

**NEW LOOK**  
NEW FEATURES

WA'S PARKS, WILDLIFE AND CONSERVATION MAGAZINE

# LANDSCOPE

Volume 30 Number 2 Summer 2014-15 \$7.95

## LEEUVIN-NATURALISTE CAPES Our south-west playground

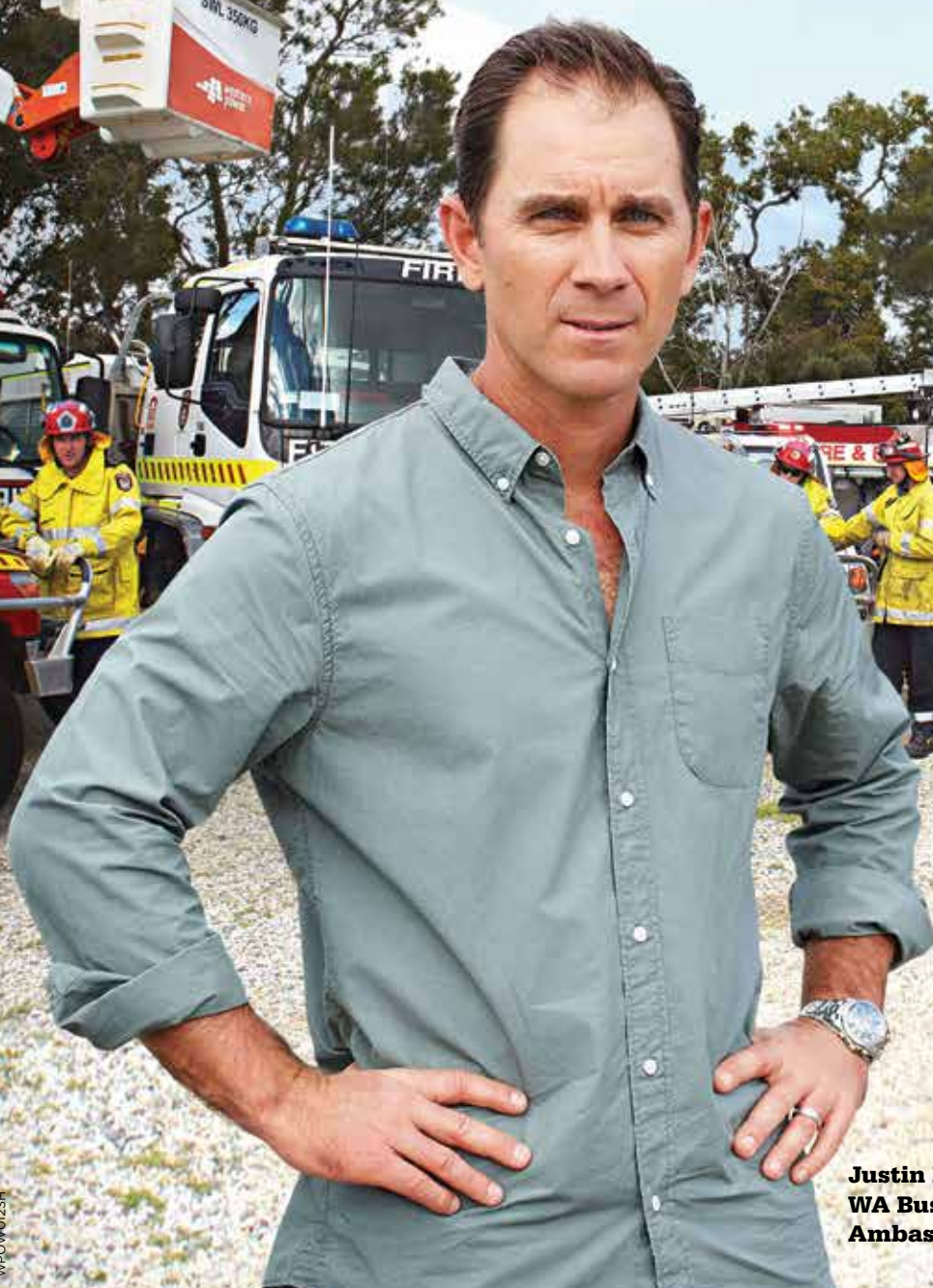
### Tracking eagles

Secret lives of  
'wedgies'

### New beginnings

WA chuditch  
head east

# ARE YOU BUSHFIRE READY?



**Our firefighters, Western Power and Parks and Wildlife officers are doing everything they can to protect us. But this is a team effort and we all need to play our part. Find out what you should be doing to prepare at: [areyouready.wa.gov.au](http://areyouready.wa.gov.au)**

**Justin Langer  
WA Bushfire Ready  
Ambassador**





**ON THE COVER**

**Front cover** The lookout to the magnificent Sugarloaf Rock near Cape Naturaliste in Leeuwin-Naturaliste National Park can be accessed by people of all abilities thanks to the 'Access for More' track which caters for people in wheelchairs as well as parents pushing prams (see 'Our south-west escape: the Leeuwin-Naturaliste capes' on page 28).  
*Photo – Luke Tscharke*

**Back cover** Australian ringneck parrots (*Barnardius zonarius*) occur throughout south-west Australia.  
*Photo – Andrew McInnes*



**A**cross Western Australia Parks and Wildlife manages a land area roughly the size of Victoria. These lands are diverse and spectacular, but can also be remote and challenging. Managing these areas relies on the dedication and expertise of staff who look after the visitor facilities, work to protect and conserve plants and animals and undertake fire management tasks, as well as the various behind-the-scenes operations that make this work possible. Working in regional areas often means our staff carry out a multitude of roles.

For example, virtually all regionally based staff are involved in fire management tasks, even our marine parks staff! Our people are often the first point of contact for visitors and in many cases they live in the areas in which they work. They maintain strong partnerships with neighbours, other government departments, volunteers, partners, individuals and organisations.

WA's regions have long been the backbone of the State's economy. In 'Home of the Holland Track and numbats' on page 16, you can read about John Holland who cut the Holland Track in 1893. This back-breaking work provided an alternate route to the Goldfields for those in search of gold. Our regional areas also play an important role in tourism. The Leeuwin-Naturaliste capes area (see 'Our south-west escape: the Leeuwin-Naturaliste capes' on page 28) is well-known and loved by locals and visitors from near and far.

In this edition we also feature a major success story for the chuditch, which has recovered to such an extent that Western Australian animals are being used to pioneer new populations in South Australia (see 'Postcards to home' on page 37). In 'Heat in the peat' on page 51, we are given a fascinating insight into fire suppression on a totally different landscape.

Managing our vast and diverse conservation estate presents many unique challenges, but they are challenges we constantly meet with support from partners and the community.

**Peter Dans, Director Regional and Fire Management Services**  
Department of Parks and Wildlife



**Jeremy Thomas** entered the horticultural industry as a Kings Park student in the mid-1980s, eventually directing his studies into arboriculture specialising in urban tree care and transplanting, which has

taken him around Australia and abroad. Jeremy successfully applied for the Botanic Gardens and Parks Authority arborist position in 2005 and was awarded a Winston Churchill Fellowship in 2008 to travel overseas and research general tree care and risk management practices.

**Contributing**

**Joanna Moore** started her career in 2006 in the then Department of Conservation and Land Management's graduate program.

A range of roles in the following seven years saw her grow her love for WA's natural landscapes, and a pleasure in sharing that interest with others, such as through contributing to *LANDSCOPE* magazine and many other departmental publications. Joanna's passion for the written word is now the focus of her freelance editing and writing activities.



**John Gillard** is the Parks and Wildlife Donnelly District manager based in Pemberton. He has been a district manager for 24 years, and has 37 years' experience in a range of fire management roles including sector commander and incident controller. This has seen him involved in planning and managing for fire preparedness, prescribed burning and bushfire suppression work in a range of vegetation types across the south-west of WA.



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**This page** Enjoying the view at Lake Clifton, Yalgorup National Park.

Photo – Andrew McInnes



Department of  
Parks and Wildlife



**PARKS  
AND  
PEOPLE**

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## Citizen science key to quenda survival in the suburbs



'Citizen scientists' have contributed valuable information about the occurrence of quenda (*Isoodon obesulus fusciventer*) in Perth and the south-west. The project, known as the Spring Quenda Count, is part of an on-going Quenda Survey run by Parks and Wildlife and WWF-Australia to chart changes in the distribution and population of the priority-listed species.

Almost 1000 'citizen scientists' reported quenda sightings in the first year of the survey project, demonstrating a great level of public interest in this charismatic marsupial. Now in its third year, the project has mapped the distribution of quenda at 1020 sites across the Perth, Peel and South West regions.

Remarkably, quenda can still be found in remnant bushland across suburban Perth. Comparison with a 1993 community quenda survey carried out by the then Department of Conservation and Land Management has shown that quendas have declined in some parts of Perth where urbanisation has occurred, but have increased in other areas, particularly in the Perth hills, where they appear to have benefited from contact with humans who provide irrigated lawns, food scraps and structures they can hide in. They may also have been helped by *Western Shield* fox baiting in nearby reserves. It may be some time before the full effects of urbanisation on quenda are known, though it is evident they are under threat from habitat loss, vehicle strikes, predation from cats, dogs and foxes, drowning in swimming pools and garden ponds, and poisoning from snail and rat baits.

The Quenda Survey is one of many projects coordinated by Parks and Wildlife and partner organisations that benefit from the participation of citizen scientist volunteers. Some past and ongoing examples include graceful sun moth surveys, the Banksia Atlas project, the Adopt an Orchid program, the development of a BirdLife Australia Atlas, and the annual Great Cocky Count with BirdLife Australia.

For more information on the Quenda Survey visit [www.wwf.org.au/quenda](http://www.wwf.org.au/quenda), or to get involved contact Parks and Wildlife Swan Region ecologist Geoff Barrett at [geoff.barrett@dpaw.wa.gov.au](mailto:geoff.barrett@dpaw.wa.gov.au).

Above Quenda (*Isoodon obesulus fusciventer*).  
Photo – Simon Cherriman

### Snap shot

#### READERS' PIC

##### Nornalup Inlet

Cameron Griffiths



"Here is an incredible image of nature and my son, Jesse. The morning started out a little cool, but warmed up nicely for an August winter day. It was a beautiful day at Nornalup Inlet with singing birds in the colourful trees. Although the inlet water was calm, we knew the fish were plentiful. The only kayak around was ours so it was just my son, me and nature. The serenity was lovely and it was all nature at its best."

Have you got a fantastic 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@dpaw.wa.gov.au](mailto:landscape@dpaw.wa.gov.au).

## Ten-year plan for tall tuarts

The Swan Coastal Plain's tallest trees will be protected under a plan to manage and conserve Tuart Forest National Park, 15km north-west of Busselton in WA's south-west.

The national park is home to the largest remaining area of tuart trees in the world, which, at up to 42m tall, are the tallest trees on the Swan Coastal Plain.

The 10-year *Tuart Forest National Park management plan*, released in August 2014, sets out strategies to protect and enhance the area's natural and cultural values, provide visitor experiences, and reduce the impact of weeds, inappropriate fire regimes, introduced animals and threats to tuart health from insects and pathogens.

The park provides important habitat for several threatened animal species, including the western ringtail possum (*Pseudocheirus occidentalis*). It also contains almost 600 species of native plants, including the endangered Vasse featherflower (*Verticordia plumosa* var. *vassensis*), as well as 24 priority-listed species.

Many tuart woodlands on the Swan Coastal Plain have been cleared for agriculture or urban development, highlighting the importance of the national park to protect the trees for future generations to enjoy.

The park is also valued for its significance to Noongar people, with the area containing a number of mythological and heritage sites, as well as its historical significance as a centre of the early timber industry in WA. Visitors to the area can enjoy bushwalking, picnicking and appreciating nature.

To view the final management plan visit [www.dpaw.wa.gov.au](http://www.dpaw.wa.gov.au).



A greater level of cooperation and understanding between the State Government and traditional owners will help to protect the remarkable Eighty Mile Beach Marine Park in the Kimberley.

Two Indigenous Land Use Agreements were signed by the Government in 2014 for the marine park and neighbouring land reserves – the first with the Nyangumarta people, native title holders of the central part of the marine park, and the second with the Ngarla people, native title holders of the southern end.

The agreements formalise joint management arrangements between the Nyangumarta and Ngarla people and Parks and Wildlife. They include the establishment of joint management bodies, the creation of conservation reserves within Nyangumarta and Ngarla country, opportunities for employment of Nyangumarta and Ngarla rangers in the day-to-day management of the parks, and additional funding for joint management activities.

Created in January 2013, Eighty Mile Beach Marine Park extends over almost 210,000ha from about 30km west of Cape Keraudren in the south to 10km south of Cape Missiessy in the north-east. For the first time in WA, special purpose zones were included in the park's zoning scheme to recognise sites of significant Aboriginal cultural heritage.

The marine park is a valuable site for wildlife, including turtles, dugongs and sawfish, and is one of the world's most important feeding grounds for migratory shorebirds and waders with one section of the park listed under the Ramsar Convention. More than 400,000 shorebirds feed at Eighty Mile Beach after travelling from their breeding grounds in the northern hemisphere. The park also supports a significant nesting population of flatback turtles, which are endemic to northern Australia.

The cooperative work to protect Eighty Mile Beach is part of the State Government's *Kimberley Science and Conservation Strategy* (see also 'Protecting the nature of the Kimberley' on page 22). Negotiations are underway for two more Indigenous Land Use Agreements with native title holders in the area.

**Top** Traditional owner Margaret Rose looking out over the waters of Nyangumarta country at Eighty Mile Beach.

Photo – Chris Nutt/Parks and Wildlife

## CORRECTION AND APOLOGY

The illustration of a numbat that appeared on page 54 of the Spring edition of *LANDSCOPE* (volume 30, number 1) was wholly based on an original photograph by Sharon Wormleaton.

*LANDSCOPE* magazine sincerely apologises to the photograph's author for misrepresenting her original work and reproducing it without permission. – Editor

## Justin Langer AM



*'Are You Ready?'  
WA Bushfire Ready  
Ambassador, Western  
Australia cricket  
coach, former  
Australian test  
cricketer*

West Australians are no strangers to bushfire. We know it's a natural part of our landscape, yet it can be devastating to those who lose property and possessions, or worse. Having seen first hand the devastation of bushfire, we all need to be prepared. But, it's not just people who live in the bush or on semi-rural blocks who need to be prepared – plenty of suburban and town homes can also become threatened by fire burning in parks and reserves. Being prepared for the eventuality of fire is absolutely crucial to ensuring the best-possible outcome. And it's everybody's responsibility.

There are many things that you can do around your home and property to prepare for bushfire season. Some are as simple as cleaning out your gutters, pruning trees and clearing materials from around the house, others such as hooking up a generator and establishing an independent water supply will take a little more planning. You should also make sure you have up-to-date and adequate insurance and a bushfire survival plan, which everyone in your household knows and understands.

West Australians are familiar with coming together to help each other out. As an international cricketer, I made a career out of supporting and relying on my teammates. Away from the cricket field I've seen some solid teamwork at a community level too; interestingly, bushfires have brought out the best in people, even in the worst of times.

Our career and volunteer firefighters and Parks and Wildlife staff do an amazing job, as do the staff and volunteers from a host of other agencies and groups who assist in firefighting efforts and in the aftermath. I have incredible respect for all of these fantastic people.

What's important though is that we all have a role to play. Next time you're chatting to your neighbours ask 'Are You Ready?' And, if you can, lend a hand to friends, family and neighbours who might need assistance in preparing their property for the bushfire season ahead.

Visit <http://areyouready.wa.gov.au> to find lots of useful information and checklists to help you prepare.

**ARE YOU  
BUSHFIRE  
READY?**



## Yalgorup National Park

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*Fifty kilometres south of Mandurah, Yalgorup National Park provides panoramic views of the local beaches, forests and woodlands to explore and important habitat for a range of birds and mammals. It also gives visitors and scientists a unique glimpse of what life was like at the dawn of time.*

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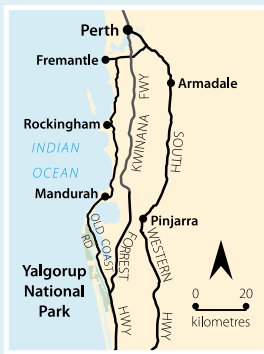
**A**t 12,888ha, Yalgorup National Park is the second largest national park on the Swan Coastal Plain. Its name is derived from the Noongar words for 'swamp' or 'lake', and 'place of'. It was first visited by Europeans in 1829. In 1930 a settlement was established in the area now known as Mandurah.

The park incorporates 10 lakes and is famed for its rock-like structures known as thrombolites, that occur on the edge of Lake Clifton in the northern part of the

park. These fascinating structures are built by microorganisms that, while too small for the human eye to see, form diverse communities. Similar structures built by ancient microbes (fossil 'microbialites') are considered some of the oldest evidence of life on Earth, from about 3500 million years ago. The modern living forms and the ancient fossils are helping scientists examine how life began on the planet. Living microbialites are globally quite rare, but Western Australia has a mind-

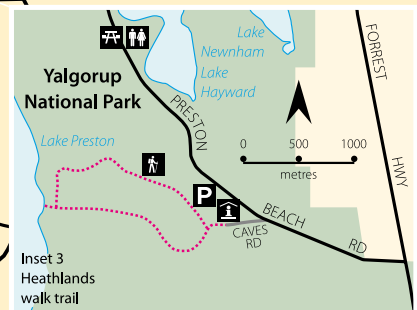
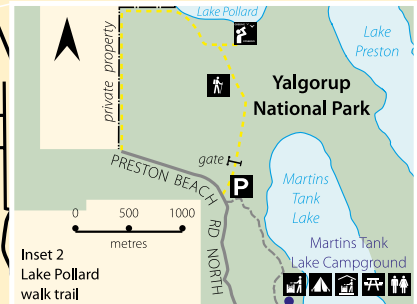
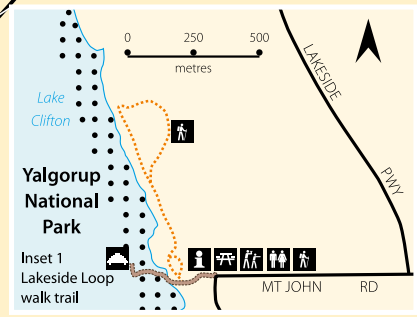
boggling array of them, including at Yalgorup National Park where upwellings of fresh groundwater that is high in calcium carbonate occur.

Visitors can discover this amazing phenomenon, while minimising damage to the area, via an observation walkway. There is also a Grade 2, 5km walk trail around Lake Clifton which guides visitors past the stands of *Melaleuca*, peppermint and tuart trees and past some fencing and a cattle ramp – throwbacks to the area's farming



**Legend**

- National park
- Thrombolites
- Highway
- Sealed road
- Unsealed road
- Heathlands walk trail
- Lakeside Loop walk trail
- Lake Pollard walk trail
- Barbecue (gas)
- Birdwatching
- Boardwalk
- Boat launching
- Camping
- Camp kitchen
- Caravan park
- Car park
- Drinking water
- Food
- Fuel
- Information
- Information shelter
- Picnic area
- Scenic vistas
- Toilets
- Walk trail



*Opposite page*  
**Left** Thrombolites at Lake Clifton.  
*Photo – Tourism WA*

**Far left** Facilities at Martins Tank Lake Campground.  
*Photo – Alicia Dyson*

**Left** Campgrounds at the upgraded facilities.  
*Photo – Parks and Wildlife*

days in the 1900s. There are two other walk trails in the park – the 4.5km Heathlands walk trail near Lake Preston and the Lake Pollard walk trail, a 6km journey which ends at Martins Tank Lake Campground.

## STAY A WHILE

Martins Tank Lake Campground has been the subject of a recent \$1.3 million upgrade as part of the \$21.05 million *Parks for People* initiative, which provides a range of affordable camping and caravan options

to ensure people have access to enjoy and experience WA's natural and iconic areas. The upgrade includes eight new tent camp sites, four larger group camp sites, a camp kitchen, two communal fire pits and two toilets. It also provides for caravans and camper trailers and has doubled the number of camp sites to 34.

## LOCAL RESIDENTS

Martins Tank Lake, named after a local pioneering family, is one of 10 lakes in the

park. These lakes are part of the Peel-Yalgorup wetlands system, a wetland of international importance, as it supports many local and international waterbirds such as the rare hooded plover, which nest and rear their young on the park's shores. The migratory waterbirds visit lakes Clifton, Pollard and Preston in spring and summer to escape the cold northern hemisphere winter. A bird hide at Lake Pollard gives visitors views across the lake where they might see black swans, red-necked stints, black winged



**Top** Southern diplolana (*Diplolaena dampieri*).  
Photo – Gordon Roberts/Parks and Wildlife



**Above** Echidnas can be found in Yalgorup National Park.  
Photo – Sallyanne Cousans



**Above right** The view of Lake Clifton as seen through the window of a bird hide.  
Photo – Simon Cherriman

**Below** Guided activities are held in the park by Parks and Wildlife rangers.  
Photo – Parks and Wildlife

stilts, red-capped plovers and three species of sandpiper.

The park is also home to many native mammals that shelter in the woodlands. In particular, it is an important habitat for the western ringtail possum (*Pseudocheirus occidentalis*) which has a contracted distribution and is now only abundant in some southern coastal

locations, and around Busselton. A number of western ringtail possums have been translocated from housing development sites to Yalgorup National Park. Visitors may also be lucky enough to see chuditch (*Dasyurus geoffroyi*), quenda (*Isoodon obesulus*), short-beaked echinidas (*Tachyglossus aculeatus*) and bats.



## Do it yourself

**Where is it?:** Yalgorup National Park is 50km south of Mandurah and is located on the western edge of the Swan Coastal Plain just south of the Dawesville Channel.

**Camping:** Camping, as well as gas barbecues, a camp kitchen, tables and toilets are provided at Martins Tank Lake Campground. Camping fees apply and can be paid to the campground host or via an honour system when they are not present. The camp sites are issued on a first-come, first-served basis.

**Guided activities:** Guided activities and other programs are run in the park from time to time and during peak holiday periods. See the noticeboard in the park, or contact the local Parks and Wildlife office for more information.

Please note there is no firewood available at the campground and fires should not be lit between October and March. Drinking water is also not available in the park.

**Nearest Parks and Wildlife office:**  
Mandurah Work Centre, 423 Pinjarra Road, Mandurah WA. Phone: (08) 9303 7750.  
Visit [parks.wa.gov.au](http://parks.wa.gov.au).





# A LONG ROAD

BY JEREMY THOMAS

In July 2008 a 750-year-old boab tree began a 3200km, first-of-its-kind trek to its new home in Kings Park, Perth. More than six years later, the magnificent and ancient tree has well and truly set root in its new location and in the hearts of those who have watched its journey.



**D**eep in the Kimberley, about 30km from the north-west tip of Purnululu National Park, at a place called Warmun, known also as Turkey Creek, stood a magnificent mature boab tree (*Adansonia gregorii*). The tree, believed to be as much as 750 years old, was in an area to be impacted by planned road works on the Great Northern Highway, and had been identified as significant by the local Gija Aboriginal community. In 2008, representatives from Maunsell, Main Roads' engineering contractors, contacted the Botanic Gardens and Parks Authority (BGPA) for advice on how to transplant a tree of this size. The authority offered one thing better: a new home for the tree, which became known as 'Gija Jumulu'. What ensued was a first-of-its kind operation, which presented logistical challenges at every turn – from its initial preparation and transport, through to its establishment in a new environment more than 3200km south of its origin.

## SOWING THE SEEDS

The BGPA has initiated many successful transplant projects during the past 20 years. The translocated plants enhance the amenity of the park and provide visitors with opportunities to learn about tree preservation options in urban development. It was identified that translocating the 'Gija Jumulu' boab would provide millions of park visitors with the opportunity to see and enjoy this ancient specimen while learning about the species and its natural environment. Although smaller boab trees had been transplanted to Kings Park in the past, this project was unique in many ways, and highly ambitious, due to the size and age of the tree, its remote location and the distance it needed to be transported.

It quickly became apparent that the operation would require input from and support of various local and State Government agencies, as well as a range of private companies and community groups.

.....  
*Previous page*

**Main** 'Gija Jumulu' the 750-year-old boab tree in its new home at Kings Park.  
*Photo – Dave Blumer*

**Above** The boab tree at its original location in the Kimberley.  
*Photo – Patrick Courtney*

*Opposite page*

**Left** It was necessary to excavate the root ball by hand.

**Right** Lifting out the 37-tonne tree by crane.  
*Photos – Jeremy Thomas/Botanic Gardens and Parks Authority*



With only three months to prepare for the move, negotiations began with a range of potential partners including tree transplant experts, transport specialists, the highway construction company and consultant project managers. In total, 13 project partners confirmed their support through generous donations of time, labour and equipment.

Also critical was consultation with and support from the Gija Aboriginal community, who ultimately gifted the tree to Kings Park and whose people performed a traditional smoking ceremony to bless it on its journey to its new home.

## THE JOURNEY

To prepare the tree for transport on a low loader semitrailer and enable a two-lane highway journey, some judicious pruning from its original size of more than 17m tall and 10m wide was required. An estimate of the tree's weight was made based on photographs and the necessary

equipment was arranged to transport the tree – thought to be between 15 and 20 tonnes. However, it was only when the root ball was unearthed and significant roots were found to be encased in decomposing granite, which required hand excavating, that the weight was found to be 37 tonnes. Thankfully, fast-thinking project managers were able to mobilise new equipment to the site to accommodate the extra unanticipated weight.

At the time of relocation in July – the middle of the dry season – the tree was leafless and in full dormancy. This was an advantage because it provided some natural protection and an offset to trauma that might have occurred during preparation and transport. So, with the tree roots wrapped for protection, and to retain moisture during transport, the long journey began.

## ON THE ROAD

The sheer size and weight of the load meant that only daylight travel was

possible. This provided many opportunities for people to witness the amazing sight as the tree made its way south and passed through towns such as Fitzroy Crossing, Port Hedland, Meekatharra, Cue, Eneabba and Muchea. Water was delivered to the tree along the way to ensure its roots remained moist, while pilot and police escorts diverted all traffic in front of the boab until it passed. This required major logistical considerations once the tree arrived in Perth where powerlines were lifted or lowered, street signs were removed, parked cars were towed and selected roadside trees were pruned to enable an uninterrupted passage.

Finally, after centuries of growing, several months of planning and six days of driving, the tree was welcomed by thousands of people who came to witness its arrival at Kings Park, where Noongar elders performed a welcome smoking ceremony.



**Left** The team involved in extracting the boab.  
*Photo – Jamie Shaw*

**Above** Police escort 'Gija Jumulu' on its six-day journey to Perth.  
*Photo – Jeremy Thomas/Botanic Gardens and Parks Authority*

## SETTING THE SCENE

Of course, excavating and transporting the tree was only the start. Preparing the site was critical to the success of the transplant, as experience had shown that boab roots quickly rot and deteriorate if they are transplanted to a site without excellent drainage. Although the natural Kings Park soil is deep yellow sand, more than 70 cubic metres of screened coarse river sand was brought in to ensure there was good soil moisture drainage. Once the site was prepared, a large crane was used to lift and place the tree in its new location overlooking the Swan River.

Once 'Gija Jumulu' was in the ground, a monitoring program was implemented to record its progress. Kings Park staff monitored and recorded soil moisture, and conducted annual aerial inspections of the tree's canopy and root system. In addition, annual inspections of the tree's main stem internal tissue have been carried out using sonic tomography – a sophisticated process in which sensors are placed around the main stem that emit and record sound wave velocity. This provides an indication of the tree's health as the velocity of sound differs through healthy tissue compared with decayed and non-functional tissue. Using a complex algorithm, data is converted into

a colored tomogram which indicates areas of change. Different colours represent changes in the functionality of the tissue but, since baseline data is not available for boab wood tissue for comparison, some caution is required to interpret the data. Through consultation with independent arboricultural consultants and ongoing in-house inspections, staff continue to build a database of information that will guide ongoing management.

An impervious cover was also fitted over the surface of the root zone to redirect rainfall and prevent rotting. This cover is removed during the drier months and reinstated during winter. Hydrological data from the Kimberley helps determine the watering schedule, including flood watering which is carried out using a customised subterranean irrigation system.

## SIGNS OF SUCCESS

BGPA staff at Kings Park anxiously waited for the first signs of new growth on the boab and indications that it was emerging from its dormant, deciduous state signaling the transplant had been a success. As new apical and epicormic growth emerged within the crown, it was the first flower that surprised everyone at the end of its first summer in Perth.

Seeing multiple flowers developing this soon after the transplant was

viewed with cautious optimism. But, concerns were allayed when flowers were discovered for the first time on the other boab trees in Kings Park and 'Gija Jumulu' continued to show positive signs of growth. Initial efforts to hand-pollinate the flowers proved fruitless (literally) as flowers – which emerge at night and last only several days before withering – are naturally pollinated by a Kimberley moth.

## ROUGH PATCH IN RECOVERY

During 2009 the first indications emerged that surface decay was occurring on the south side of the tree's main stem and that areas of pressure damage from transport and crane lifting were extending in size. Although inspections initially indicated an increase in decay, new healthy callus (wound wood) was discovered forming beneath it, so close monitoring of the new callus continued. In 2011, arboricultural staff began removing the dead and decayed surface material to protect the new wood and encourage healthier development. Although this process was unsightly, and initially alarmed visitors about the health of the tree, there was little doubt it was in the best interests of the boab. Today, there are damaged areas that have been completely covered by new, healthy wound wood tissue.



“Inspections around the base of the main stem and arterial roots show some typical decay but there is an underlying presence of advanced callus and new roots extending well out beyond the severed roots. These are all positive signs that the tree is recovering well from the transplanting process.”

## CURRENT STATUS

Since being translocated in July 2008, ‘Gija Jumulu’ has shown promising progress with new growth above and below the ground. Annual aerial inspections have indicated consistent canopy growth, albeit with lighter density, as would be expected. The portions of the canopy damaged in transit all show positive regeneration of callus and new epicormic and apical growth.

Each year BGPA staff select and inspect an area of the root system to monitor the presence and progression of decay, repair, root growth and extension. Inspections around the base of the main stem and arterial roots show some typical decay but there is an underlying presence of advanced callus and new roots extending well out beyond the severed roots. These are all positive signs that the tree is recovering well from the transplanting process.

Relocating a mature tree of this size, and managing the aftermath of trauma,

was always going to be challenging. But ‘Gija Jumulu’ has demonstrated an extraordinary ability to defend and repair itself while adjusting to its new home in Kings Park. What has also been astounding is the ongoing level of community interest in ‘Gija Jumulu’ – from the people in the towns it passed through who came out to see it, to those who have visited it in its new home. It has become the second most common subject of enquiry at the Kings Park’s Visitor Information Centre and staff working in the boab’s vicinity struggle to achieve their work programs due to the enormous visitor interest in the tree. This has prompted the installation of additional interpretation material to meet the insatiable interest in this iconic and much-loved boab, which now stands tall in its new home at Two Rivers Lookout – a far cry from its origins in the Kimberley – where hopefully it will prevail for at least another 750 years.

**Top left** Preparation at the Kings Park site.

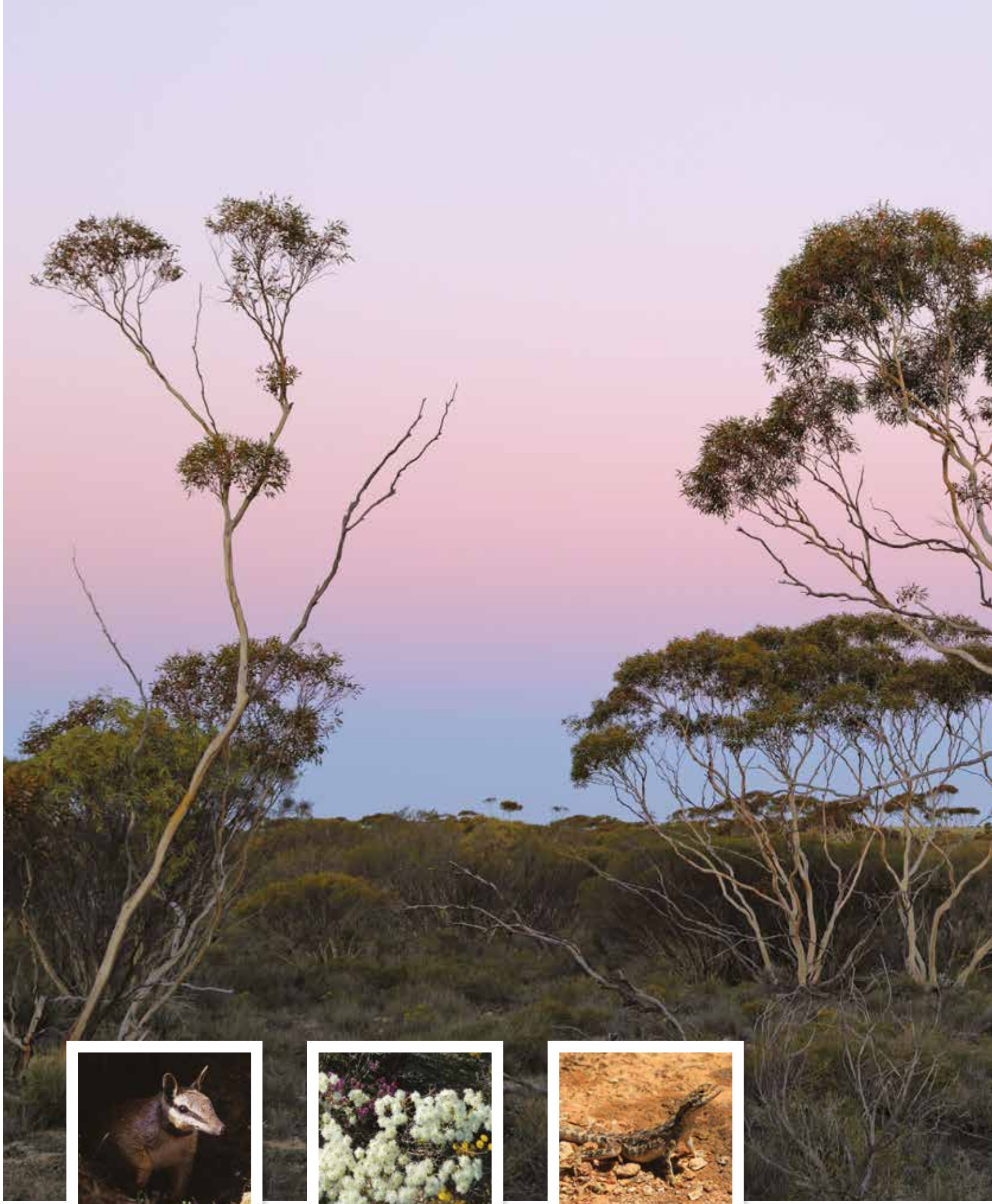
**Above left** Evidence of new root growth.

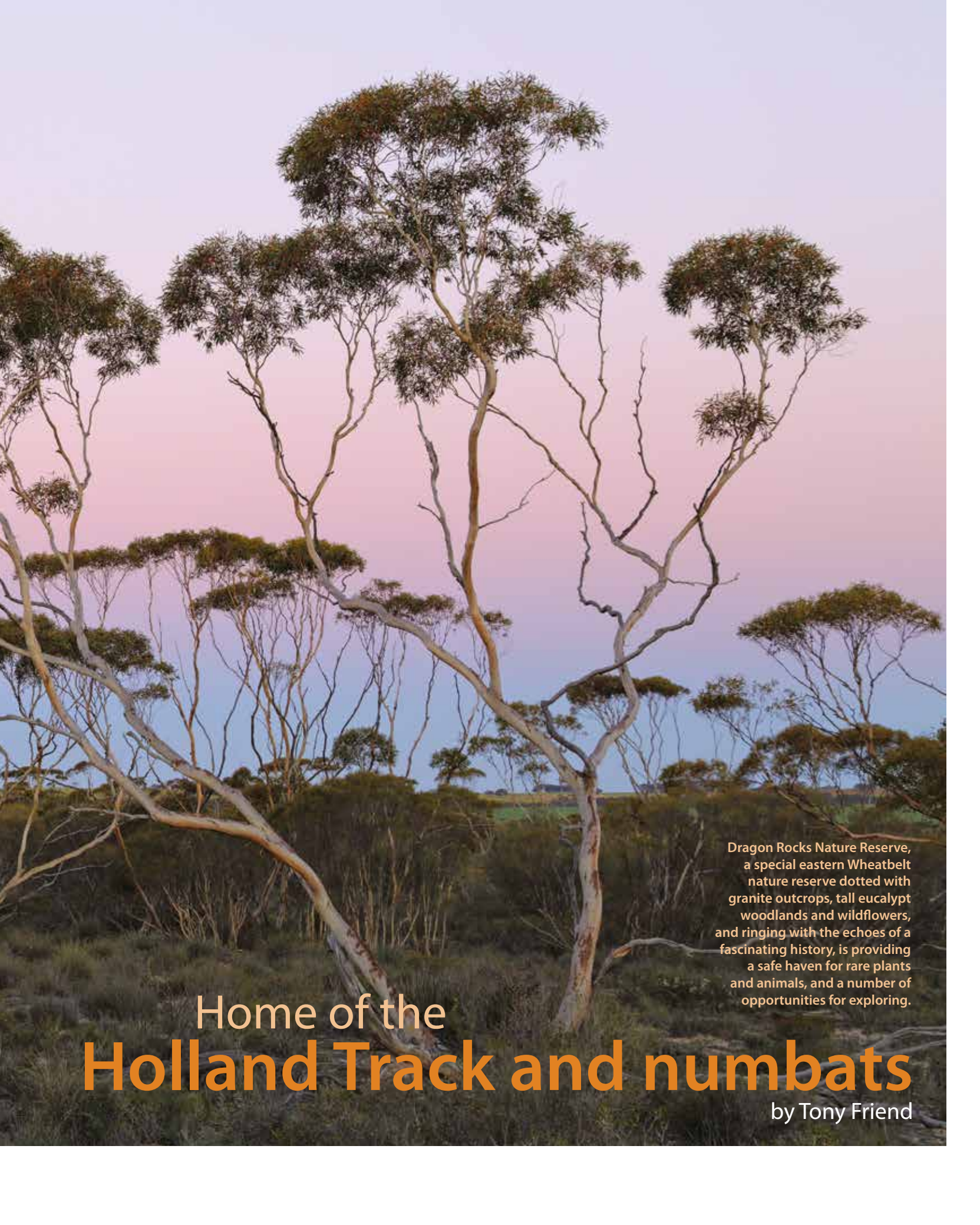
**Above** ‘Gija Jumulu’ in flower.

**Below** An aerial inspection of canopy growth.  
*Photos – Jeremy Thomas/Botanic Gardens and Parks Authority*



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Dragon Rocks Nature Reserve, a special eastern Wheatbelt nature reserve dotted with granite outcrops, tall eucalypt woodlands and wildflowers, and ringing with the echoes of a fascinating history, is providing a safe haven for rare plants and animals, and a number of opportunities for exploring.

# Home of the Holland Track and numbats

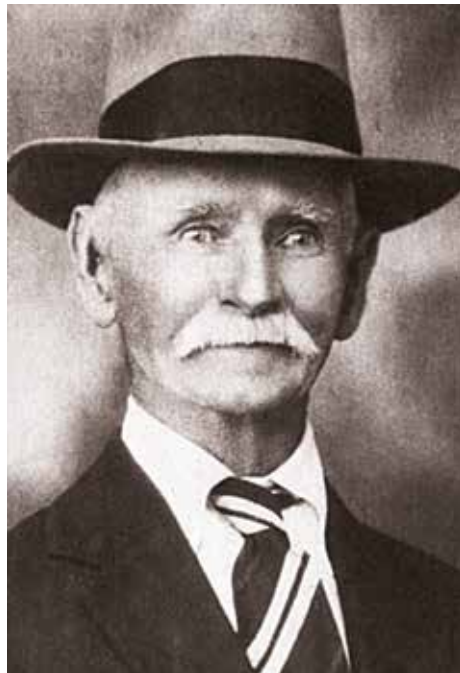
by Tony Friend

For a few years during the 1890s the peace and serenity of a low granite rock in today's eastern Wheatbelt, long known to the local Nyaki-Nyaki people, was disturbed. During this time, the landscape carried the sounds of creaking horse carts and wheelbarrows, as hopeful souls trudged along the Holland Track (also known as Holland's Track), towards Coolgardie. Some of these prospectors would have camped on the grassy meadow beside the rock, while others would have just passed through as part of their two-week journey to the Goldfields. Either way, they called this area 'Dragon Rock', not after mythical fire-breathing creatures, but after the abundant small native lizards known as ornate dragons (*Ctenophorus ornatus*) that scurry across warm rock surfaces in the sunshine.

## A NEW ROUTE

In the months after Arthur Bayley and William Ford discovered gold in Coolgardie in 1892, access to the town was by a long trek east from the railway towns of York and Northam. To overcome this, John Holland and his three companions cut the Holland Track in 1893, in just over two months. The track ran from Broomehill to Coolgardie, and provided an alternative route to the Goldfields, particularly for would-be gold miners arriving by ship from the eastern states and disembarking in Albany, the major Western Australian port at that time. They would take the train to Broomehill before starting their two-week slog along the 500km track. Holland picked a fairly straight route linking rock outcrops, soaks and claypans where water could be found, and the new track was quickly taken up, with welcome benefit to the burgeoning community of Broomehill.

The bustle of traffic along the Holland Track came to an abrupt end just three years later when a new railway line was pushed through from Northam to Coolgardie. After 1896, peace descended on Dragon Rock once more. This was to continue until the years following WWI, when the Western Australian Government released land for agriculture



in the region and clearing for cereal crops began. The nearby settlements of Lake Grace, Newdegate and Hyden were established at that time. Bushland was cleared to within 1.5km of Dragon Rock, but the land surrounding the rock and a large swathe extending another 25km north, perhaps not so attractive for agriculture, remained as unallocated Crown land. Future release of this land may have been anticipated, as a wheat collection facility was built adjacent to the reserve on Holt Rock Road.

## A NATURAL HISTORY

In 1966, Richard Lane, who owned property adjoining the western edge of this land, approached the then Department of Fisheries and Fauna, a predecessor of Parks and Wildlife, requesting that the large area of uncleared land to the north of Dragon Rock (now known as Dragon Rocks) be gazetted as a flora and fauna reserve. Before any further action could be taken, a soil survey was required and the boundaries, roads and tracks had to be surveyed by the Department of Lands and Surveys. These were carried out by August 1972, the same month that the first detailed wildlife survey of the Dragon Rocks area was carried out by Fisheries and Fauna scientists.

The wildlife survey revealed the area to be rich in plants and animals



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Main Dragon Rocks Nature Reserve.

Photo – Andrew McInnes

Insets left to right Numbats are long-term residents of the reserve.

Photo – Jiri Lochman

Verticordia brightens the landscape when in bloom.

Photo – Tony Friend/Parks and Wildlife

Ornate dragons lend their name to the reserve.

Photo – Matt Swan/Parks and Wildlife

Above left John Holland at age 92.

Photo – Courtesy of Broomehill Historical Society

and in extremely good condition.

Among the rare and interesting mammal species found were the red-tailed phascogale (*Phascogale calura*), western mouse (*Pseudomys occidentalis*), kultarr (*Antechinomys laniger*) – a small carnivorous marsupial, chuditch (*Dasyurus geoffroii*) and numbat (*Myrmecobius fasciatus*), which had been recently sighted in the area by Mr Lane. Malleefowl (*Leipoa ocellata*) were common and 58 other bird species were recorded during the survey, as well as 19 reptiles and four species of frogs. The scientists' report on the area was glowing, stating: "The diversity and quality of the flora and fauna of the Dragon Rocks



**Above** Trekking Holland Track.  
Photo – Ann Storrie

**Above right** Dragon Rocks Nature Reserve is dotted with granite outcrops.  
Photo – Andrew McInnes



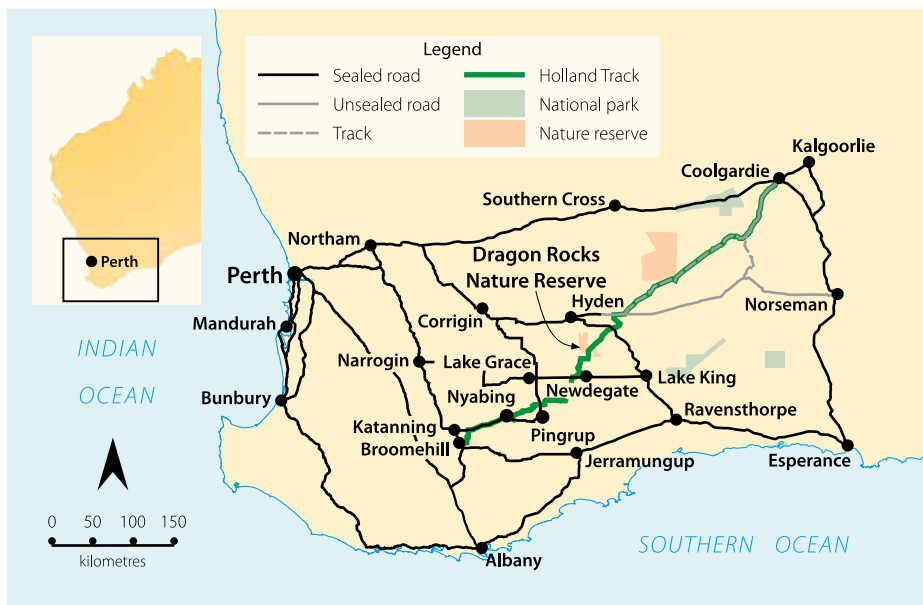
“In 2003 the reserve was listed on Australia’s Register of the National Estate as an area significant for rare species of plants and animals.”

area make it potentially one of the most valuable wildlife sanctuaries in Australia”.

An area of 32,203ha was gazetted in 1973 as Dragon Rocks Nature Reserve and given ‘A’ class status in recognition of its high importance as a wildlife sanctuary. Subsequent surveys of the plants in the reserve have shown that many rare species are also protected here. With her report and detailed vegetation map produced in 1992, consultant Anne Coates listed 28 vegetation associations with a total of 576 plant species, including a number of declared rare flora. In 2003 the reserve was listed on Australia’s Register of the National Estate as an area significant for rare species of plants and animals.

## AN ATTRACTION

Following the opening of the Northam to Coolgardie rail line, parts of the cart track were maintained and can still be traced in the road network



today. However, much of the route beyond the Rabbit Proof Fence quickly became overgrown. In 1992, Graeme Newbey, who was brought up on a farm near the departure point of the track at Broomehill, worked with other enthusiasts to push a new track through from the Hyden-Norseman Road, following the northern part of Holland’s original route as closely as possible. Today, the Holland Track provides a scenic and interesting four-wheel-drive experience for many

off-roaders and is fast becoming one of Australia’s great outback adventures.

The reserve also displays some outstanding scenic features. Granite rocks abound, although more spectacular examples exist in the region, like Graham Rock, Bushfire Rock and the better-known Wave Rock and Hippos Yawn. While the topography at Dragon Rocks is gentle, the reserve is studded with spectacular natural washouts, or breakaways. One of these is easily accessible from the northern



**Above** A numbat.

**Above right** Buckley's Breakaway is close to Dragon Rocks Nature Reserve.  
 Photos – Jiri Lochman

**Right** Malleefowls are also found in the reserve.  
 Photo – Simon Cherriman



boundary of the reserve, but visitors should also go to Buckley's Breakaway Nature Reserve, off the Kulin-Holt Rocks Road west of Dragon Rocks, where an information shelter and walk trail display and explain the origins of this remarkable natural feature.

Wildflowers abound in spring, but Dragon Rocks Nature Reserve is at its most spectacular in November, with the rich display of *Verticordia* species. The heathlands are also transformed by small shrubs covered in flowers.

## A HISTORY OF CONSERVATION

Late in 1995 the silence at Dragon Rock was disturbed again, this time by the sound of a light aircraft flying at low altitude up and down the length of the reserve. The plane was dropping meat baits laced with 1080 poison in order to reduce the numbers of introduced foxes there. An unsuccessful search for the

distinctive diggings of the numbat in the reserve had been carried out the year before and a plan to reintroduce numbats to Dragon Rocks Nature Reserve had been approved. Fox control carried out since the early 1980s at Dryandra Woodland, near Narrogin in the Great Southern, led to a dramatic increase in the numbat population there, which enabled the woodland to be used as a source of numbats for translocation to reserves where they had become extinct.

In December 1995, the first consignment of numbats arrived from Dryandra, all fitted with radio collars so

their fates could be monitored closely. Twenty numbats made the journey in 1995, followed by another 17 in December 1996. Survival rates of the released animals were very high, and breeding followed, with 10 site-bred young captured in 1996 and another 27 in 1997. A third release, planned for 1997, was cancelled because it was deemed unnecessary. This was the most successful reintroduction of numbats to date in WA under the recovery program.

Protection of the Dragon Rocks numbat population by fox control through distribution of baits both by aircraft and by



**Above** Mitchell's hopping mouse.  
Photo – Jiri Lochman

**Above right** Southern scrub-robin.  
Photo – Rob Drummond/Lochman  
Transparencies

**Below right** Radio collared numbats.  
Photo – Tony Friend/Parks and Wildlife



“... cameras revealed how rich the mammal fauna of the reserve remains, and also that numbats still exist there!”

vehicle along firebreaks continues today, under Parks and Wildlife's *Western Shield* program. By the early 2000s, however, staff carrying out the ground baiting began to report sightings of feral cats during their baiting runs. Radio collars had been removed from the numbats, so the only means of detecting them was by occasional opportunistic sightings, and by searching for diggings. A few sightings were reported and occasional diggings surveys confirmed the presence of numbats in the reserve, but these signs were less numerous.

The most recent diggings survey was carried out over three days in December 2012, without success. Were numbats still present? Research on feral cats and their interactions with foxes began in 2013, and sensor cameras were set throughout the reserve, some well away from tracks, to detect these predators. As well as foxes and cats, which were much more common on tracks than in the bush, a wide range of native animals were photographed. Although it was not the aim of the exercise, the cameras revealed how rich the mammal fauna of the reserve remains, and also that numbats still exist there! Chuditch were often photographed, as well as malleefowl, red-tailed phascogales, brush wallabies (*Macropus irma*), and Mitchell's hopping mice (*Notomys mitchellii*). More common species appearing frequently in the images include western grey kangaroos (*Macropus fuliginosus*), echidnas (*Tachyglossus aculeatus*), common brushtail possums (*Trichosurus vulpecula*) and emus (*Dromaius novaehollandiae*). The cameras also recorded the presence of the southern scrub-robin (*Drymodes brunneopygia*), a bird not previously recorded in Dragon Rocks Nature Reserve, although widely distributed in the Wheatbelt of WA.

Dragon Rocks Nature Reserve is undoubtedly important in preserving eastern Wheatbelt vegetation

communities, rare plants and natural landscapes, as well as its rare animals. The sensor camera images show that the reserve continues to support most if not all of the rich wildlife noted by long-standing local residents of the area and the early survey workers. It is well worth the effort to refine and enhance control of foxes and feral cats so that this large and important site continues to contribute to the conservation of some of our more endangered animals.



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Protecting the nature of the  
**Kimberley**



The *Landscape Conservation Initiative* – the largest conservation project ever undertaken in Western Australia – was established in 2011 as part of the State Government’s \$81.5 million *Kimberley Science and Conservation Strategy*, to retain and enhance current natural biodiversity and landscape values in the north Kimberley. WA’s vast, wild and beautiful Kimberley is one of the world’s last great wilderness areas and a national biodiversity hotspot.

**By Ben Corey, Ed Hatherley, Amanda Moncrieff, Ian Radford and Carolyn Thomson-Dans**

Since its inception in 2011, the *Landscape Conservation Initiative* has been guiding a range of measures to protect biodiversity values across property boundaries in the north and central Kimberley. This bold project is being implemented by Parks and Wildlife in collaboration with native title holders and Aboriginal ranger groups, government agencies, non-government organisations and pastoralists. Together, these partners are managing fire, the impacts of introduced animals, and the impacts of invasive plants over an area of more than 65,000km<sup>2</sup> (6.5 million hectares) which includes pastoral properties, lands held under native title, private conservation areas and parks and reserves managed by the department.

## PROTECTING NATURE THROUGH FIRE

Parks and Wildlife has been working closely with traditional owners and Indigenous rangers from four native title claim groups, the Kimberley Land Council and the Australian Wildlife Conservancy to undertake prescribed burning in the early dry season across the north Kimberley.

Each year since 2011 an average of 24,000km has been flown over the central and north Kimberley, involving (on average) 273 hours in fixed-wing aircraft and helicopters, to drop 60,000 incendiaries, creating mosaics of burnt and unburnt vegetation that mimic fire practices employed by Aboriginal land managers for millennia.

The expanded early dry season prescribed burning programs have created mosaics of burnt and unburnt patches of vegetation which provide refuges for wildlife and have greatly reduced the destructive effects of late (hot and extensive) dry season fires.

## FERAL ANIMALS

Since 2011, almost 20,000 feral cattle have been removed from areas with high biodiversity values in the north Kimberley thanks to a collaboration between Parks and Wildlife and surrounding pastoralists. Feral pigs, cats and horses have also been



“... these partners are managing fire, the impacts of introduced animals, and the impacts of invasive plants over an area of more than 65,000km<sup>2</sup>...”

removed opportunistically as part of the program. Monitoring plots have been established in high priority areas to measure the effects of cattle removal on habitat.

More than 860 donkeys were removed from 2010 to 2013 from the north Kimberley as part of the Department of Agriculture and Food Western Australia’s Judas animal program. This program has successfully maintained feral donkeys at very low numbers across the north Kimberley.

A cane toad quarantine strategy for the Kimberley islands is being prepared by Parks and Wildlife to help prevent cane toads establishing on any Kimberley islands. Working with traditional owners will be critical to the success of keeping islands free from toads.

## WEEDS

Since 2012, Parks and Wildlife has engaged traditional owners on a fee-for-service arrangement to map and treat weed infestations in the Mitchell River area. This has included the use of CyberTracker technology to map nearly 430 separate infestations.

More than 13ha of isolated patches of grader grass (*Themeda quadrivalvis*) – a Weed of National Significance – were treated before it set seed.

El Questro Station, the Wunggurr Rangers and Parks and Wildlife staff are



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Main King Leopold Ranges Conservation Park.  
Photo – David Bettini

Top Aerial view of mosaic burning.  
Photo – Ed Hatherley/Parks and Wildlife

Above Aerial ignition is carried out using helicopters and fixed-wing aircraft.  
Photo – Geological Survey of Western Australia

working together to eradicate a 100ha infestation of gamba grass (*Andropogon gayanus*), a Weed of National Significance with the potential to transform landscapes into a monoculture and fundamentally alter fire patterns.

Parks and Wildlife engaged the Bunuba Rangers in Fitzroy Crossing to undertake conservation work on their country, including the implementation of



**Above left** Scaly-tailed possum (*Wyulda squamicaudata*).  
 Photo – David Bettini

**Above** Aboriginal ranger groups conduct aerial burning with Parks and Wildlife staff.  
 Photo – Ed Hatherley/Parks and Wildlife

**Left** Buckle Head.  
 Photo – David Chemello/Parks and Wildlife

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susceptible to the catastrophic effects of late dry-season fires.

Reducing feral cattle numbers by up to 46 per cent in areas of high biodiversity value has improved habitat condition by reducing soil compaction and trampling of vegetation, particularly around sensitive wetlands and rainforest patches. Feral donkeys, horses and pigs have been kept at very low numbers in the north Kimberley.

Threatened mammals such as golden bandicoots (*Isodon auratus*), koorrawal or golden-backed tree-rats (*Mesembriomys macrurus*) and pakooma or brush-tailed rabbit rats (*Conilurus penicillatus*) have been increasing in numbers and distribution across the Mitchell Plateau, as a result of better management of fire. The north Kimberley is now a stronghold for mammals threatened by fire and

a weed control program in Geikie Gorge National Park and King Leopold Ranges Conservation Park.

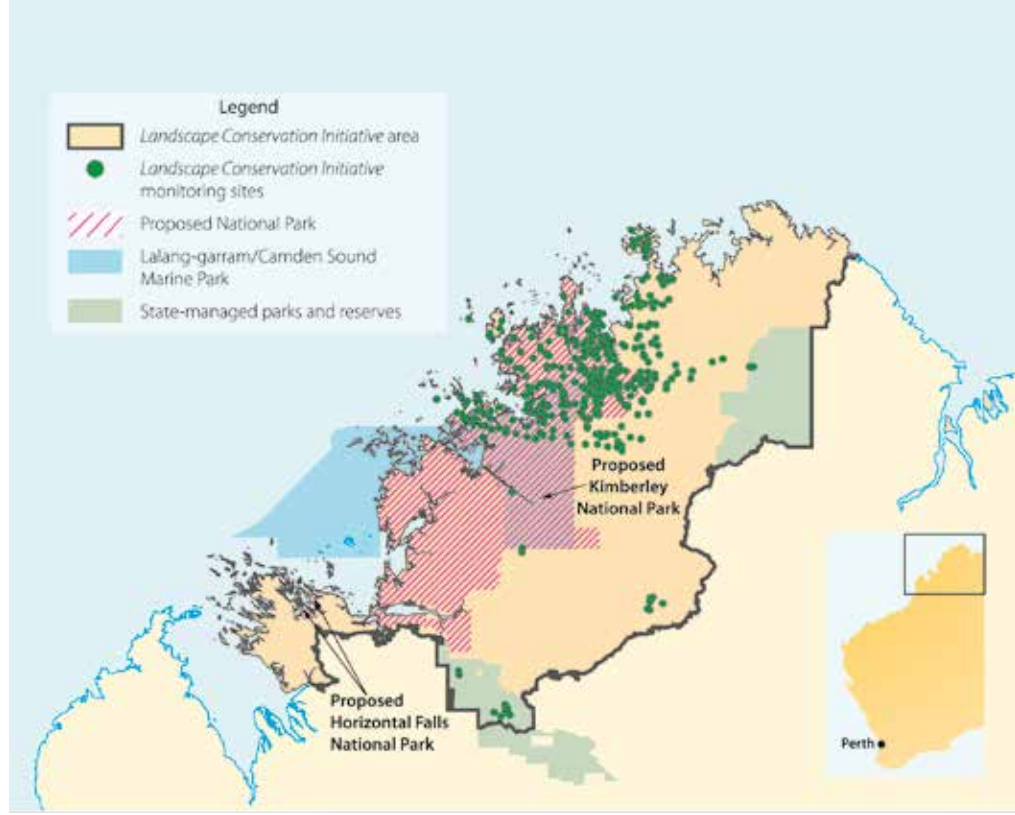
## MEASURING SUCCESS

Parks and Wildlife is monitoring the success of the *Landscape Conservation Initiative*. Since 2011, nearly 600 monitoring plots have been established across the north Kimberley to evaluate and improve land management programs. This has included mapping nearly 100 rainforest patches that provide vital habitat for threatened wildlife and quantifying vegetation condition at almost 400 sites.

Trapping for small-to-medium-sized mammals has been carried out over an equivalent of more than 15,000 trapping nights across 86 sites with Aboriginal rangers and traditional owners.

## MEASURABLE CONSERVATION IMPROVEMENTS

So far, the results have been dramatic. Better management of fire has already halved the amount of country burnt by destructive late dry-season fires from 36 per cent to 17 per cent and improved habitat for wildlife, such as threatened small mammals and finches, that are



feral animals elsewhere across northern Australia.

Weed control programs have reduced infestations of serious and damaging weeds in the high biodiversity Mitchell Plateau and ensured new populations of high-priority weeds do not become established.

## ABORIGINAL PARTNERSHIPS AND EMPLOYMENT

More than 200 traditional owners from groups including Dambimangari, Wunambal Gaambera, Wilinggin, Bunuba and Balanggarra were engaged in activities with Parks and Wildlife to help protect country and manage threats such as fire and weeds.

Under the *Landscape Conservation Initiative* there were more than 50 fee-for-service contracts for feral animal and weed control programs since 2011, involving the Dambimangari, Uunguu, Wilinggin, Balanggarra, Gooniyandi and Bunuba native title groups.

The Kalumburu Aboriginal Corporation has entered into an agreement with Parks and Wildlife that will provide conservation, tourism and cultural management outcomes and employment opportunities for traditional owners on the 313,155ha Carson River Station, WA's northern most pastoral property. Works to date have included

**Above left** Quade Martin with a native mouse.  
Photo – Ben Corey/Parks and Wildlife

**Right** Installing funnel traps.  
Photo – Corrin Everitt/Parks and Wildlife



biodiversity surveys, re-establishing fences and fire management.

The *Landscape Conservation Initiative* supports partners in meeting specific targets set out in their Healthy Country plans by developing more capacity and providing resources for traditional owners to look after country.

The success of the program was recognised when it recently won the 2014 Premier's Award in the Environment Category. This award honoured the scale and scope of the project which sets the benchmark for new approaches to conservation worldwide where conservation is being achieved across the landscape, not just in WA's precious parks.

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**Landscape Conservation Initiative  
Kimberley Science and  
Conservation Strategy**

**B**ees are the workhorses of the agricultural sector, pollinating the flowers of many different types of plants that we rely on for food. And the vast majority of pollinating is done by just one species, the honeybee (*Apis mellifera*). Honeybees were introduced to Australia by colonialists to provide high-energy nutrients and to pollinate crops and ornamental flowers. But, long before the introduction of honeybees, native bees flourished in the Australian environment, producing an array of different species found nowhere else on Earth. Some have been used by Aboriginal people as a source of honey – a delicious treat in an environment with limited food resources.

Colletidae is the biggest Australian bee family. With nearly 900 named species, it represents more than half of the species found in Australia. Many are quite small and rarely seen by the casual observer, but they play a vital role in the maintenance of healthy ecosystems by pollinating a variety of native plants. Unlike the honeybees, whose queens make a nest using her offspring as workers, most Australian bees are solitary, and females mate with one or more males and lay eggs in a brood cell in the ground or galleries in dead wood or plant stems.

Although new Australian bee species are being regularly found by taxonomists, it's not often that a bee comes along that stumps the experts. And that's exactly what happened when bee expert Dr Terry Houston, then Curator of Insects at the Western Australian Museum, and Museum volunteer Otto Mueller, were collecting in Forrestdale on the outskirts of Perth. Otto spotted an insect entering a hole in the ground and collected it as it re-emerged. They quickly netted a male flying close by. It turned out to be a bee about the size of a honeybee but with an unusually large head. Terry knew that they had found an extraordinary new species of Colletidae. Evolutionary biologists love solving puzzles, and Terry was instantly curious about the reasons behind the big head and jaws. Do they use these features for defence? Do they grip the females during courtship and mating? Or do males



## *Leioproctus muelleri*

fight with each other to gain access to females? Well, he found that while a female excavates her burrow and brood chamber, her male suitor positions himself below the burrow entrance looking upward. And good luck to any male who dares to approach his girl. The male's enlarged head and mandibles enable him to repel any would-be adversaries so he can retain sole mating rights with his chosen mate. This type of behaviour had previously not been recorded for a solitary bee species, making this one of the most interesting species to be discovered in Australia in recent years.

The scientific paper reporting the discovery of this bee, known by common name 'megamouth bee', was published in late 2012 by Terry and Dr Glynn Maynard, another Australian bee specialist. In recognition of Otto's contribution to the discovery of the bee, they named the species *Leioproctus muelleri*, and included it in an entirely new subgenus, *Ottocolletes*. It's a fitting reward for Otto's initial observation of an insect flitting into a hole in the ground. This discovery highlights how locations close to Perth can be treasure-troves for fascinating animals with unusual life histories.

**Above** Megamouth bees have unusually large heads.

**Below** A pair of megamouth males in combat.  
Photos – Bryony Fremlin



**Discovered** is a regular series prepared by scientists at the Western Australian Museum (Department of Culture and the Arts) and Western Australian Herbarium (Parks and Wildlife). Each article highlights new and noteworthy discoveries of plants and animals in WA, and offers insights into the work of the scientists whose jobs involve discovering, naming and describing WA's marvellous living riches.





OUR SOUTH-WEST ESCAPE

# THE LEEUWIN- NATURALISTE CAPES

The stunning Leeuwin-Naturaliste capes area offers a host of things to do and places to explore for visitors and the many people who call it home, all while supporting an abundance of native plants and animals. A management plan for the parks and reserves of the area will guide how this special place will be managed, to ensure it can be enjoyed for generations to come.

BY JOANNA MOORE



**H**eading ‘down south’ to Western Australia’s beautiful south-west corner is a popular getaway, whether for a weekend escape or a longer holiday. And it’s no wonder. The area’s pristine beaches offer world-famous surfing and spectacular snorkelling, or simply beautiful places to enjoy a laze on the sand, play in the wash or go looking for things that have washed ashore. Meanwhile, the exceptional forests provide an opportunity to reconnect with nature along the area’s many drives, rides and hikes, and at the places along the way where you can stop and enjoy a picnic or camp overnight. The multitude of nature-based tourism and recreational activities include exploring the fascinating cave and karst system, visiting the two historical lighthouses and learning about the area’s significant Aboriginal heritage.

Leeuwin-Naturaliste National Park alone draws some 2.7 million visits a year, making it the most popular national park in WA. And, while visitors arrive with their boats, bathers and surfboards, their hiking, fishing and caving gear, and their cameras and wildflower books, the locals too feel a strong connection to this patch. Many of those who live in Augusta, Margaret River and Dunsborough, and the smaller towns

in between, have strong attachments with the natural landscapes that surround them. Their lifestyles, and often livelihoods too, are connected to the environment through the beach culture and the inspiration drawn from the wetland, forest, cave and karst and coastal environments.

This brings with it an ever-increasing pressure on the very values for which the area is cherished. The *Leeuwin-Naturaliste capes area parks and reserves management plan 2014* will manage the values of the Leeuwin-Naturaliste capes area. In addition to Leeuwin-Naturaliste National Park, it includes Scott and Bramley national parks, Gingilup Swamps Nature Reserve, plus a range of other smaller national parks, nature reserves, timber reserves and State forest. At more than 21,000ha Leeuwin-Naturaliste National Park is the area’s largest park, with the others ranging in size significantly, some being less than a hectare.

Together they cover almost 37,500ha extending 95km along the Leeuwin-Naturaliste Ridge, from Cape Naturaliste in the north to Cape Leeuwin in the south and a further 36km east of Augusta along the Scott Coastal Plain. The area covered by the management plan extends across three local government areas – Busselton,

Augusta-Margaret River and Nannup – and is less than 250km, or three hours drive south of Perth.

It is this easy access, combined with its proximity to the hundreds of local wineries, breweries, restaurants, art galleries and makers of gourmet produce, plus heritage and cultural sites and much more, all located among striking visual landscapes, that contributes to the area’s popularity.

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*Previous page*

**Main** Shelley Cove.

*Photo – Andrew McInnes*

**Above left** Cape Leeuwin.

**Above** Acacia forest, Leeuwin-Naturaliste National Park.

*Photos – Ann Storrie*

*Opposite page*

**Left** Wetlands at Biljedup Cliffs.

*Photo – Marie Lochman*

**Right** Red-tailed black cockatoos.

*Photo – Sallyanne Cousans*



“... while visitors arrive with their boats, bathers and surfboards, their hiking, fishing and caving gear, and their cameras and wildflower books, the locals too feel a strong connection to this patch.”

## A HOTSPOT FOR BIODIVERSITY

These landscapes contain a range of natural values including an extensive karst system, important wetlands and conservation-significant species and communities. In fact, the Leeuwin-Naturaliste capes area sits within Australia’s only internationally recognised biodiversity hotspot – one of just 35 in the world. A biodiversity hotspot is a biologically significant region that supports high numbers of plants and animals that can only be found in that area and that also face a high degree of threat. The internationally recognised south-west region is one of Australia’s 15 national terrestrial biodiversity hotspots.

## BLOOMING VARIETY

The flora of the area contributes significantly to this international and national recognition, and the stunning wildflower display from July to November is another drawcard for visitors. Like many parks and reserves

in the south-west, Leeuwin-Naturaliste National Park is rich in the number of plant species it houses, particularly because it encompasses a range of ecological communities. Overall, the Leeuwin-Naturaliste capes area contains some 1577 native vascular species, representing 198 families, including the orchids, peas and acacias, eucalypts and paperbarks, sedges, banksias, grevillea and hakea, and daisies.

Twelve species of rare flora occur in the area including the Dunsborough spider orchid (*Caladenia viridescens*), Scott River boronia (*Boronia exilis*) and Naturaliste nancy (*Wurmbea calcicola*). There are also dozens of priority-listed species, several geographically significant species, and many which are at the edge of their range. For example, the population of karri (*Eucalyptus diversicolor*) at Boranup – a popular scenic location – is separated by more than 10km from its most northern occurrence at Cape Clairault and those of the lower Blackwood River.

## WETLANDS

The area includes two nationally significant wetlands – the Gingilup-Jasper wetland system and the permanent Cape Leeuwin system. It also contains part of a candidate site proposed for nomination under the international Ramsar Convention on Wetlands, which includes Forest Grove National Park, a small reserve and also an area of private property. This site provides important habitat for the critically endangered white bellied frog (*Geocrinia alba*), which is thought to occupy an area of just 1.9km<sup>2</sup>.

## CAVES AROUND

The Leeuwin-Naturaliste Ridge has a unique geology, including several hundred karst features. These include dolines, caves, solution pipes, root casts and subterranean drainage channels. The highest concentration of caves occurs in the Boranup area, while many sea caves can be seen along the coast around Cape Naturaliste. These landscape features are beautiful and irreplaceable.

They are also significant for the important subterranean communities they support, as well as for cultural heritage, visitor recreation, and education and research opportunities. Interesting finds have been made, such as fossils and archaeological specimens, including evidence of Noongar occupation and remains of extinct marsupials, reptiles and birds. These caves have been a major drawcard to the region for generations, and access is now carefully managed to conserve these important systems, while maintaining access for people to experience.

## SPECIAL RESIDENTS

Land clearing, the introduction of exotic species (particularly foxes and cats), climate change, and changing hydrological and fire regimes have all impacted native animals found in the Leeuwin-Naturaliste capes area. While several extinctions have occurred since European settlement, the area still remains one of high value and priority for fauna conservation. Surveys indicate that there are at least 29 mammals (including four bat species), more than 128 bird species, 11 species of frog (all endemic to the south-west), 33 reptile species, nine fish species (of which six are endemic) and 54 invertebrates.

Fifteen threatened species have been recorded in the area including the quokka (*Setonix brachyurus*), chuditch (*Dasyurus geoffroii*), brush-tailed phascogale (*Phascogale tapoatafa*) and western ringtail possum (*Pseudocheirus occidentalis*). This also includes birds such as the forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*), Baudin's cockatoo (*C. baudinii*), Carnaby's cockatoo (*C. latirostris*), Hutton's shearwater (*Puffinus huttoni*) and Australasian bittern (*Botaurus poiciloptilus*).

## COMMUNITY ATTACHMENT

Locals as well as visitors from across WA, interstate and overseas are drawn to the south-west corner's natural playgrounds to challenge themselves through outdoor activities such as hiking, kayaking and abseiling, to commune with nature, or to simply relax. Many organisations, groups and individuals play an active role helping with management activities, and community involvement has been central to planning for its ongoing management. As part of this, a draft management plan for the area was released for public comment by the Conservation Commission of Western Australia in December 2010. More than 130 submissions were made on the plan.

Balancing visitor use with protecting natural, cultural and heritage values is essential. The final plan will allow for recreational activities while ensuring



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**Top** Western ringtail possum.  
Photo – Jiri Lochman

**Above** New Holland honeyeater.  
Photo – Andrew McInnes

**Right** Abseiling at Wilyabrup Cliffs.  
Photo – Jiri Lochman





**Above left** Quindalup Beach.  
*Photo – Natasha Moore*

**Above** Trekking the Cape to Cape Track.  
*Photo – Alicia Dyson*

**Left** Dunsborough spider orchid (*Caladenia viridescens*).  
*Photo – Ann Storrie*

**Far left** Surfing at Reef Break.  
*Photo – Brett Dennis/Lochman Transparencies*

natural, cultural and heritage values are maintained.

Some of the comments received on the draft management plan centred on fire management. Bushfire is a real and significant threat across the Leeuwin-Naturaliste Ridge and Scott Coastal Plain, and managing this threat is complex and challenging for many reasons. These include the area's mix of land tenures and land-use types, the fragmented nature of Leeuwin-Naturaliste National Park – which has a very large perimeter for its area – and the potential impacts of mitigation strategies on small businesses, particularly in the tourism and viticultural industries.

Adding to this is the impact of drier climatic conditions which increase the risk of potentially damaging bushfire conditions and make it harder to manage and control fire, strong coastal winds,

the variety of coastal, wetland and forest vegetation types, and the need to protect the area's important conservation values. And of course the popularity of the area as a tourist destination means there are many visitor recreation sites in bushfire risk areas along the coast and in bushland. In addition, there are many homes dotted throughout the area – often surrounded by bushland – that people live in full-time or use on holidays and weekends, or for holiday rental accommodation.

Fire management strategies tackle these challenges through prescribed burning, mechanical fuel management, the identification of asset and strategic protection areas, and detailed planning between State Government agencies, local government, traditional owners, community and volunteer groups, adjacent land managers and private landholders. All



**Top right** Slender lobelia (*Lobelia tenuior*).  
Photo – Jiri Lochman

**Far right** The area provides many opportunities for hiking.  
Photo – Pippa Moore

**Right** Yellow tailflower (*Anthocercis littorea*).  
Photo – Marie Lochman

**Below right** The 'Access for More' walk to Sugarloaf Rock.  
Photo – Pippa Moore

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in Leeuwin-Naturaliste National Park. Visitors to the area can enjoy camping, caving, bushwalking, horseriding, mountain biking and four-wheel driving. It contains threatened ecological communities, karst features and habitat for the critically endangered white-bellied frog. An impact study of the area will be carried out to identify what recreational activities can occur there. This will guide future management of the area to ensure recreation and conservation are carried out hand-in-hand.

Major improvements to visitor facilities are underway at Conto Campground – a popular camping site south of Margaret River – thanks to a \$1 million investment under the State Government's \$21.05 million *Parks for People* initiative. This provides for a range of affordable camping and caravan options to ensure people have access to enjoy and experience WA's natural and iconic areas. A number of upgrades are planned for Conto Campground, such as an additional 30 camp sites which will accommodate about 80 campers, as well as new kitchens and toilets. The lighthouse precincts remain ever popular, bookending the Leeuwin-Naturaliste capes (see 'Beacons of the capes', *LANDSCOPE*, Summer 2005–06). And of course Leeuwin-Naturaliste National Park is intimately

connected to the recently gazetted Ngari Capes Marine Park – a wonderland of marine values and recreation opportunities (see 'Feature park: Ngari Capes Marine Park', *LANDSCOPE*, Summer 2012–13).

## ABORIGINAL HERITAGE

Some 14 language groups are known today as Noongar, and two of these have their tribal territory in the Leeuwin-Naturaliste area. These are the Wardandi people, located between Bunbury and Cape Leeuwin, and the Pibbelmen people, who occupy the lower Blackwood River. Traditionally, Noongar people migrated seasonally between these coastal areas and their hinterlands to use various resources. Most activity was, and still is, near fresh water sources, which were used for camping, hunting, foraging and fishing.

More than 1130 artefacts including several stone and bone relics, animal remains and engraved stone plaques have been found at Devil's Lair, providing a valuable record of Noongar life in the Leeuwin-Naturaliste region. Artefacts found at the site indicate the first human occupation in the area to be as early as 50,000 years ago, making it one of the oldest and most reliably dated occupation sites in Australia.

Aboriginal people are the primary source of information on the value and

conservation of their heritage. Engagement and collaboration with Noongar people is an important part of managing the Leeuwin-Naturaliste capes area.

Taking care of the south-west corner is everyone's responsibility. With so many visitors coming to the region to enjoy its stunning beaches, awe-inspiring forests and nature-based tourism and recreation opportunities, it is critical the area is managed to ensure the area's uses and natural values are enjoyed for many generations.



**Joanna Moore** is a freelance writer and editor. Born and raised in WA's beautiful south-west corner, she relishes the opportunity to write about this special place. She can be contacted on 0438 557 688 or by email (jo.theimprovingpen@gmail.com).

*The author would like to acknowledge the many Parks and Wildlife staff, as well as other stakeholders, who contributed to the development of the Leeuwin-Naturaliste capes area parks and reserves management plan.*

## AUSTRALASIAN NATURE PHOTOGRAPHY Photography book

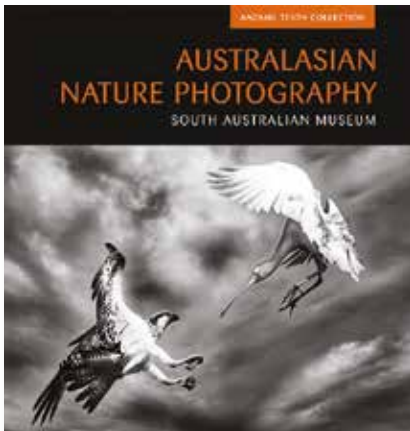


Celebrating the 10th year of the *Australian Geographic* ANZANG Nature Photographer of the Year competition, this book showcases the winners and other outstanding entries, picked from 1850 images from photographers in 11 countries. And it's nothing short of spectacular.

The photos in *Australasian Nature Photography* are truly awe-inspiring. The competition's overall winner, which is featured on the cover, is a magnificent shot taken by Western Australia's David Rennie, who captured a mid-air interaction between an osprey and a spoonbill in Mandurah wetlands. Western Australian plants and animals feature across the various competition categories which include animal portraits, botanical and underwater subjects, wilderness landscapes, shots of threatened species, black and white and interpretive photos and depictions of the effects of human impact. There is also a category for junior submissions. Each photograph is accompanied by technical information and an anecdote about how the picture was taken.

The competition was started by Perth surgeon Dr Stuart Miller in 2003 (see 'Nature's album', *LANDSCOPE*, Autumn 2006) and has been administered by the South Australian Museum since 2009, this year in partnership with *Australian Geographic*.

*Australasian Nature Photography* was published by CSIRO Publishing and is available as a 112-page paperback book for \$39.95 from [www.publish.csiro.au](http://www.publish.csiro.au).



## AUSTRALIAN NATIVE PLANTS: THE KINGS PARK EXPERIENCE Technical guide

Most Perthites have a special place in their hearts for Kings Park. Located just a kilometre from the CBD, it provides a setting for picnics and play dates, hosts lazy Sunday brunches and special functions, challenges those who run, walk or ride along its network of paths and provides a beautiful setting for quiet contemplation at its many memorial sites. It even provides the backdrop for many wedding and pre-ball photos. Regardless of what attracts the locals and the many hordes of tourists who visit the park each year, one thing unites them: an appreciation of the magnificent display of native plants.

This book, edited by Botanic Gardens and Parks Authority CEO Mark Webb, provides a comprehensive guide to the horticulture of native plants. It contains chapters penned by experts in their field that cover plant propagating and grafting, the use and benefits of tissue culture, methods of seed collection and storage, and the role of smoke in improving germination which make for an interesting read even to those who, like me, lack a green thumb. It also covers more garden variety (pardon the pun) topics, such as watering, fertilising, pruning and mulching, which are illustrated by helpful photos and drawings.

The 144-page full-colour paperback was published by CSIRO and is available from [www.publish.csiro.au](http://www.publish.csiro.au) for \$39.95.

## CANE TOAD APP Mobile application



All Western Australians need to be on the lookout for cane toads – whether you're in the State's north-west, living in the south-west or travelling in between. Cane toads are prevalent in the east Kimberley and despite comprehensive ongoing efforts, they are continuing to move west.

Australia has a remarkable number and variety of frogs, of which more than a third (about 80 different species) occur in WA. The impact of the arrival of cane toads on native frogs is twofold: being threatened by cane toads themselves and becoming the victims of mistaken identity at the hands of people who think they are disposing of a cane toad. It is estimated that up to two-thirds of suspected cane toads turn out to be harmless native frogs.

Recently updated to include south-west frogs as well as Kimberley species, this application has audio recordings of frog calls, photos and written descriptions to help users distinguish between poisonous cane toads and harmless native frogs. It even has a 'Frog log' where you can document frog sightings and also contains important contact information for reporting suspected cane toad sightings.

The application was created by UWA's SPICE enrichment program for secondary science teachers, in partnership with Parks and Wildlife, and is available to download free from the iTunes store. For more information about cane toads visit [www.dpaw.wa.gov.au/canetoads](http://www.dpaw.wa.gov.au/canetoads).





# Postcards to home

Once widespread across Western Australia, chuditch suffered a drastic population decline after European settlement. Conservation efforts have now restored the species to such an extent that animals from local populations are helping to re-establish numbers in South Australia, with some very positive results.

by Rhianna King, Kelly Rayner, Brent Johnson and Lizzie Aravidis



**C**huditch or western quoll (*Dasyurus geoffroii*) are Western Australia's largest carnivorous marsupial. Their characteristic white spots are believed to help break up their outline while moving through the woodlands at night, hunting for insects, birds, lizards and small mammals that make up their diet. Chuditch once occurred across 70 per cent of mainland Australia. However, with the arrival of Europeans and the ensuing introduction of predators, and land clearing, the species suffered a dramatic population decline. By 1994, when the first recovery plan for the species was prepared, chuditch were only found in the south-west of WA – in an area thought to be about five per cent of its former range.

In an effort to recover the species, the then Department of Conservation and Land Management devised a number of strategies to bolster the population. Translocations were a key component of the plan and a captive colony was established at Perth Zoo. Between 1990 and 2000, more than 330 individuals were bred and were translocated to six sites, at Julimar State forest, Lake Magenta Nature Reserve, Kalbarri National Park, Cape Arid National Park, Mt Lindesay National Park and a trial release at Lane Poole Reserve. By 2013, monitoring data indicated there were more than 10,000

individuals in the wild. A new recovery plan was written, which reflected the success of the previous actions and indicated that it was time to investigate reintroducing chuditch to other parts of Australia.

## FAR AND WIDE

In 2013 Parks and Wildlife was approached by the South Australian Department of Environment, Water and Natural Resources, in partnership with the Foundation for Australia's Most Endangered Species, to provide chuditch for a translocation into the Flinders Ranges National Park, where they were last seen in the 1880s. Research indicated that the Western Australian population was robust enough to support individuals being taken to form a new population, especially considering that females are capable of raising up to six young in a breeding season.

A plan was developed to release up to 40 Western Australian chuditch into the Flinders Ranges in 2014 and, if everything went well, additional animals could be released in both 2015 and 2016. Previous translocation experience showed that male chuditch tended to move further away from their release point than females, possibly in search of a mate. It was decided that female chuditch would



*Previous page*

**Main** Juvenile chuditch.

*Photo – Jiri Lochman*

**Inset left** Flinders Ranges National Park.

*Photo – Len Stewart/Lochman Transparencies*

**Inset right** Parks and Wildlife technical officer Sean Garretson releasing a chuditch at Julimar State forest.

*Photo – Melissa Jensen*

**Above left** South Flinders Ranges.

*Photo – Jiri Lochman*

**Above** Parks and Wildlife technical officer Kelly Rayner releasing a chuditch at Julimar State forest.

*Photo – Kelly Rayner/Parks and Wildlife*

be released at the site first, to give them an opportunity to establish, before the males were released four weeks later. Once the translocation plan had been finalised and the necessary approvals had been sought, Parks and Wildlife staff began work to collect chuditch destined for a new home.



“Research indicated that the Western Australian population was robust enough to support individuals being taken to form a new population, especially considering that females are capable of raising up to six young in a breeding season.”

## TRAPPING

The first objective was to collect 20 suitable females for the new population. Trapping was first carried out in Perup Nature Reserve – three and a half hours south of Perth – over four nights in March 2014. Parks and Wildlife staff set 100 traps, which yielded 27 chuditch. Of these animals, nine females were considered suitable for the translocation project. Each chuditch was aged and assessed for its overall health, based on their parasite load, body, coat and teeth condition and overall temperament. Only animals aged between one and three years old, and in good health, were considered for translocation. Then, in the following week, Parks and Wildlife staff travelled two hours north of Perth to Julimar State forest to carry out the second trapping event. This time, they set 151 traps over four nights and collected 11 suitable females – bringing the total number of females destined for South Australia to 20.

Once trapped, the chuditch bound for a new South Australian home were transported to purpose-built pens at the Native Animal Rescue facility (affectionately known as ‘Chuditch Hotel’) – a volunteer wildlife refuge in Malaga. Volunteers built 20 pens using funding and materials sourced by Native Animal Rescue and furnished them with a nest box, plants and hollow logs and branches for climbing. The chuditch were housed individually and fed mice, chicks, whitebait, boiled egg and carnivore pellets.

Once at the Native Animal Rescue facility, each animal was given a health check by the resident veterinarian and fitted with a radio collar that would enable them to be tracked once they were released at Flinders Ranges. Then, on 1 April 2014, the females were loaded onto a plane as precious cargo bound for Wilpena Pound in the Flinders Ranges, where it was hoped they would give the species a new lease of life across some of its former distribution.

**Above left** Parks and Wildlife’s Sean Garretson, Brent Johnson and Kelly Rayner putting a radio collar on a chuditch at the Native Animal Rescue facility in preparation for release.  
*Photo – Melissa Jensen*

**Top** ‘Wandoo’ a female chuditch that was translocated to South Australia.  
*Photo – Kelly Rayner/Parks and Wildlife*

**Above** ‘Chuditch Hotel’ at the Native Animal Rescue facility.  
*Photo – Lizzie Aravidis*

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The trapping process was then repeated at both Perup and Julimar four weeks later to source males. On 29 April 2014, the males were flown to South Australia to hopefully meet up with the females.



## BUILD IT AND THEY WILL COME

Once they arrived in South Australia, the Western Australian chuditch, plus four from a captive population in the Northern Territory, were welcomed to country by about 80 people who had gathered for a traditional blessing ceremony. Among those gathered were members of the Adnyamathanha people, to whom chuditch are a totem animal known as idnya.

The chuditch were released at two sites: Wilpena Pound and the Wilcolo Track. To test the impact of the release, some were released directly into the park, while others were released into pens with some food and water, to be set free into the park once they had had a few days to acclimatise to their new environment. Neither approach appeared to be more or less successful than the other.

## SOME GREAT SIGNS

It will be some time before the success of the program can be determined but the initial signs are positive. The radio collared animals were monitored each day for a month, using an aircraft fitted with tracking equipment, and ground tracking was used to respond to any likely mortalities. Trapping was carried out about four to six and 12 to 16 weeks after the releases in the hopes of recapturing every chuditch to assess their physical condition, as well as to check whether they were reproducing. All but three of the original translocated animals have been recaptured. Camera traps were also

used and individual animals were identified by their spot patterns.

The theory that males would remain in proximity to the females was found to be correct. Most pleasing has been the discovery that 13 of the original 21 females have been found with pouch young, with an average of six young each. Chuditch are believed to be occupying as many as 250 sites, including rabbit burrows, rock crevices and hollow trees and logs.

While cat control was carried out on the area before the animals were released, including the removal of 50 cats from the area, unfortunately predation by feral cats has claimed some of the translocated individuals. While this is disappointing, it's not a surprise and chuditch have already proved they can survive in environments where feral cats are present in WA. With targeted cat control where necessary, program managers are optimistic that, like their western relatives, the South Australian population will thrive. And, who knows, maybe one day this population will be used to translocate to other semi-arid and arid parts of Australia where this species once occurred.

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**Above Wilpena Pound, Flinders Ranges – one of the release sites.**

*Photo – Bill Belson/Lochman Transparencies*

**Above right Chuditch are known as idnya in South Australia.**

*Photo – Jiri Lochman*



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*For information about the Foundation for Australia's Most Endangered Species or to support their work in the recovery of species including the chuditch (idnya) go to [www.fame.org.au](http://www.fame.org.au).*



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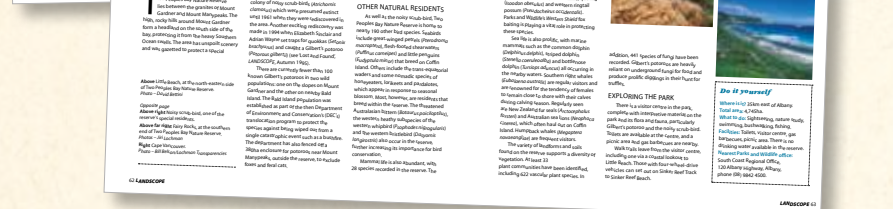
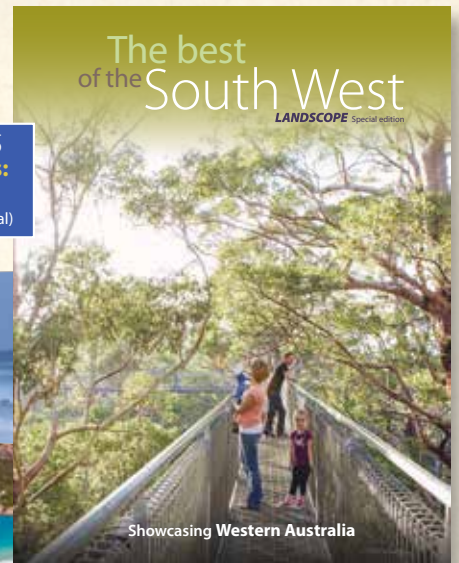
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*In collaboration*



# Four-wheel-drive champions

Volunteers from four-wheel-drive clubs around the State have joined Parks and Wildlife on a number of projects to improve and conserve off-road vehicle tracks, historic sites and the surrounding environment.

by Danielle Stone and Karla Graham

**H**eading into the bush in your free time with a four-wheel drive loaded with construction material for a day of hard work requires dedication and determination. That's exactly what members of Track Care WA and the Western Australian Four Wheel Drive Association – peak bodies for four-wheel-drive groups – have been doing since the 1990s to help maintain the tracks they love using.

This work is carried out by volunteers as part of Parks and Wildlife's *Track Adoption* program, coordinated by the department's Recreation and Trails Unit. The program enables groups to 'adopt' a track, an area or facilities to look after, in partnership with Parks and Wildlife.

The program encourages groups to become actively involved in conservation and recreation projects that support sustainable off-roading practices in WA. In turn, this maintains public access to the tracks while helping Parks and Wildlife minimise issues such as environmental impact, user-created tracks, illegal use of management tracks and other trails, damage to cultural sites and visitor risk. To date, it has helped many people with diverse backgrounds and interests make



meaningful, and sometimes challenging, contributions to unique and special places throughout WA.

### MORE THAN TRACK MAINTENANCE

The Land Rover Owners Club of Western Australia is one of the longest-running partners of the program. For more than 15 years, club members have been working with staff in Parks and Wildlife's Donnelly District on projects in and around D'Entrecasteaux National Park. Most recently, they assisted with a project to rehabilitate dunes on the Yeagarup and Warren beach tracks. Club members installed wind fences to catch the sand and

stabilise dunes. They also help to provide invaluable education to the broader four-wheel-drive community.

As well as helping to protect the environment and maintain tracks, many clubs also assist in conserving relics of WA's settlement heritage by restoring dilapidated homesteads, shearing quarters and other buildings on ex-pastoral station country. Track Care WA has completed a three-year project at Woolgorong Station in the mid-west, with volunteers working tirelessly to restore the old homestead which is more than 100 years old. Woolgorong, 170km north-east of Geraldton, was one of the earliest leases in the area taken up by Michael Morrissey in 1873 and later by Sir James Lee-Steere.



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**Main** Four-wheel-drive road in King Leopold Ranges Conservation Park.

*Photo – Tourism WA*

**Insets top to bottom** A member of the Armadale Four Wheel Drive Club assesses Captain Fawcett Track.

Alan and Jan Salter from the Toyota Landcruiser Club.

*Photos – Danielle Stone/Parks and Wildlife*

**Above left and above** Woolgorong Station before and after. Volunteers blended the old with the new, installing new windows and doors alongside the original mud bricks, and reconstructing the existing walls and roof.  
*Photo – Track Care WA*

**Left** Members of the Toyota Landcruiser Club work on a replica of the historic Congelin Stockyards.

*Photo – Danielle Stone/Parks and Wildlife*



**Above** South West Four Wheel Drive Club president Matthew Howard signs an adoption agreement for Lennard Track at Collie Dam with Parks and Wildlife ranger Jamie Gault.  
*Photo – South West Four Wheel Drive Club*

**Right** Volunteers from the Land Rover Owners Club install wind fencing at Warren Beach Track, D’Entrecasteaux National Park.  
*Photo – Land Rover Owners Club*

**Below right** Members of the Red Dog Four Wheel Drive Club construct a sign for Mount Meharry in the Pilbara.  
*Photo – Red Dog Four Wheel Drive Club*

The homestead was built in 1912 and housed the Murchison Roads Board from 1919 to 1921. During one of the club’s restoration trips in 2012, members of the team were busily working under an unseasonably hot sun when a man stopped in with his niece and her daughter during a trip to show them some of their country. His grandmother had lived in the homestead when the station was mustering sheep, and he was interested to see it being restored.

## THE PROGRAM EXPANDS

The program has grown considerably since its beginnings in the 1990s, with many more clubs coming on board. The Red Dog Four Wheel Drive Club works with Parks and Wildlife staff in the Pilbara Region to undertake maintenance on the Mount Meharry Four Wheel Drive track before the dry season. While, in



“Whether it’s conserving heritage by rebuilding a 100-year-old homestead on an ex-pastoral station, or protecting the environment around a track, what really makes the program work is the people.”

Lane Poole Reserve south of Perth, the Armadale Four Wheel Drive Club has been trained to assess tracks, and club members are now skilled in spotting issues on the Captain Fawcett Track and are working with local staff to develop a maintenance program to keep the track in good shape. The Dryandra area in the Wheatbelt has been adopted by the Toyota Landcruiser Club, whose members not only help with four-wheel-drive track maintenance, but maintain walk trails and promote the history of the area. Their current project is building a replica of the historic Congelin Stockyards.

The South West Four Wheel Drive Club recently signed a five-year adoption of Lennard Track near Collie. Already, the club and staff from Parks and Wildlife’s Wellington District have installed new picnic sites, conducted track maintenance and saved a 200-year-old grasstree in Wellington National Park. And volunteers from a number of clubs recently spent a week working on the beautiful Dirk Hartog Island with staff from the Parks and Wildlife Shark Bay District (see ‘Turning back time on Dirk Hartog Island’, *LANDSCOPE*, Spring 2014).

Whether it’s conserving heritage by rebuilding a 100-year-old homestead on an ex-pastoral station, or protecting the environment around a track, what really makes the program work is the people. All the individuals involved, whether

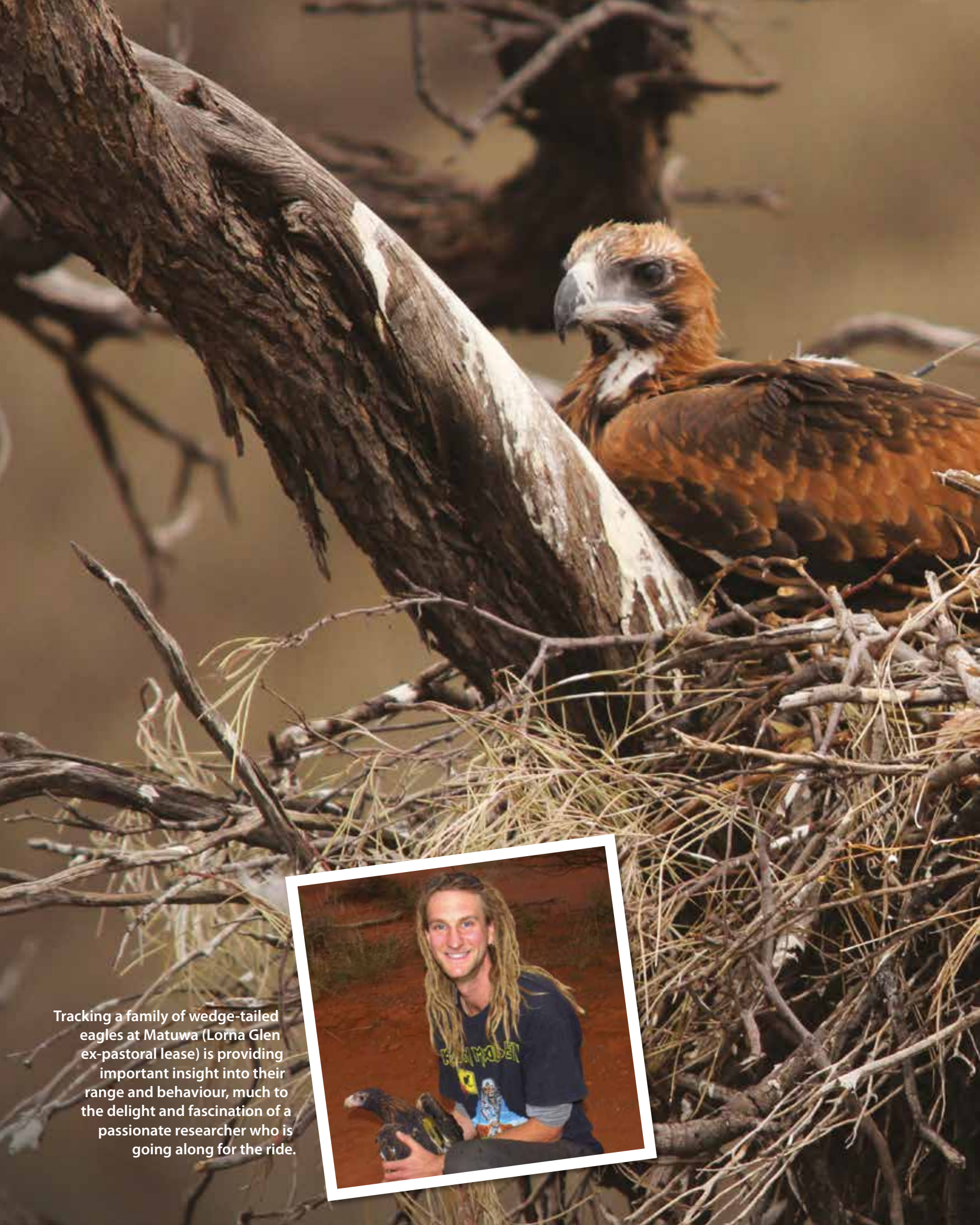
they are four-wheel-drive enthusiasts or Parks and Wildlife employees, share a common love for this amazing and diverse State, and recognise that it’s all about striking a balance between recreation and conservation. And what a great way to spend time – with friends, at the end of a long but productive day in a spectacular location.



**Danielle Stone** is a Parks and Wildlife senior recreation officer and can be contacted on (08) 9334 0574 or by email ([danielle.stone@dpaw.wa.gov.au](mailto:danielle.stone@dpaw.wa.gov.au)).

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For more information or to get involved, contact the Western Australian Four Wheel Drive Association at [www.wa4wda.com.au](http://www.wa4wda.com.au) or by email ([secretary@wa4wda.com.au](mailto:secretary@wa4wda.com.au)) or Track Care WA at [www.trackcare.com.au](http://www.trackcare.com.au) or by email ([info@trackcare.com.au](mailto:info@trackcare.com.au)).



Tracking a family of wedge-tailed eagles at Matuwa (Lorna Glen ex-pastoral lease) is providing important insight into their range and behaviour, much to the delight and fascination of a passionate researcher who is going along for the ride.



*A word from the field*

# Secret lives of 'wedgies'

by Simon Cherriman



**W**hen you have an adult wedge-tailed eagle (*Aquila audax*) tucked under your arm, it's really important to keep hold of those legs. The skin-tearing talons on the end of each toe, together with several tonnes of crushing power per foot, make them a formidable force. Just watch a kangaroo joey get carried off into the sky by our largest bird of prey to get an idea of how foreboding they can be to their victims.

Why on earth am I holding one?, you might ask. Well, having just fitted a satellite transmitter to the eagle using a specially designed harness, I was ready to let it go. So, while pinning the wings with one hand and gripping the tarsi (legs) firmly with the other, I place it down on the ground. Then I quickly let go and step back...

Seeing a 'wedgie' soaring effortlessly above the landscape is an iconic image of the outback. It is a sight I enjoyed many times as a young boy on family holidays around Western Australia. Going on to study and photograph eagle biology while at university and for years afterwards further fuelled my quest to find out more about these majestic birds. They are intelligent, powerful predators and strong, adept flyers. Though they are one of the better-studied raptors in Australia, satellite tracking technology used in recent years by scientists around the world to follow bird movements, remains mostly absent from Australian research. The eagles' size makes them perfect subjects for long-term studies because they are able to carry larger types of tracking devices (known as platform terminal transmitters or PTTs), which are powered by solar panels and attached to the birds with a backpack mount.

## OUTBACK RESEARCH

In late 2011, I began researching wedge-tailed eagle ecology at Matuwa, also known as Lorna Glen (see 'Desert Eagles; wedge-tailed eagles at Lorna Glen', *LANDSCOPE*, Spring 2013), supported by the then Department of Environment and Conservation. The area is managed under the Wiluna Martu Land Management



*Previous page*

**Main** A juvenile wedge-tailed eagle wearing a satellite tracking device.

*Photo – Simon Cherriman*

**Inset** Simon Cherriman with an eagle fitted with a PTT.

*Photo – Gill Basnett*

**Above** Eagles have wing spans of up to nine feet.

*Photo – Simon Cherriman*

**Above right** The 'chook pen' cage trap.

*Photo – Gill Basnett*

project and is jointly managed by the traditional owners and Parks and Wildlife. This study site provided an ideal location to track birds, especially as detailed information on habitat use in relation to reintroduced threatened mammal populations was part of the research. In 2012 I set out to fulfil a boyhood dream and track the movements of adult wedge-tails and was fortunate to obtain a Parks and Wildlife community conservation grant to cover the costs of three PTTs. I also received an *Australian Geographic*



seed grant to help with logistics and the production of a community education website about the project. Retired WA eagle experts Michael Ridpath and Michael Brooker provided me with insights into the methods they used during their research in the 1960s. In June 2013, after months of preparation, we headed to Lorna Glen, in WA's remote outback, to attempt an adult eagle capture.

'How do you catch a wild wedgie?' along with 'How tall are you?' (I'm 6'8") and 'Do you play basketball?' (No), were common questions when people found out about my mission. A giant 'chook pen' cage trap with an open roof, built beneath a dead perch tree, would prevent eagles having their usual 'runway' needed to get airborne, once lured inside with a piece of carrion. Wedgies find it hard to resist a roo, and soon after arrival, we baited our traps with the road-kill collected on our way up. The stage was set.



**Left** View from a bird hide overlooking Kuyurnpa's nest.

**Below left** Falconry hoods are used to blind and calm the birds.  
Photos – Simon Cherriman

**Below** Fitting the PTT.  
Photo – Gill Basnett

“... he slowly opened his feet, looked at me for a few seconds, then raced forward and launched into the air, flying down the dirt track like a 747 leaving the airport.”

At mid-afternoon the next day, my heart thumped as we approached the first trap. I glanced between the shrubs as the vehicle slowed down. I was nervous. Suddenly, a parting in the bushes gave me a glimpse at the trap. A flurry of wing-beats blurred the scene as I noticed two eagles. One was outside the trap and promptly took off, while the other was inside. Finally, after all those years of build up, the moment I had been waiting for. I had one!

### AND THEN THERE WERE THREE

The eagle was an adult male, which I named 'Wallu' after the local Aboriginal

word for eagle 'Wallu-wurru'. It took about 40 minutes to fit the PTT, tag, weigh and measure the bird, before removing the falconry hood (used to blind and calm the bird during handling) and release. As I stood back and watched, he slowly opened his feet, looked at me for a few seconds, then raced forward and launched into the air, flying down the dirt track like a 747 leaving the airport.

The next day we succeeded in capturing an adult female we named 'Gidjee', an alternative spelling of the name for the eagles' favoured nest tree in the area. She was also fitted with a GPS

tracker. This bird was our prime target, as her territory, slightly further west than where Wallu was captured, overlapped with the 1100ha fenced enclosure at Lorna Glen, which contained threatened mammals.

Four months later I found myself clinging to the side of an eagle nest, face-to-face with Gidjee's healthy nine-week-old chick. A seven-week incubation period, that only a patient mother could sit out, together with regular delivery of food by her mate, had nurtured a female chick. Later diet studies revealed her 'baby food' included the occasional boodie or burrowing bettong (*Bettongia lesueur*), golden bandicoot (*Isodon auratus*), as well as many rabbits and goannas. I removed 'Kuyurnpa' (a Martu word meaning 'little girl') from the nest, fitted the third PTT, then placed her back. She was almost ready to fledge – only a week or so longer. Then, after



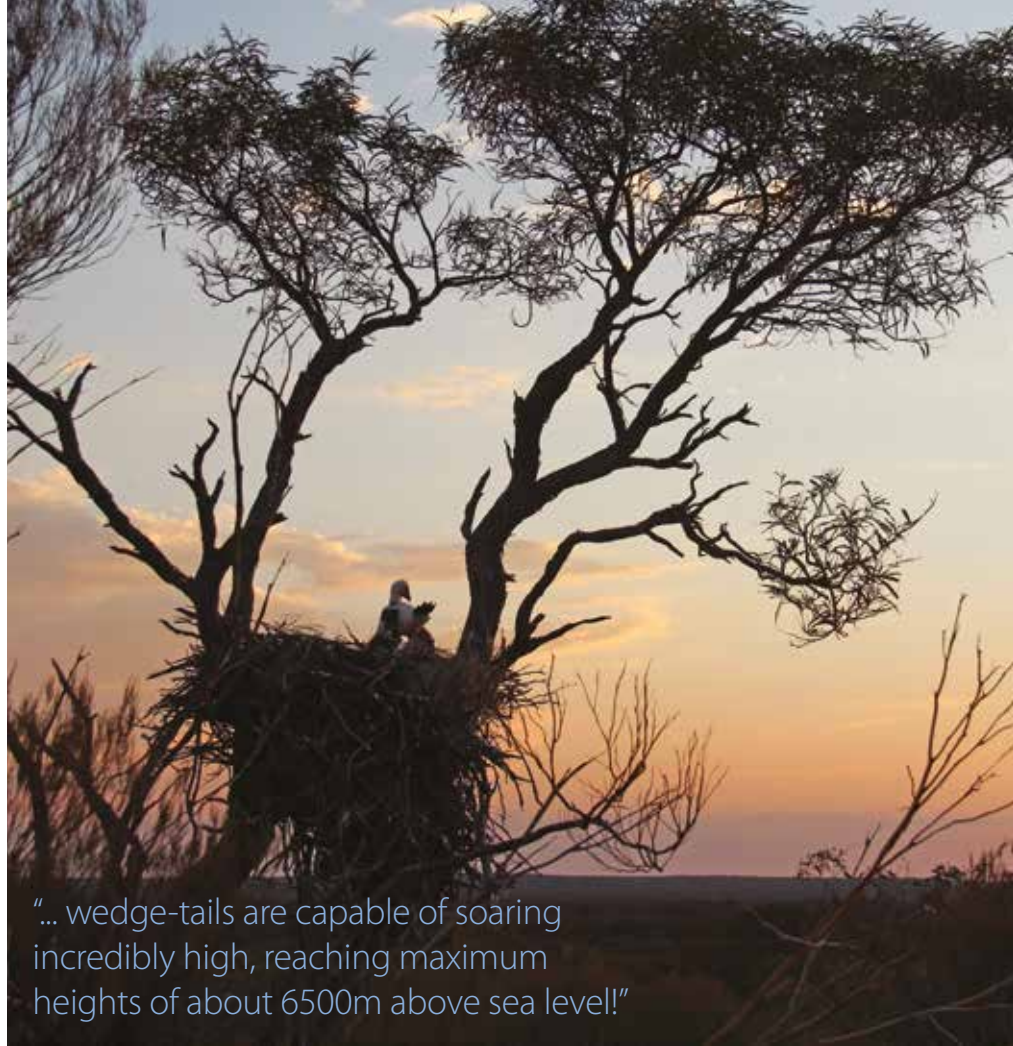
all that flapping practice on the nest, it would be time to use those massive, feathered appendages for the first time. And take me, via a virtual satellite connection, along for the ride.

## FASCINATING INSIGHT

In the 12 months since Wallu's capture, the tracking data has provided fascinating insights into the lives of wedge-tailed eagles. It has provided additional evidence that Lorna Glen adult wedge-tailed eagles are mostly sedentary in a fixed home range. Wallu and Gidjee maintained relatively small home ranges of about 45km<sup>2</sup> and 25km<sup>2</sup> respectively. The one exception was a 'Wallu Walkabout' where he travelled 60km to the edge of Lake Carnegie and back in a day.

Altitude data (accurate to 22m) has shown that wedge-tailed eagles are capable of soaring incredibly high, reaching maximum heights of about 6500m above sea level! This can probably be explained by thermal air currents, which peak during late spring and summer, and carry the eagles swiftly upwards. While these heights are exceptional, most of an eagle's daily routine occurs between ground level and about 1500m above sea level.

Although research in the 1970s showed that wedge-tailed eagle fledglings can travel hundreds of kilometres in their first year, this information came from banding birds as nestlings and recovering them months or years later; data on the 'in between' is missing. It is thought that juvenile and immature wedge-tailed eagles wander the country for perhaps several years before establishing a territory of their own, but almost nothing is known about where they go during this period. One of the most exciting parts of the eagle tracking project has been watching Kuyurnpa leave Lorna Glen at the end of March 2014 to begin her juvenile dispersal phase of life. By mid-April she had seen the ocean, roosting at 80 Mile Beach in the Pilbara. Since then, she has travelled over 14,800km around Western Australia, crossing the Great Victoria Desert twice and even roosting inside the South Australian border.



"... wedge-tails are capable of soaring incredibly high, reaching maximum heights of about 6500m above sea level!"

**Above** Wedge-tailed eagle nests can be up to two metres deep and nearly as wide.

*Photo – Simon Cherriman*

**Right** Simon prepares to return Kuyurnpa back to her nest.

*Photo – Mike Griffiths*

As this is the first time a juvenile Australian eagle has been tracked by satellite, any information on its movement patterns during this early phase of its life is totally new to science. Having a long-lasting transmitter attached to an arid-born eagle like Kuyurnpa will hopefully shed light on the species' early life. As this eagle tracking project continues, it is envisaged that more eagles from different climatic regions of Australia will be tracked in the future, gradually painting a clearer picture of these majestic raptors' lives.



**Simon Cherriman** is a biologist, filmmaker and environmental educator. He currently manages the small business iNSiGHT Ornithology, which aims to engage and inspire people about the environment, mainly through the science of birds (ornithology).

Visit [www.wedge-tailedeagletracking.blogspot.com.au](http://www.wedge-tailedeagletracking.blogspot.com.au) to read more about Simon's project and to view the trailer of the documentary *Where Do Eagles Dare?*



# HEAT in the peat

A fire in Lake Muir Nature Reserve presented unique challenges for fire managers. Lessons learnt from a past event, together with modern equipment and new science, helped determine a course of action and deliver a successful outcome.

On 5 October 1987 fire escaped from private property and burnt through 300ha of Tordit-Gurrup Lagoon within Lake Muir Nature Reserve on the State's south coast. Even though the lagoon was under water at the time, dry rushes over the water surface carried the fire. Initial attempts to extinguish it were unsuccessful due to wet conditions and an inability to safely access the area. Officers from the then Department of Conservation and Land Management (CALM) examined a number of ways to stop the fire spreading and prevent it from burning through extensive areas of peat during the upcoming summer months. These methods included constructing a trench by machines or by hand, installing a sprinkler system or burning out a much larger area that would control the fire but not prevent the peat burning. Then, on 25 February 1988, 30 CALM employees began constructing 3km of trench by hand, under very arduous conditions. The trench worked and the fire was successfully controlled.

## HISTORY REPEATS

Fast forward to 4 November 2013, when thunderstorms in the Lake Muir area resulted in a lightning-caused fire in the reed bed within Tordit-Gurrup Lagoon. The ignition point was in an inaccessible part of the wetland and, once again, conventional bushfire suppression techniques were not suitable. Parks and Wildlife crews used fixed-wing aircraft and helicopters to drop water to stop the initial fire and contain it to the peatland, while on the ground heavy earthmoving equipment was deployed to prepare firebreaks around Tordit-Gurrup Lagoon. These firebreaks would link to Lake Muir in case the burning peatland could not be extinguished.

While the water bombers had contained the fire, the next challenge was to extinguish the burning peat or, at least, safely control it for the summer. After much discussion among senior Parks and Wildlife fire managers, and after a review of the techniques used in the 1987 fire, it was decided that mini excavators would be used to construct a trench down to the watertable along the fire edge. This would contain the fire within the trench line and

by John Gillard and Ian Wilson



give fire managers the best opportunity for controlling it. Two mini excavators were sourced from local contractors and the trenching work began.

## PUTTING A PLAN INTO ACTION

To avoid the heavy equipment sinking into the peat, it was necessary to lay marine plywood sheets on the ground for the machinery to drive on. Moving the sheets to keep pace with the trenching work was a very strenuous task but one managed well by local Parks and Wildlife staff.

### *More than meets the eye*

Tordit-Gurrupe Lagoon and Lake Muir are part of the internationally significant 'Muir-Byenup system' Ramsar-listed wetland. The area has a variety of values, including old-growth jarrah forest; a high diversity of native plants and animals (including 10 threatened flora and 14 threatened fauna species); Aboriginal sites of mythological, ceremonial, cultural and spiritual significance; sites associated with early European settlement and the agricultural and forestry industries; and visitor facilities at the Lake Muir Observatory. The 10,630ha Muir-Byenup wetland is located within Lake Muir Nature Reserve and was listed under the Convention on Wetlands of International Importance especially as waterfowl habitat (also known as the Ramsar Convention) in January 2001.

### *What is peat?*

Peat is made up of decaying vegetation and has a high carbon content that makes it susceptible to ignition by bushfires when it is dry. Peat occurs in wetlands throughout Western Australia, and the seasonal nature of our climate means that most peat deposits are dry for a period each year. Peat fires can be ignited by lightning, accidental causes and by bushfires burning in adjacent dryland vegetation. Once ignited, peat fires can smoulder for months – well after the initial fire front has passed. In some parts of the world, peat has smouldered (sometimes undetected) for months, years, and even decades.

As peat burns it releases carbon monoxide and organic gases that can be very odorous and unpleasant. Smoke from peat fires can also cause health issues in people who are predisposed to respiratory issues. Fire managers carry out monitoring of peat fires to avoid any flare-ups but, where the fire is close to residential areas, air quality monitoring is also carried out.



Once the trench was complete there was still a section along the southern boundary of the fire in stands of *Melaleuca* paperbarks and fringing jarrah vegetation that continued to smoulder and contained areas of burning peat. These pockets were close to the containment line so posed a serious risk to the integrity of the fire boundary. Parks and Wildlife staff were deployed each day to 'wet down' these areas and extinguish the burning peat using water they accessed from a waterhole that was constructed adjacent to the fire boundary. They continued this until 21 November. The department also engaged a local farmer to supply and install an irrigation system with a travelling irrigator that was connected to the waterhole to flood the areas of smouldering and burning peat during December 2013. The irrigator worked for several days and was successful in extinguishing the burning peat.

### WASH-UP

This successful fire suppression effort relied on the collaboration of 40 firefighters from Parks and Wildlife, local volunteer bushfire brigades and the Forest Products Commission as well as input from local landowners and contractors. Twelve fire trucks, two earthmoving machines, two mini excavators, as well as two fixed-wing aircraft and one helicopter were involved in the operations. The management of

this incident used modern, sophisticated technology and new knowledge in fire-related science. However, just as important were the lessons learnt from the fire that occurred in the area in 1987. The effective work carried out by crews almost 26 years before was crucial in determining the course of action for the recent event, showing that history has a place in our future management. The result: the fire was contained to 80ha and was declared safe on 15 January 2014, 73 days after it started.

*Previous page*

**Main** Smouldering peat during the 2013 fire.

**Above left** Marine plywood sheets were placed over the peat for the machinery to drive on.

*Photos – Peter Bamess/Parks and Wildlife*

**Above** The peatlands of Lake Muir.

*Photo – Marie Lochman*

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**Ian Wilson** is Parks and Wildlife's Donnelly District nature conservation coordinator. He can be contacted on (08) 9771 7903 or by email ([ian.wilson@dpaw.wa.gov.au](mailto:ian.wilson@dpaw.wa.gov.au)).



## Focus on... Aboriginal tools

Aboriginal people are the traditional owners of Australia and have been hunting and gathering for tens of thousands of years. They make tools from things they source from the bush to help them fish, cook, catch animals for food, gather medicine and build shelter. Different Aboriginal language groups have different names for tools. Here are some examples:

**KNIFE** – this is one of the most versatile tools. It is used for hunting, skinning dead animals, gutting fish as well as gathering and preparing food. In Noongar country near Perth, a knife is known as a daarp. (Source: Parks and Wildlife Aboriginal Heritage Unit)

**SPEAR** – used for hunting and fishing, spears are made from single pieces of wood. In Yawuru country near Broome, a spear is known as a miliny. (Source: Yawuru Language Centre)

**SPEAR THROWER** – made of wood, the spear thrower acts as an extension of the user's arm to make the spear go further. It is lightweight and easy to carry, a very important tool for a hunter. In Miriuwung country near Kununurra, a spear thrower is known as a ngawaleng. (Source: Mirima Dawang Woollab-gerring Language and Culture Centre)

**AXE** – the head of the axe is made from stone attached to a strong stick with glue. The glue is made by melting grass tree resin, charcoal and kangaroo droppings over fire. Some uses for the axe are chopping wood and marking trees. In Bunuba country near Fitzroy Crossing, an axe is known as a jamayna. (Source: Marninwarntikura Women's Resource Centre)

**BOOMERANG** – mainly used for hunting, the boomerang is also used for ceremonies and making music. A boomerang can easily kill a small animal and knock down a larger one. In Noongar country near Perth, a boomerang is known as a kylie. (Source: Parks and Wildlife Aboriginal Heritage Unit)



Photos – Peter Nicholas/Parks and Wildlife

Find out more at [www.dpaw.wa.gov.au/parks/aboriginal-involvement](http://www.dpaw.wa.gov.au/parks/aboriginal-involvement)

## Kids... in the field

**BUSH RANGERS** love to get outdoors and experience new and exciting things. Esperance cadets recently hiked to the top of Frenchman's Peak in Cape Le Grand National Park. On the way, they checked whether walking route marker posts were in place, removed any rubbish left behind by other walkers, and observed wildflowers and lizards! For more info about the Parks and Wildlife *Bush Ranger* program visit [www.dpaw.wa.gov.au/get-involved/schools-programs](http://www.dpaw.wa.gov.au/get-involved/schools-programs).

**WHARNCLIFFE MILL** is a great place to explore some of the best mountain bike trails in WA. These three cool riders spent the day at 'The Pines' directly adjacent to the old Wharncliffe Mill going over easy road climbs, fast-flowing single-track descents, berms and fun table top jumps. Find out more about these trails at TrailsWA <http://trails.wa.com.au/trails/margaret-river-pines>.



Above Esperance Bush Ranger cadets.  
Photo – Esperance Senior High School

Left Margaret River Trail,  
Wharncliffe Mill.  
Photo – Sean Blocksidge

LANDSCOPE'S **KALEIDOSCOPE kids exploring nature** page is an exciting regular feature for kids. Find out about our national and marine parks and reserves, and what kids are exploring out in nature.



## Wedge-tailed eagles (*Aquila audax*)

Wedge-tailed eagles are thought to mate for life and incubate up to two eggs at a time, but usually only one chick survives. Chicks are reliant for food for up to six months and are fed native and introduced mammals and even some birds and reptiles. They leave their natal territory before the next breeding season and spend a few years wandering the landscape before being old enough to breed.

Illustration by Gooitzen van der Meer

Reference photo by Simon Cherriman



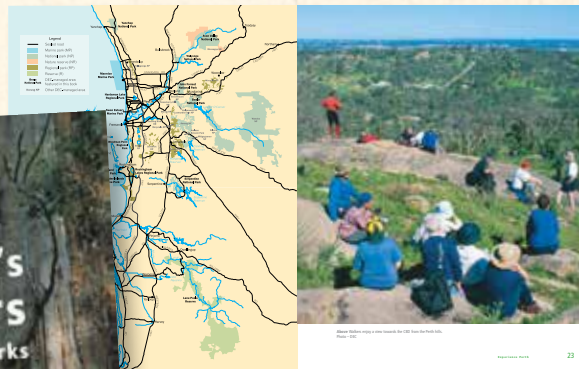
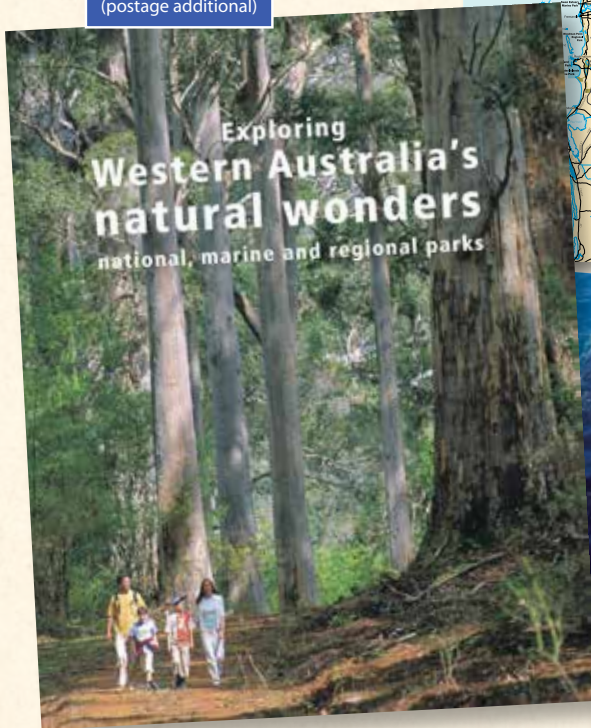
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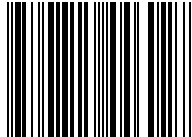


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