appreciate nature.

For some, those hundreds of kilometres through varying terrain represent a challenge; the ultimate test of physical endurance to complete an end-to-end in record time. It is a polarising mindset that is certainly not for everyone.

While designed to be enjoyed at a leisurely pace, there is increasing interest from serious athletes taking on the challenge of completing the 1000-kilometre Munda Biddi Trail and Bibbulmun Track as well as the 125-kilometre Cape to Cape Track in record time.

Embarking on an end-to-end journey is inherently risky with limited access to food, shelter, water and first aid. With increased pace, comes increased risk and added pressure on support crews and potential rescuers. Travellers who push their limits can encounter fatigue, injury, disorientation and even delirium.

Planning and preparation are key, as well as good physical health, well maintained equipment and good old-fashioned tenacity.

PICKING UP THE PACE

Each year, thousands of cyclists from all over the world attempt to complete the Munda Biddi Trail between Perth and Albany. Cyclists typically take an average of three to four weeks to complete the trail and carry enough clothing, food, and camping and first aid equipment to last them a few days before taking advantage of 'trail towns' along their journey to stock up on supplies, have a meal or even stay in accommodation for a shower and a good night's rest before continuing.

Munda Biddi means 'path through the forest' in the local Menang language and the trail includes steep climbs, rocky tracks, deep sand and slippery pea gravel.

In May 2017, Declan von Dietze set the record for the fastest end-to-end, completing the trail in four days, six



Previous page

Main Cape to Cape Track.

Photo – Tourism WA

Main below On the Munda Biddi Trail.

Photo – DBCA

Above Bibbulmun Track near Albany wind farm.

Photo – Mary McGeough

Right Cycling along the Munda Biddi.

Photo – DBCA



“Craig rode for 22 hours, slept for eight hours, and then rode for another 33 hours without a break, burning 28,000 calories in the process.”

hours and 39 minutes. In October 2020, 21-year-old Albany local Craig Wiggins set a new record of two days, 17 hours and 22 minutes.

In order to complete the feat, Craig rode for 22 hours, slept for eight hours, and then rode for another 33 hours without a break, burning 28,000 calories in the process.

“I like going fast, I enjoy that, and the suffering, pain and mental challenges are all part of it,” said Craig.

“I will say, however, that it made me want to come back and do it again a lot slower and camp out at the huts. That would make it a lot more enjoyable and give me a chance to take it all in.”

The majority of riders prefer to take their time, completing the trail in weeks and even months. Some complete the trails in sections over a number of years.

“Completing the Munda Biddi as fast as possible has zero appeal to me,” said



Kim Harrison, who completed an end-to-end in 2016.

“A group of us took about four weeks to complete the ride, which gave us time each day to enjoy the unique landscape, check out the various towns, pubs and scenic attractions, with a bonus rest day in a couple of towns along the way.

“It was a great ride in every respect – good for the mind, body and soul.”

The Munda Biddi Trail Foundation maintains it’s always great to see people enjoying the trail and they welcome any rider so long as they cause no harm to themselves, to others, or to the trail itself. The Foundation does not take a formal role in organising, promoting, endorsing or

certifying the rides and as such no record is ever ‘official’.

“It is great to see the Munda Biddi Trail being fully utilised in many different and exciting ways,” Munda Biddi Trail Foundation Chair Neil Brodie said.

“While risks are present for all riders, there are specific safety risks for those who choose to make their trail experience more challenging.”

WALK OR RUN

The Bibbulmun Track is Western Australia’s oldest and arguably most well-known long-distance track having been opened in 1979 as part of the State’s 150th year celebrations. The Bibbulmun Track Foundation lovingly describes the

popular track as one that ‘stretches 1000 kilometres through a wide variety of jarrah, marri, wandoo, karri and tingle forests, interspersed with sections of coastal peppermint and heathlands. It traverses some of the most beautiful and wild areas of the south-west of the State and offers facilities unrivalled on any long-distance track in Australia’.

Walkers commonly enjoy the Bibbulmun Track by completing sections at a time, while some choose to do it over a number of years, and others are happy to

Above Cosy Corner walk trail on the Bibbulmun Track.

Photo – Mary McGeough



“The Bibbulmun Track is so beautiful, we are so lucky to have it, but it throws everything at you.”

just do a day or overnight walk. End-to-end walkers take an average six to eight weeks to walk the track, staying overnight in campsites and trail towns along the way.

In 2018, ultra-marathon runner and exercise physiologist Shane Johnstone broke the end-to-end record by completing the track in 11 days, seven hours and eight minutes. The seasoned long-distance runner had a dozen-strong support crew and a number of running companions joining him for different legs of his journey, which raised \$15,000 for charity.

At the finish line, Shane said it was the hardest thing he had ever done but he was glad he could still enjoy the track while running an average of 80 kilometres a day over the 11-and-a-half-day journey.

Above Walking along Mandalay Beach that intercepts the Bibbulmun Track.

Photo – David Reid

Above right Hiking along the Cape to Cape Track to Quininup Falls.

Photo – Dom Lim

“The Bibbulmun Track is so beautiful, we are so lucky to have it, but it throws everything at you,” said Shane.

Ultra-marathons are incredibly taxing on the body, with athletes taking weeks to recover. Athletes condition their bodies and minds over months and years in the lead up to an event so they can endure the discomfort, muscle fatigue, inflammation, nausea and psychological stress over a long period.

“Trail running on the Bibbulmun Track has increased greatly in popularity,” Bibbulmun Track Foundation Executive Director, Linda Daniels said.

“However, we don’t keep official records as we don’t wish to encourage people to try and beat them because, apart from the huge physical toll and risk factors of completing the track in record time, it is logistically very difficult. Access for support crews in the northern half is particularly challenging due to disease risk areas.”

In 2004, seasoned walker Roxanne Pendreigh was looking for new adventures and a girlfriend invited her on an overnight hike on the Bibbulmun Track. After 24 hours on the track she



was hooked and spent the next six years completing the track in sections, in no particular order.

“Every long weekend and break I was out there and each section was a new adventure,” said Roxanne. “I was driven to finish it; I walked with more than 10 different people over the years and met so many characters along the way.”

“My time on the track truly transformed me, it was a physical and mental challenge and a place to restore the body and soul. It was a pretty special time.”

COASTING ALONG

The Cape to Cape Track is the shortest of WA’s long-distance trails, spanning a respectable 125 kilometres between Cape Leeuwin Lighthouse and Cape Naturaliste Lighthouse in the south-west corner of the State.

The Friends of the Cape to Cape Track say it takes the average walker between five and eight days to walk the length of the track.

“While we are very enthusiastic about people enjoying the track, there are some serious safety issues at certain points along the way for those attempting it at speed,” Friends of the Cape to Cape Track Chairman, Kevin Lange said.



The track makes use of old 4WD vehicle tracks, constructed single trails, and natural beach sections that are mostly sand. There are easy sections, which make excellent short walks, but some beach sections are long, and hard going.

Mum of two and amateur trail runner, Michelle Hooper, decided to challenge herself to run the Cape to Cape Track in the fastest known female self-supported time.

Michelle needed to run under 26 hours to complete the feat, and she did just that completing the distance in 25 hours 49 minutes and 49 seconds.

She says the Cape to Cape Track had become a go-to place to clear her head and stretch her legs, taking in the

incredible geology of the coastline among the wildflowers and vegetation.

"I really loved the section through Boranup Forest," Michelle said. "Contos Cliffs are magical to run. I was 60 kilometres in and I found myself running along the cliffs at sunset, the waves crashing below as the sky became an array of fairy floss colours, creating memories I won't ever forget."

Walking enthusiast Mary McGeough has walked some of the world's great long-distance trails and is currently working her way through the Bibbulmun Track in sections. She completed the Cape to Cape Track with friends in 2019 and jokingly referring to their journey as 'slack packing' since they only carried a day pack and slept in local accommodation along the way.

"I think everyone who sets out to complete an end-to-end is doing it to test themselves and prove something," Mary said. "I walk for the enjoyment and the pleasure of it; appreciating the beauty of the world in its own right."

THE VERDICT

Whether you enjoy going fast and pushing your limits or enjoy taking your time and soaking in the scenery, Western Australia's long-distance trails provide a challenge for whatever you're looking for.

"Some people just like to go fast and have the physical ability to do just that," Declan von Dietze said. "I've had more phone calls, texts and emails from fast bike riders looking to enjoy the Munda Biddi Trail and asking for tips than I have from people wanting to break any record."

Ultimately, it's a matter of opinion about what and how one person enjoys and appreciates spending time in nature as long as you stay safe, understand the risks and leave only footprints...or tyre tracks.

Above Enjoying the Munda Biddi.
Photo – MTBGuidebook.com

Above left Mary McGeough and friends at Canal Rocks while completing the Cape to Cape Track.
Photo – Mary McGeough

Left Declan von Dietze meets locals on his record-setting ride.
Photo – DBCA

Below Bibbulmun Track near Mount Dale.
Photo – Michael Tuffin



Lauren Cabrera is a *LANDSCOPE* editor and can be contacted at (08) 9219 9903 or lauren.cabrera@dbca.wa.gov.au

For more information about any of the trails mentioned please visit explore.parks.dbca.wa.gov.au and trails.wa.com.au

Adventure out

CHOOSE YOUR own adventure



Since the 1990s, adventure racing has taken off around the world with participants swimming, mountain biking, trail running and paddling in picturesque locations in national and regional parks. Accomplished athlete Morgan Marsh took part in the Eagle Bay Epic Adventure Race to find out if her years participating in triathlons and ironman events would hold her in good stead competing in the rugged outdoors.

by Morgan Marsh





As a tried and true Type A triathlete, it is always a bit of a challenge to step out of my comfort zone and try something different. But 2020 certainly pushed us all out of our comfort zone, so why not extend that even further? Enter - the inaugural Eagle Bay Epic Adventure Race.

With only five weeks before race day, I signed up. Given I hadn't been on my mountain bike since I completed the Cape to Cape Mountain Bike Race in 2017, nor attempted to paddle for almost two years, I wisely, albeit uncharacteristically, chose to participate in the entry level short course.

The short course consisted of a 13-kilometre mountain bike leg from the scenic Eagle Bay Brewery through the flowing trails in Dunsborough to the crystal blue waters edge of Dunn Bay, then a 1.2-kilometre ocean swim, followed by a five-kilometre paddle and finishing with an eight-kilometre trail run through the gorgeous Meelup Regional Park.

My trepidation was quickly brushed aside, along with the dust on the bike and ski, as I set about preparing for the event.

THE LOW DOWN

The origins of adventure racing are the topic of some debate. Some say adventure racing began in New Zealand in 1980 with the Alpine Ironman where competitors ran, paddled and skied their way to the finish line. Others say the Coast to Coast race that followed in 1983, which runs from the west to the east coast of New Zealand's South Island, was the true

.....
Top Swimmers enter the water at Meelup Regional Park – host location of the Eagle Bay Epic Adventure Race.

Above Paddling ski leg.

Inset from left The challenging bike course through rough tracks;
Racing is open to all ages and abilities;
Completing the beach sand run.
Photos – Focused Ninja Photography



beginning of adventure racing since it involved running, cycling and paddling elements.

Either way, these events prompted the world to take notice and adventure racing really started to take off in the 1990s.

Much like a triathlon, adventure racing is broken into stages and the vast majority of adventure races include a minimum of trail running, mountain biking and a paddling event. Each stage begins and ends with a transition area and the longer races require some level of navigation skills due to their distance and duration.

Sprint races are ideal for beginners. They generally take three to six hours and be completed as a team, with different members completing each leg of the race. At the other end of the field are expedition races that can take up to ten days of non-stop adventuring and navigating through the wilderness.

SADDLE UP

Race day dawns warm with clear skies and a slight wind. After years of triathlons starting at the crack of dawn, I struggled to process this leisurely 10:30am start time. Wait, you mean I have time to get a coffee? I have time for a real breakfast? Oh, I could get used to this!

Triathlons are very ordered and organised. On race day it became clear that perhaps adventure racing is a little more laid back. I quickly realised I may have to just relax, go with the flow, and let go of any expectations.

We all pack into the starting corral and, as the starter gun goes, everyone sprints the 300 metres to their bikes. Being



Do it yourself

There are plenty of websites that list adventure races in Western Australia and will help you find the event that's right for you.

Some examples are:

- multisportaustralia.com.au
- adventurerace.com.au
- adventurethon.com.au
- adventurejunkie.com.au

Choose your own adventure

- **Sprint races:** generally in the three to six hour range, these races are ideal for beginners while serving as good preparation and training for more experienced racers.
- **One-day adventure races:** for the majority of more seasoned racers, 12 and 24-hour races are the popular and most sought-out races each year.
- **Multi-day races:** some consider anything over 30 hours to be an 'expedition race', but two-to-three day races are more of a bridge to a true expedition race than anything else.
- **Expedition races:** four-to-ten day, non-stop wilderness race. Truly more of an expedition than a race, these events are the pinnacle of the sport.



conservative I managed to avoid a few stacks and sudden stopping as we tackled the various obstacles. The single track was fast flowing and not as technical as I feared. It was awesome.

I came into transition, grabbed the cap and goggles and headed out for the swim. I slowed to a walk as I waded in gingerly, trying to avoid the seagrass and rocks, eventually having enough depth to start swimming. The water was crystal clear and absolutely stunning. No wetsuit required, no stingers, just clear, flat beautiful ocean.

THE HOME STRETCH

After happily overtaking a few people, I made my way out of the swim. As I walked through the seagrass once again someone kindly mentioned 'I hope there are no cobblers' ... um, thanks for that! I headed to the paddle transition and was happy to see my ski was where I left it.

I have never been so appreciative of my stable ski as people were falling out of theirs left, right and centre. Luckily, I remained dry and had the benefit of a bit of wind and wave assistance to help me along the back straight back into transition.

Now onto the run. Well, 'run' might be a generous description of my activity at this point. It was more a trudge as I made

my way along the beach through the soft sand and then onto the rocks. Sprightly kids buzzed past me like little mountain goats over the slippery and unstable rocks as I carefully chose my path, desperate to keep to my goal of remaining upright and uninjured.

I made it unscathed onto the trails along the coastline of the Meelup Regional Park. The trail was phenomenal! The view across the ocean had to be appreciated even if it meant risking taking your eyes off your feet even just for a moment. After surviving the final uphill challenge, I found enough energy for a sprint finish with a huge sense of satisfaction that I had managed to achieve my goal of staying upright, happy and whole!

THE VERDICT

After years of triathlons and all manner of multi-sport combinations, it's fair to say that although adventure racing involves similar outdoor disciplines of running, swimming and cycling, there is something really special about getting to do all those things so much closer to nature.

We are so lucky in Western Australia to have such pristine national parks, regional parks and coastline not to mention the ability to participate in adventure races with such a backdrop.

It is worth acknowledging the value of these things; not to mention the fun of starting and finishing at a brewery!

Above left A 'Le mans' start with bikes laid down in long rows.

Above Running to the paddle transition.

Below Arriving at the race.
Photos – Focused Ninja Photography



Morgan Marsh is the Executive Director of DBCA's Corporate and Business Services and represented Australia in triathlon competitions internationally from 2009–2012. She can be contacted at morgan.marsh@dbca.wa.gov.au or (08) 9219 9783.



HOUTMAN ABROLHOS – A NATURAL HISTORY

The Houtman Abrolhos islands are a truly special part of the world and this read provides a deep dive into the incredible ecosystem.

Author Dr Chris Surman has lived and breathed this area for more than 35 years and his tangible passion is clear throughout the pages.

Houtman Abrolhos – A Natural History is the culmination of more than three decades' worth of journal entries and photos during Surman's research, and I have to say it's pretty spectacular.

It focuses on the unique biodiversity of the archipelago where readers can explore how the many plant and animal species co-exist within the ecosystem.

With more than 500 original photos, the stunning imagery alone makes this an epic coffee table book that readers will likely get lost in.

A warning, once you've finished the book you may develop a strong affection for seabirds like this reader did.

Read Dr Chris Surman's article *Houtman Abrolhos: a seabird haven* on page 44.

Houtman Abrolhos – A Natural History is available to purchase at halfmoonbiosciences.com. All proceeds go towards seabird conservation efforts.



THE YORK GUM CHRONICLES

Make a cuppa and settle in for an adventure with WA's most beautiful trees as you flick through the pages of *The York Gum Chronicles*.

With more than 50 years' experience as a forester across the breadth of the State, author Roger Underwood has penned down a lifetime of personal anecdotes and life experiences with native trees.

Each chapter focuses on a different species and is complemented with stunning imagery by local wildlife scientists.

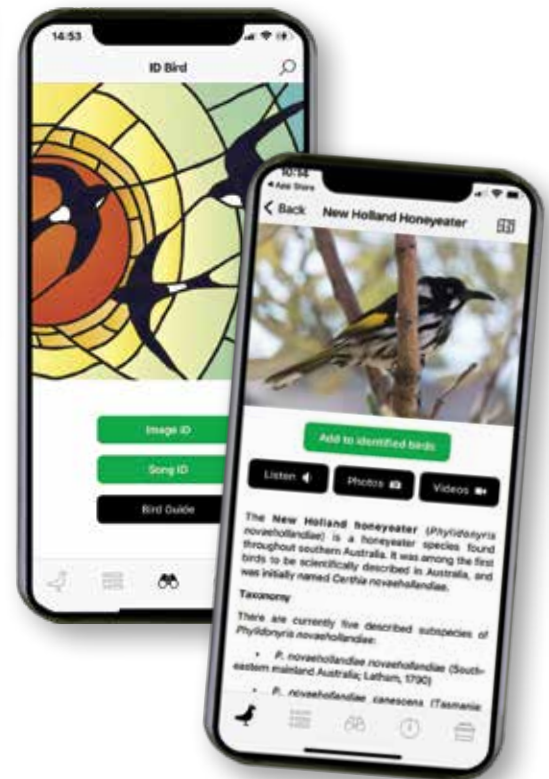
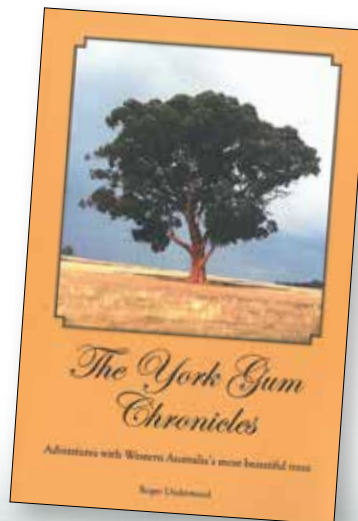
Underwood explains how each tree has a unique place in history, the different uses in Aboriginal culture, as well as some frank and honest explanations of cultivating difficult species on his property in Gwambygine.

If you have a passion for the beautiful flora of WA, this is likely to pique your interest. It's a lovely walk in the bush and down memory lane through the eyes of an expert.

While filled with facts and information, it's the personal narratives that make this a special read.

Read Roger Underwood's article *George Brockway: The forgotten conservationist* on page 24.

The York Gum Chronicles is available to purchase via email at yorkgum@westnet.com.au or at *Aspects of Kings Park* retail shop.



SMART BIRD ID

If you've ever caught yourself madly typing into Google to find out what species the mystery bird in your backyard is, then you'll want to download this app.

Smart Bird ID uses your camera or microphone to ID birds and will even provide you some interesting facts about the species.

If you're a novice, you'll enjoy the 'Nearby Birds' feature which shows you which species are likely to be spotted in your area.

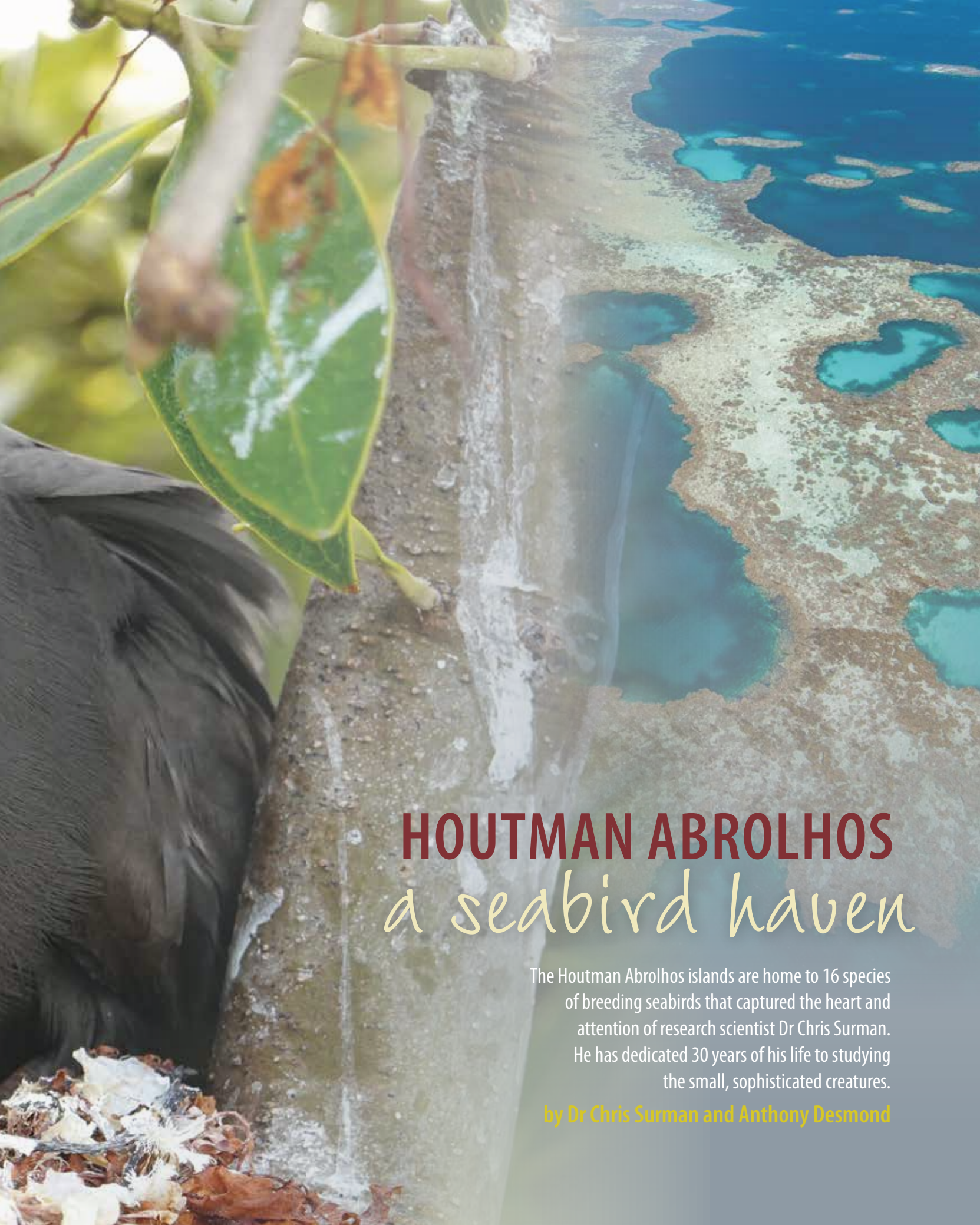
The app is free to download, but if you're a real fan of birding, it's probably worth purchasing a membership for an annual fee of \$29.99.

A membership unlocks a bunch of extra features like access to international birds, extra quizzes and the option to create your own birding profile to keep a log of your discoveries.

As someone who has only recently discovered a love for birds, this is the perfect starting point and I'll certainly be engaging in a bit of recreational citizen science in my local environment.

Smart Bird ID is available to download on the App Store and Google Play.





HOUTMAN ABROLHOS

a seabird haven

The Houtman Abrolhos islands are home to 16 species of breeding seabirds that captured the heart and attention of research scientist Dr Chris Surman. He has dedicated 30 years of his life to studying the small, sophisticated creatures.

by Dr Chris Surman and Anthony Desmond

It is 1980. Chris Surman is paddling with his friend on their tiny driftwood raft out over the indigo blue of the drop off, where they were both in awe of the ocean's depth and the fragility of their flimsy raft. It was too long before they retreated to the shallows and continued to paddle across the brightly coloured *Acropora* reefs.

Fast forward 11 years to 1991 and Chris found himself undertaking an Honours degree in Biological Sciences at Murdoch University, studying the threatened lesser noddy (*Anous tenuirostris*), a seabird species that breeds on three islands at the Houtman Abrolhos and at the Seychelles.

LEARNING CURVE

Chris is still drawn to the islands each breeding season and is still following some of the same birds he banded in 1991.

Our entire understanding of seabird demography has changed in the past 30 years and Chris is now enjoying collaborating with his childhood friend Anthony Desmond, who's a nature



conservation regional leader with DBCA's Parks and Wildlife Service, on numerous studies of albatrosses, petrels, terns and gulls.

These are sophisticated creatures, that are tied both to their breeding mates and to their nesting sites. They raise few

young but live for an extraordinarily long time, which exposes them to a lot of risks.

Back in 1991, Chris simply studied what the birds were eating. Today, through the use of tiny, 1.6-gram nano GPS trackers, we now know some species, such as the tiny lesser noddy, can forage far offshore and fly up to 130 kilometres one way while the other bird of the pair incubates the egg.

There, among a feeding frenzy of wedge-tailed shearwaters (*Ardenna pacificus*), brown noddies (*Anous stolidus*) and sooty terns (*Onychoprion fuscatus*), lesser noddies dip for translucent fish prey pushed to the surface by yellowfin and skipjack tunas, before returning at dusk to their nest site. A single return trip

My island home

The southernmost coral reef system in the Indian Ocean, the Houtman Abrolhos islands are the result of the violent action of swell, wind, currents and time. Built upon a plateau of ancient coral reefs, today's Houtman Abrolhos islands continue to evolve with the ever-increasing change in sea levels.

The Houtman Abrolhos islands, now one of Western Australia's newest national parks, are home to 16 species of breeding seabirds, including the threatened lesser noddy. Over a million pairs of seabirds breed at the Houtman Abrolhos islands on 148 of the 195 islands (76 per cent). Some, like the brown noddy, nest only at Pelsaert Island. In contrast, the bridled tern nests on at least 90 islands. It is also a stronghold for two marine raptors - the eastern osprey and the white-bellied sea eagle.



[Previous page](#)

Main A pair of threatened lesser noddies shelter their newly hatched chick.

Right Aerial of coral reef at Houtman Abrolhos Islands National Park.

Above Pairs of brown noddies nest on Pelsaert Island, among clay pans and *Nitraria* bushes.

Left The southern tip of Pelsaert Island where nearly a million seabirds from 16 species nest.
Photos – Dr Chris Surman



may cover 250 kilometres over a 16-hour period.

Chicks may be fed as much as 14 grams a day, equivalent to feeding your teenager 10 kilograms of food a day. To find their larval fish prey, lesser noddy adults commute 35 kilometres offshore to reach the feeding grounds when raising chicks. However, when incubating an egg, they may extend their foraging range to at least 250 kilometres south-west of the Houtman Abrolhos islands and spend 15 hours searching for food.

Top The largest populations of wedge-tailed shearwaters in the Indian Ocean nest and dive for fish at the Houtman Abrolhos.

Above A crested tern (*Thalasseus bergii*) returns to the colony with a beak full of slender sprat.

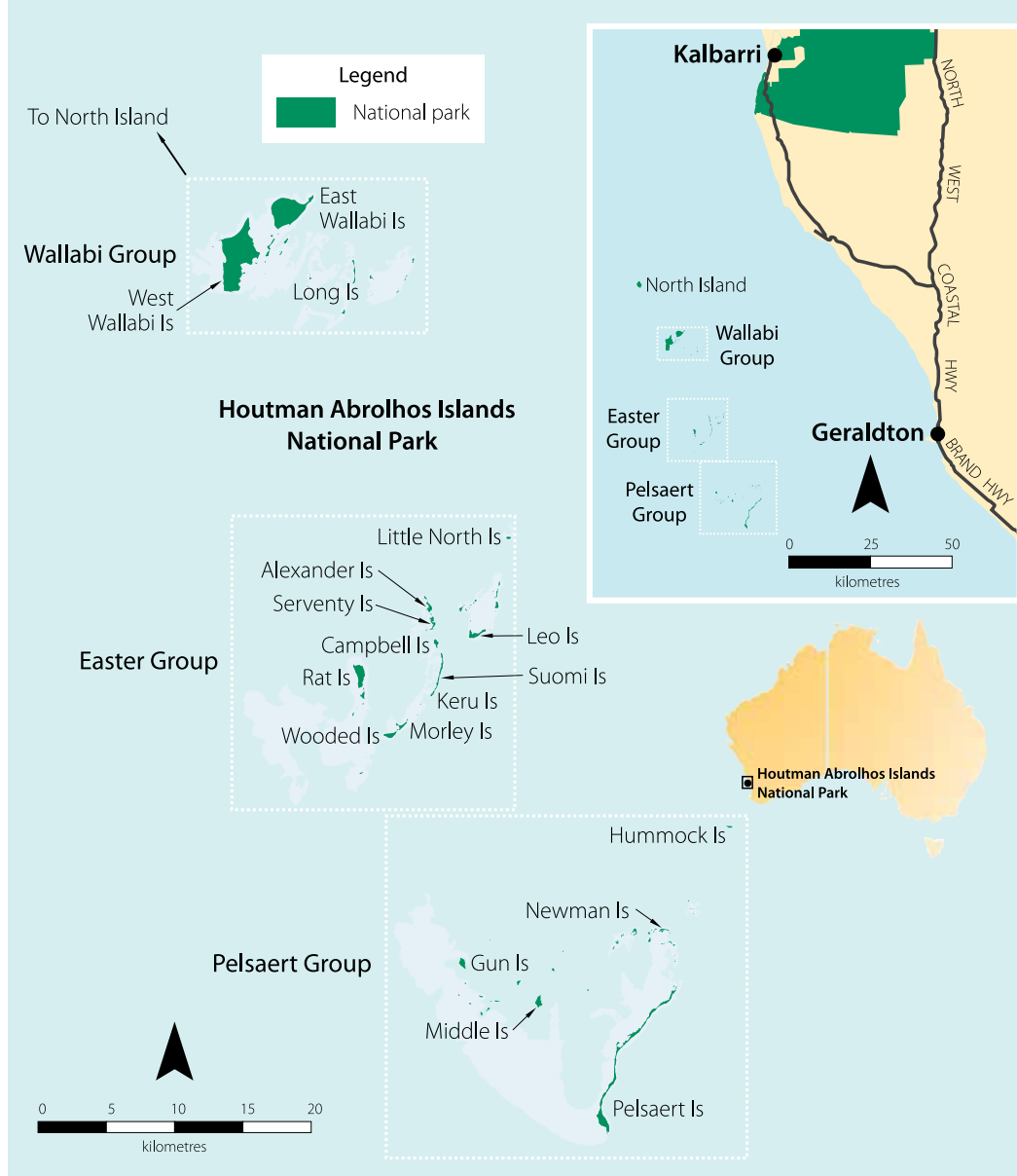
Right Two volunteers deploying trackers on a sooty tern on Pelsaert Island.

Photos – Dr Chris Surman



Listen to more about this seabird study

Scan this QR code or visit Parks and Wildlife Service's podcast.





Visiting the islands

Houtman Abrolhos Islands National Park is located 60 kilometres off the Geraldton coast and is managed by DBCA's Parks and Wildlife Service. Seabirds nest on 148 of the 195 islands, mostly during the spring/summer period. Key seabird breeding sites are Pelsaert, Wooded and Morley islands, where the threatened lesser noddy breeds. Visitors can do day trips by flying or boating to the islands with various charter operators from Geraldton. Longer five-day trips are also available from commercial operators. Dr Surman also runs a research project that often requires field volunteers for extended survey trips.

The Geraldton Museum has spectacular displays on the islands' natural and human history, and tours are available and can be booked via visitgeraldton.com.au



Our recent tracking data has also revealed the energetic demands upon breeding seabirds. To raise a single chick, each lesser noddy parent would have flown at least 2800 kilometres to and from the foraging grounds, often against 30 knot southerly winds.

SEACHANGE

Sea levels during the past Holocene period created the perfect breeding grounds close to incredibly rich foraging fields. Seabirds at the Houtman Abrolhos Islands have since adapted to and modified this iconic haven. They have also changed the landscape.

Seabirds subsidise nutrient inputs into the terrestrial and adjacent coral reef

systems by depositing nitrogen-rich guano (bird droppings) full of fishy nutrients sourced far out at sea. This extra nitrogen favours some vegetation types over others, and run-off from seabird rookeries, especially those in the mangroves, then filters into the corals themselves and is thought to contribute to coral nitrogen requirements.

Wedge-tailed shearwaters excavate their massive two-metre long burrows each season, kicking out tonnes of sand with their powerful feet, mixing this with their guano and the remains of dead eggs and chicks over years of breeding, enriching the soils. As dusk falls, their eerie, mournful calls haunt the rookery, as they call to their mates and neighbours.

GO WITH THE FLOW

Each year, the seabird breeding schedule shifts because of events that have occurred thousands of kilometres away in the Pacific Ocean. El Niño and La Niña events change the flow of the ocean and ultimately the delivery of larval fish prey to breeding seabirds.

During the strong El Niño event of 1997, larval fishes were so far offshore the seabirds deferred breeding. Eventually

Above A colour-banded lesser noddy incubates its egg.

Above right A bridled tern (*Onychoprion anaethetus*) at its nest among salt bushes on Beacon Island.

Left Lesser noddies nest among the branches of the white mangrove.

Photos – Dr Chris Surman



in December, breeding commenced but sadly by the time the chicks hatched, most parents were unable to provide the nestlings with enough food, and chicks died off across the colony.

In late 2020, a La Niña event occurred, resulting in one of the earliest and most productive starts to the seabird breeding season in the past 30 years. It is a delight to sit and watch lesser noddies flying into their mangrove colonies carrying long fronds of sargassum seaweeds with which to decorate their elaborate tree nests.

UNDER PRESSURE

Seabird populations around the globe are under enormous pressures; in fact one study estimated that seabird populations have declined by 70 per cent in the past 50 years. Much of this is due to human development, overfishing and plastic pollution in our oceans.

Interestingly, at the Houtman Abrolhos islands, seabird nests reflect the state of our seas with the material used in their nest building. While seabirds are not renowned for nest building, almost every species we studied decorates their nest or nest scrape (often just a bare patch of ground with a depression) with sea drift

objects that now include hard plastics, rope and pieces of fishing net.

However, we must remain problem solvers, and the data gained from research projects such as this one help guide us as custodians, to seek to lessen our anthropomorphic impacts upon this wondrous place for breeding seabirds.

The Houtman Abrolhos islands are a truly remarkable opalescent gem, perched at the edge of the continental shelf that we need to ensure remains a safe haven for these remarkable seabirds.

Top left Fledgling wedge-tailed shearwaters prepare for flight.

Top A well-camouflaged roseate tern (*Sterna dougallii*) chick.

Above Sooty terns take to the air over Pelsaert Island.

Below Dr Surman monitoring brown noddy nests at a site he established in 1991.

Photos – Dr Chris Surman



Dr Chris Surman is a marine ecologist, photographer and author.

He can be contacted at halfmoon.biosciences@westnet.com.au

Anthony Desmond is regional leader nature conservation with DBCA's Parks and Wildlife Service. He can be contacted at anthony.desmond@dbca.wa.gov.au or (08) 9964 0901

Dr Chris Surman's book Houtman Abrolhos: A natural history is available to purchase from the Halfmoon Biosciences website halfmoonbiosciences.com and is reviewed on page 43





Blooming surprise

toxic algal blooms in Perth rivers

Algal blooms in the Swan Canning Riverpark have been rapid and concentrated. Scientists have responded quickly to understand more about the algae and its potential toxicity to humans through seafood consumption.

by Dr Kerry Trayler and Dr Jeff Cosgrove





Since early February 2019, the Swan Canning Riverpark has experienced two widespread blooms of toxic dinoflagellate microalgae that seriously impacted fishing activity on the waterway. The microalgae, *Alexandrium* spp., occurred at such high concentration that the Department of Health issued advice against consuming seafood from affected areas over summer/autumn in 2019 and 2020.

The two blooms were unprecedented in scale in Western Australia and required scientists from the Department of Biodiversity, Conservation and Attractions (DBCA) to respond quickly to understand *Alexandrium*, its toxicity and potential control, to inform the management response.

LITTLE ALGAE BIG KICK

The tiny (smaller than 0.03 millimetres) dinoflagellate genus, *Alexandrium*, comprises about 31 species, and roughly half of these produce paralytic shellfish toxins (PSTs), which are harmful to humans.

PSTs can be concentrated by filter feeding shellfish (e.g. mussels, clams and oysters), crustacea (e.g. crabs and lobsters) and even marine snails. Consumption of affected seafood can result in paralytic shellfish poisoning (PSP), with symptoms ranging from a slight tingling sensation or numbness around the lips to fatal respiratory paralysis. Global estimates suggest almost 20 per cent of PSP cases are attributable to *Alexandrium* species.

Alexandrium toxicity is influenced by species, strain, geographic region and

environment conditions, as well as the biological pathway of contamination. In Australia, detection of PSTs in blue mussels arising from *Alexandrium tamarense* seriously impacted the Tasmanian East Coast rock lobster export fishery in 2012.

Toxins were detected in mussels, scallops and lobster, causing a widespread closure of recreational and commercial fisheries in the region. While there have been no recorded deaths in Australia, PSTs are routinely monitored as part of commercial fishery quality assurance programs in many states.

LOCAL BLOOM

Water quality of the Swan Canning Riverpark is monitored weekly and scientists keep a close watch on the density of harmful algae. The detection of *Alexandrium*, even at one cell/mL, is considered serious enough to report to the Department of Health.

Over the past decade, monitoring has only detected *Alexandrium* in less than 0.03 per cent of all samples (maximum 40 cells/mL in 2001) and incidents were short-lived. So, the scale and intensity of the bloom that arrived in February 2019 came as a surprise.

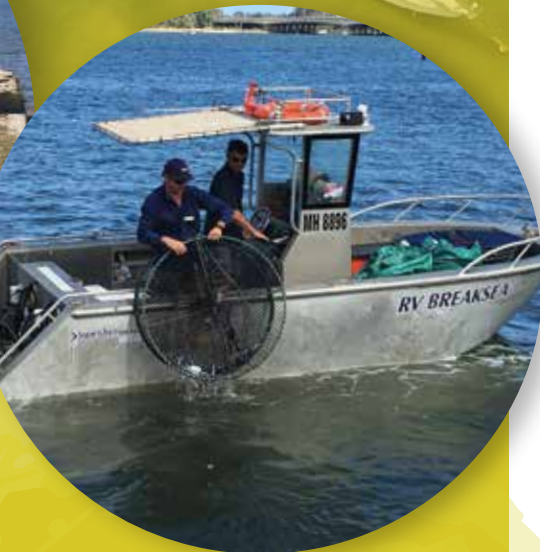
Lasting 15 weeks, a bloom of *Alexandrium minutum* affected areas between Pelican Point and Herne Hill on the Swan River and reached 9890 cells/mL at its peak. A second major bloom began in December 2019, this time impacting both the Swan and Canning rivers, reaching 15,453 cells/mL and taking 18 weeks to fully subside.

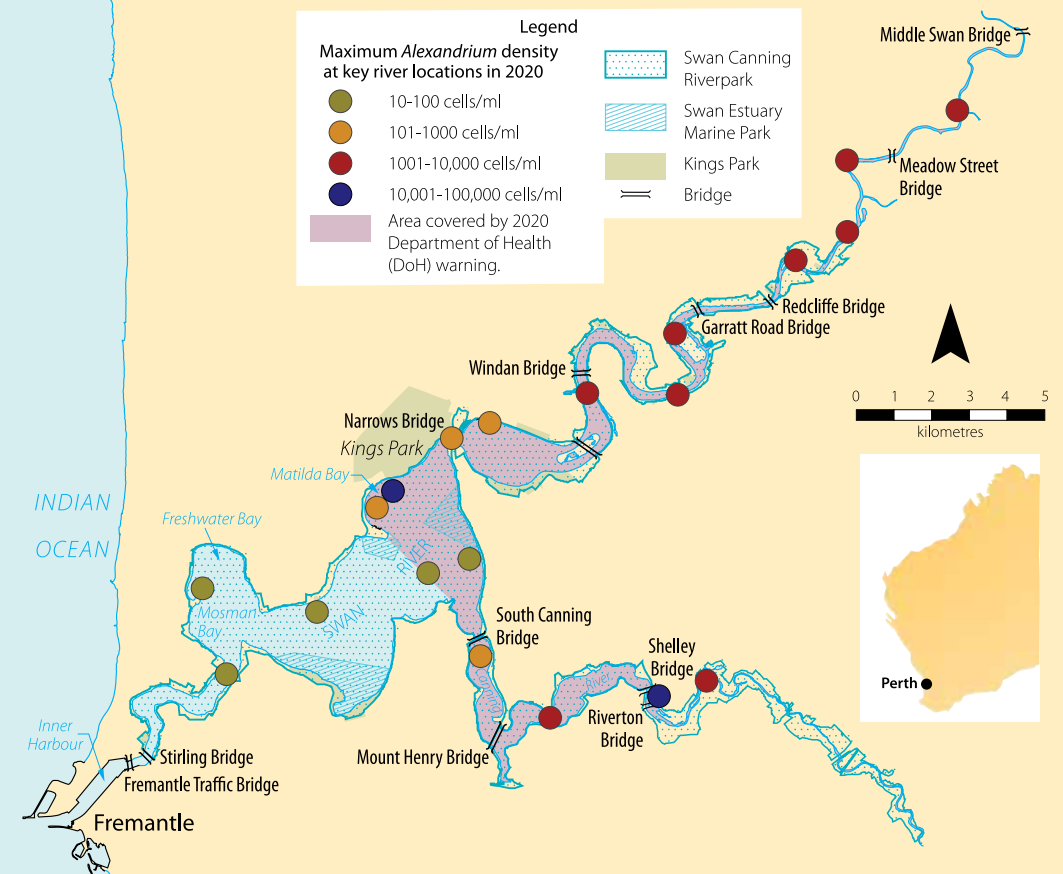
Two species of *Alexandrium* were detected during the second event, *A. minutum* and *A. pacificum* and visible,

Main Yellow plumes were observed during the peak of the bloom in 2020. As a general rule, the public should avoid swimming in areas of discoloured water.
Photo – Steve Schneider

Insets from far left Harmful algae caution signs were posted at key traffic bridges, popular fishing locations and boat ramps throughout the Swan Canning Riverpark. *Photo – Lauren Cabrera*
DBCA and DPIRD scientists worked together to collect and test crabs for potential toxins caused by the microalgae.

Inset right Water quality sampling is conducted weekly and investigated for the presence of harmful algae.
Photos – DBCA





Above Toxicity assessments were undertaken on mussels, crabs, and fish from the Riverpark.

Below The head, guts and gills of crabs collected from the river should be removed before consumption.

Photos – DBCA

yellow-coloured plumes were observed in parts of the waterway.

TOXICITY CONCERN

During each of these major bloom events, the Department of Health issued warnings advising fishers to avoid consuming seafood from affected areas. This precautionary approach was supported by evidence collected by scientists at DBCA and the Department of Primary Industries and Regional Development (DPIRD), who worked together to collate information on the concentration of toxins in mussels, crabs and fish in bloom affected zones.

Over the course of the two blooms, PSTs were detected in mussels at 11 times the safe levels for human consumption (as identified in the Australian and New Zealand Food Standards Code 2017). Toxins detected in crab viscera (guts) were twice the prescribed guideline levels. Only trace level PSTs were detected in crab flesh and no toxins were detected in fish flesh.

CONTROL OPTIONS

Algal dynamics respond to ambient environmental conditions and the two

Alexandrium blooms are believed to be associated with favourable temperatures, salinities, and available nutrients in the riverpark, as well as the relatively calm conditions that prevailed.

Although catchment initiatives are in place to reduce nutrients entering the waterway, it is predicted that *Alexandrium* will return regularly over future summer and autumn periods. These algae form cysts as a strategy to survive unsuitable conditions and it is anticipated that these may provide a 'riverbed seed bank' for subsequent blooms.

Given the likelihood of successive bloom events, DBCA scientists undertook a trial of locally available clays for their potential to remove *Alexandrium* from solution. Bentonite clay had shown some

potential for control of other dinoflagellate algae, but in this case did not prove to be a suitable control option. Other approaches are being considered as part of a multi-agency collaboration with research institutions.

FISHER BEWARE

As the next algal bloom season is upon us, scientists are keeping a cautious watch on algal densities. Fishers are advised not to eat wild-caught shellfish from the Swan and Canning rivers and, as a general rule, recreational crabbers should remove the head, guts (mustard) and gills from crabs before freezing, cooking or eating in order to reduce their risk of ingesting PSTs. Harmful algae caution signs have been posted at key locations.



Dr Kerry Trayler is a Rivers and Estuaries Science program leader with DBCA's Biodiversity and Conservation Science and can be contacted at kerry.trayler@dbca.wa.gov.au

Dr Jeff Cosgrove is an environmental officer with DBCA's Biodiversity and Conservation Science and can be contacted at jeff.cosgrove@dbca.wa.gov.au

Bilby: Unique creature, extraordinary features

The greater bilby (*Macrotis lagotis*) is the only living bilby left in the world and there are only a small number left in the wild. Not many people know about these adorable marsupials so this Easter, help raise awareness for our local species and **celebrate the Easter Bilby instead of the Easter Bunny!**

Bilbies are unique creatures with extraordinary features. Look closely at their special characteristics. Can you see their sharp claws for digging, or spot their large ears which help to keep them cool in the heat, and did you notice the white tip on the end of their long tail?

Right Greater bilby (*Macrotis lagotis*).
Photo – Jiri Lochman



Make your own bilby

Using your knowledge on bilby features and looking at some pictures, create your own bilby from materials you find around the house. You could use leaves, sticks, clay, blocks or even recycled materials like this adorable bilby bottle planter (pictured). Take a photo of your cute bilbies and send them to @NearerToNature on Facebook.

Left Bilby craft activity.
Photo – Naomi Adamczyk



Missing words

Can you fill in the missing letters on these bilby related words?
(answers at the bottom of the page)

- 1 B__ B__
- 2 MAR__ U__ I__ A__
- 3 __S__ RA__ IA__ A__ __MA__
- 4 V__ LN__ RA__ LE

Bilby facts

Just like kangaroos (which are also marsupials), female bilbies have a pouch where their baby joeys are raised.

Hiding away in burrows during the day, these nocturnal hunters come out at night to search for insects, plant roots and fungi.

The greater bilby is a vulnerable species because it has many predators and competes for habitat with introduced animals such as the fox and rabbit.

The bilby was previously found all across Australia, but now can only be found in northern Western Australia, some of the Northern Territory and a very small population still remains in western Queensland.



Above Bilby burrow and tracks.
Photo – Judy Dunlop/DBCA
Left Bilby.
Illustration – Gooitzen van der Meer

Answers for fill in the missing letters: 1. Bilby; 2. Marsupial; 3. Australian Animal; 4. Vulnerable.



Splendid fairy-wren (*Malurus splendens*)

The splendid fairy-wren (*Malurus splendens*) is a striking animal, easily identifiable by the male wren's blue breeding plumage with bands of black across the base of the tail, breast, beak, through the eyes and across the back of its neck. Females are mostly brown with light blue tail feathers, with a reddish line from their eye to their beak. They eat mostly insects and forage on the ground of shrublands and shrubby woodlands in arid and semi-arid parts of Australia.

Illustration by Gooitzen van der Meer

Reference photo by Sallyanne Cousans

Discover Western Australia's remarkable wildlife

Western Australia is home to a diverse variety of animals, and *WA Naturally* has a range of books and pocket-sized guides to help you learn all about them, including *On a Wing and a Prayer*, which follows a family of Carnaby's cockatoos.

RRP \$24.95 each

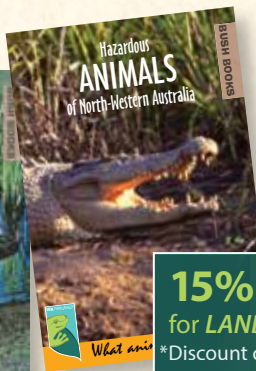
15% DISCOUNT LANDSCOPE subscriber price:
for LANDSCOPE subscribers
*Discount code: LANDSCOPE-SUB-BB

\$21.20 each



Bush Books

Bush Books are a wonderful series of practical, pocket-sized field guides to help you learn about and discover WA's unique plants, animals and special features, region by region.



RRP \$6.95 each

15% DISCOUNT LANDSCOPE subscriber price:
for LANDSCOPE subscribers
*Discount code: LANDSCOPE-SUB-BB

\$5.90 each

*Apply discount code at checkout for online purchases

Purchase online at shop.dbca.wa.gov.au and from good bookshops, newsagents and visitor centres.

WA Naturally Publications

Email customer.service@dbca.wa.gov.au

Phone (08) 9219 9000 Fax (08) 9219 9299

Free post Post with payment in a sealed envelope to:
Reply Paid 25, Locked Bag 29, Bentley DC WA 6983



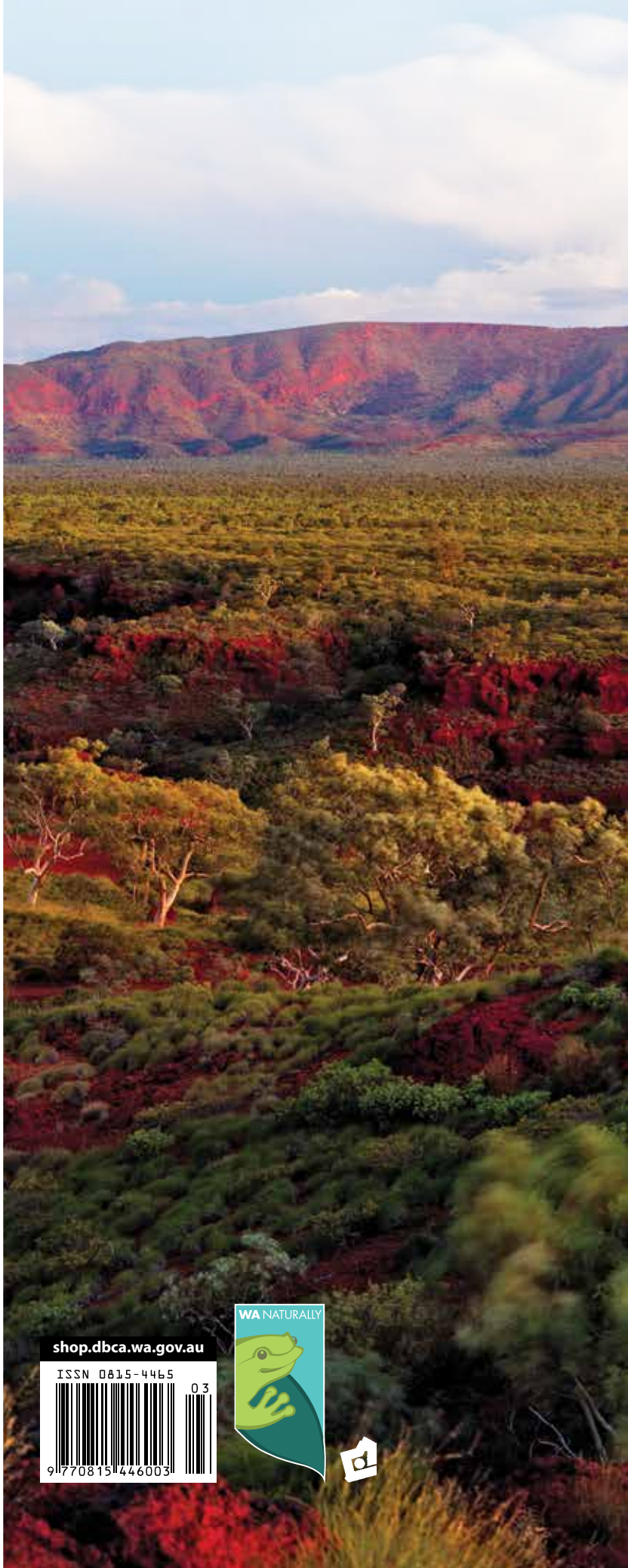
@waparkswildlife



Department of Biodiversity,
Conservation and Attractions



2020_719



shop.dbca.wa.gov.au

ISSN 0815-4465

03



9 770815 446003

