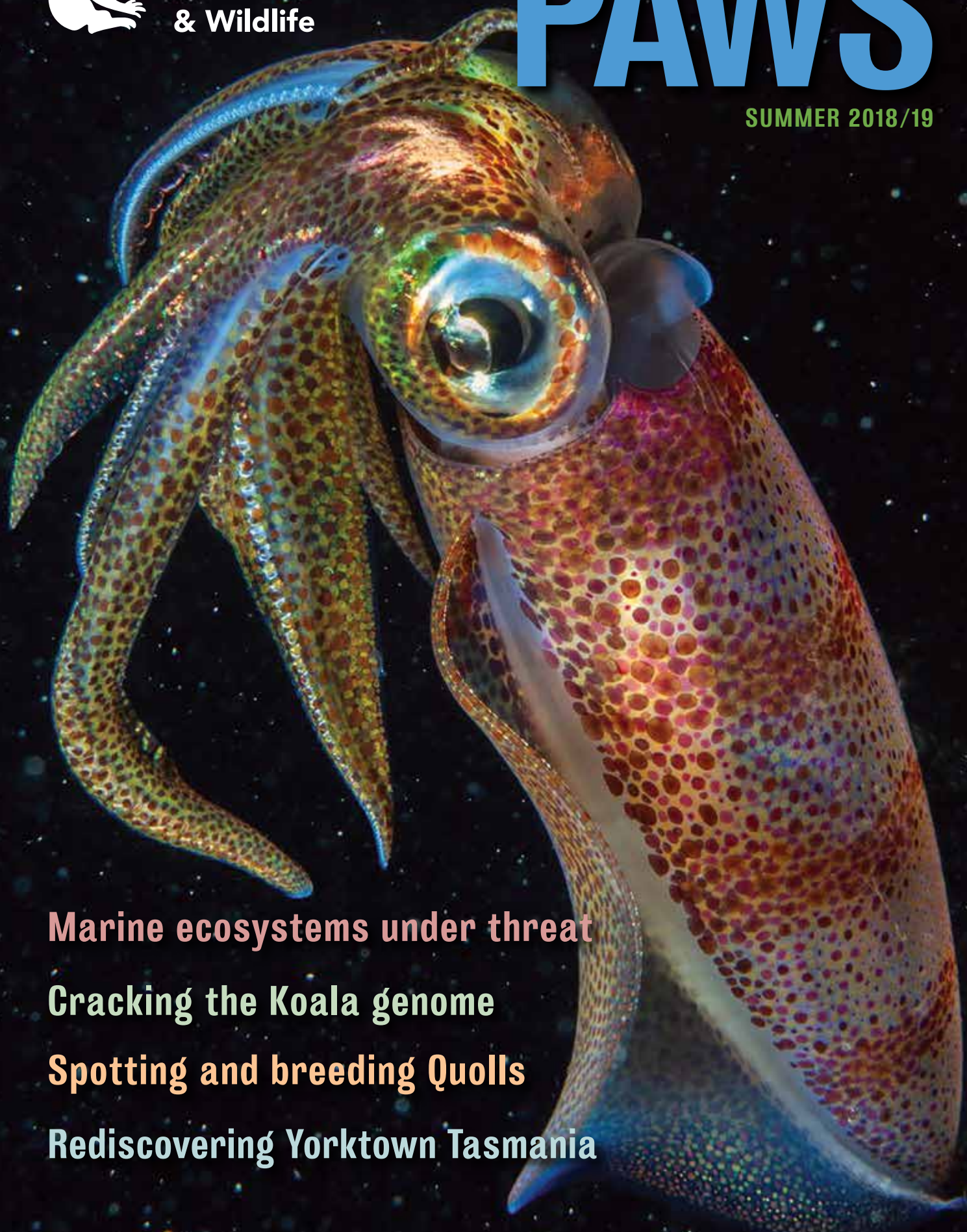




Foundation for  
National Parks  
& Wildlife

# PAWS

SUMMER 2018/19



**Marine ecosystems under threat**

**Cracking the Koala genome**

**Spotting and breeding Quolls**

**Rediscovering Yorktown Tasmania**



# CONTENTS



Baby quolls.

Page 3	CEO update
Pages 4/5	Marine conservation
Page 6	Backyard Buddies: Little Penguins
Page 7	Backyard Buddies: Bandicoot Superhighway
Page 8	Cracking the Koala genome
Page 9	Spotting and breeding Quolls on the East Coast
Page 10	Cultural Heritage: Yorktown, Tasmania
Page 11	Wish you were here
Back Cover	Marine inhabitants

FNPW would like to thank and acknowledge the following people for their written and photographic contributions to this newsletter: Julian Finn (Museums Victoria), Graham Chapman, C. Gillies, Blair Patullo, Grant Griffin, Jiri Lochman, WA DPAW, David Gray, Susan Park.

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*Front Cover : Southern Calamari Squid - a favoured food source of endangered marine species and humans. (Julian Finn - Museums Victoria)*

*Back Cover: Little Blue Penguins can dive up to 70 metres in search of food.*

*Green Sea Turtle resting on the ocean floor at Julian Rocks, Byron Bay. (Susan Park)*

## Foundation for National Parks & Wildlife

ABN 90 107 744 771

FNPW is the charity partner of Australia's National Parks. We're a non-government organisation on a mission to protect Australia's ecosystems and native species for generations to come.

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Thanks to your support we have added protected areas to National Parks in NSW and South Australia



**H**ello everyone and welcome to the Summer edition of PAWS.

Adding land to the National Parks of Australia is just one of the ways, albeit delivering a very important impact, the Foundation for National Parks & Wildlife protects and preserves wilderness and wildlife for future generations.

### Thank you for growing Woomargama!

In June we ran a campaign to raise the funds to buy 229 hectares of high conservation value land to add to the Woomargama National Park in southern NSW. I am delighted to let you know that the purchase of the property is now underway, and we will soon be able to announce the gazetting of this home for 25 vulnerable or endangered species to the National Parks of NSW.

Meanwhile, in South Australia, with the help of FNPW, the Government has just completed the incorporation of two further parcels of land into their National Parks.

Kangaroo Island's Cape Torrens Wilderness Protection Area has been increased in size from 940 hectares to nearly 1108 hectares. The extra land incorporates a significant proportion of the De Mole River, which provides a permanent wet, freshwater habitat supporting a diverse range of significant plants including the endangered *Triglochin procera* (Water-ribbons) Herbland ecological community.



Thurk Island in the Riverland, which is part of a nationally significant bio-region, is a 5.5-hectare island in the main channel of the River Murray. Its protection will secure nesting sites for the vulnerable Regent Parrot (left) as well as habitat for the Australian Darter, Blue-faced and Striped Honeyeater.

### 2018 Science Grants

The Paddy Pallin Foundation and the Foundation for National Parks & Wildlife have just concluded this year's round of grant assessments. Together we have agreed to fund four Science Grants. These grants will support field-based, high quality ecological

research. The objective of the grant program is to provide financial support for conservation-based research of Australian ecosystems, that will ultimately lead to tangible outcomes for management of these environments.

### Preserving Our Marine Environment

Summer is the time of year when many of us take a well-earned break at the end of a busy year and plan a holiday with our families. Lots of Australians will go to the beach or spend time close to our amazing coastline. Summer is also the time when FNPW traditionally asks its supporters, and their families and friends, to help us deliver conservation programs that will ensure the preservation of our unique marine environment.

Last year I took the opportunity to remind everyone about the catastrophic effects that marine debris is having on our ocean and its inhabitants. As a result of that appeal we were able to provide funding to help Tangaroa Blue with the terrific work that they undertake to free our beaches of debris. Specifically, FNPW funding has enabled them to employ a project officer to undertake data analysis that will enable the development of strategies to stop marine debris at its source.



This summer we are asking for your support to enable FNPW to continue funding research programs that will address the threats and pressures faced by Australia's unique marine ecosystems. You can read further about this initiative in the following pages of PAWS.

Thank you for caring about the environment and supporting FNPW's vital conservation programs. You make our work possible.

Wishing you and your loved ones a safe and happy Christmas and New Year.

Ian Darbyshire,  
CEO, Foundation for National  
Parks & Wildlife.





# Essential marine ecosystems under threat

Shellfish ecosystems were once common features in Australia's estuarine and nearshore marine waters, occupying an important ecological position in the marine ecosystem landscape alongside rocky reef, seagrass, mangrove, saltmarsh, coral reef and soft sediment ecosystems.

**D**evastatingly, the long-term harvesting and extraction of shellfish for food and the production of lime, has resulted in the degradation of these ecosystems and a decline in the environmental benefits provided by intact shellfish ecosystems, such as fish production, nutrient regulation and coastal protection.

The loss of shellfish ecosystems, in addition to the loss and degradation of other important marine ecosystems such as seagrass meadows, kelp forests, saltmarshes and mangrove forests, is a key driver in the long-term degradation of estuarine and coastal waterways, contributing to declines in water quality, fish production, blue carbon and coastal protection.

Fortunately, Australia is well equipped to reverse this decline, with a number of existing management

and policy tools available to help protect and restore shellfish ecosystems. Knowledge of the loss that has occurred, and its severity, is increasingly motivating restoration works through small to medium-scale on-ground works and research and development trials.

Projects are planned in all states (except the Northern Territory) and several have already been implemented with the assistance of private, government and non-government funding. A national network of practitioners, The Shellfish Reef Restoration Network, has been established to help support protection and restoration efforts.

There is growing recognition that protection of coastal ecosystems through international conventions and treaties is not enough. Active repair and restoration is also required for many marine ecosystems.

**In order to help enact protection policy and recovery plans, further research and information on the ecology, function and biodiversity of shellfish ecosystems is urgently needed.**

*Source: Gillies CL, McLeod IM, Alleway HK, Cook P, Crawford C, Creighton C, et al. (2018) Australian shellfish ecosystems: Past distribution, current status and future direction. PLoS ONE 13(2): e0190914. <https://doi.org/10.1371/journal.pone.0190914>*







## One big family

Southern Calamari play an important role in marine ecosystems both as predator and prey.

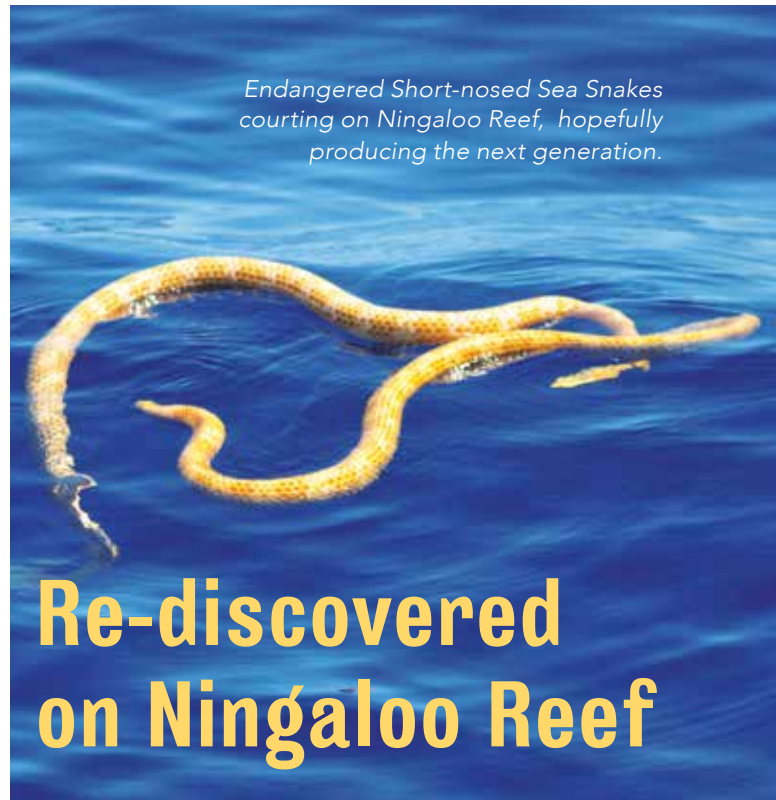
**F**ound only in southern Australia and New Zealand, the Southern Calamari Squid is an important food source for some of our most endangered species such as the Little Penguin, Australian Fur Seal and Sea Lion. With a short life span of less than a year, they spend the majority of this time close to the seagrass beds where they reproduce and lay their eggs.

Increased consumer demand and higher catch prices in recent years have led to this species being heavily targeted by both commercial and recreational fishers, leading to a concern that this might result in the removal of adults from the population before they could reproduce. This in turn would have knock-on effects to the predators that feed on them, causing the entire ecosystem to become unbalanced.

FNPW together with the Paddy Pallin Foundation funded a research project headed by Timothy Smith from Deakin University to help understand the genetic diversity and population structure of Southern Calamari spawning grounds across southern Australia.

After much sampling across seven locations, the study showed considerable species connectivity and low levels of genetic structuring, providing evidence that Southern Calamari spawning grounds consist of a mixture of individuals hatched from different locations. Stakeholders should therefore focus on managing these spawning areas to ensure that reproductive success is maintained, to allow dispersal and gene flow across sites.

Understanding patterns of dispersal and population connectivity are crucial for the management of species such as the Southern Calamari Squid, as it determines the scale at which stocks should be maintained and the ability of populations to persist over time should they become depleted or suffer significant loss of genetic diversity.



*Endangered Short-nosed Sea Snakes courting on Ningaloo Reef, hopefully producing the next generation.*

## Re-discovered on Ningaloo Reef

Thanks to funding from FNPW through the Paddy Pallin Science Grant program, two sea snake species previously thought to be extinct have been re-discovered.

**T**here are around 70 different species of sea snake and Western Australia hosts 22 species, of which five are endemic.

No sightings of the Leaf-scaled Sea Snake or the Short-nosed Sea Snake had been recorded since the late 1990s and they were presumed extinct.

Fortunately a profound and unexpected discovery in the lush seagrass beds of subtropical Shark Bay, some 1,400kms south of the snakes' only known coral habitat at Ashmore Reef, gives us another chance to protect these species we thought were lost forever.

Future research and conservation protection strategies will now include these seabeds, which demonstrates that reserves alone are not enough to prevent extinctions of species from human impacts.

### A STAR IS...EXTINCT

Vale the Derwent River Seastar. Known to have formerly inhabited the shores near the Tasman Bridge in Hobart, this exquisite creature has now, sadly, been documented as extinct.





**Backyard Buddies**  
An educational initiative of FNPW

# Looking after our littlest Penguins

Also known as fairy or blue penguins, Little Penguins are the smallest of the 18 penguin species worldwide. Vulnerable, isolated colonies are found in Australia's southern coastal regions, around Tasmania, and there is one remaining colony on SA's Granite Island.



**W**eighing just 1 kg and only 30–40 cm tall, Little Penguins are excellent swimmers, but like all penguins, cannot fly.

Nesting in burrows or among rocks, Little Penguins come ashore to breed, raise chicks and moult. Both parents feed and care for the young, who leave the nest at 7–9 weeks. They often have the same mate for life and live for up to 12 years.

You can see them from a boat, or as they swim and fish around the harbour or at the beach. And, if you're quiet, you can often hear them before you see them, calling with a short sharp bark, or even making growling noises.

But we can't take these unique birds for granted. Throughout Australia, **the survival of Little Penguins is something we can all support.**

It is important that we observe their personal space, especially around their burrows during breeding season.

Providing them with safe, quiet and easy access when they leave their burrows and head to the water to find food and back again is vital. As is keeping coastal waters healthy and clean so lots of seagrass can grow, attracting anchovies, pilchards, squid and krill - Little Penguins favourite food.



## How you can help Little Penguins on land and in the water this Summer:

- Watch penguins from a safe distance, so you don't disturb them.
- Keep your dog away from where penguins live and all protected areas.

- Keep your cat inside at night.
- Reduce the amount of light and noise you make near penguin colonies both on land and on the water.
- When in Little Penguin territory, check under your car for penguins before you get in, and drive slowly near foreshores.
- Never put oil or chemicals down the drain.
- Maintain your boat to help stop fuel and oil leaking into the water.
- Reduce boat speed to 4 knots or less near penguins.
- Never moor or anchor your boat close to the shore where penguins make their nests.
- Never discard fishing hooks or line on the beach or in the water - these can strangle Little Penguins or injure their flippers and feet.
- **Take all your rubbish home with you and dispose of it responsibly.**

Since 1999, FNPW has assisted the conservation of the **Manly Little Penguins**. This support includes microchipping and monitoring the penguins and checking their burrows, as well as providing funding for the building and installation of new nestboxes.

Additionally, FNPW has supported the volunteer Penguin Wardens at Manly by providing equipment and all-weather jackets for their nightly watches over the colony during the breeding season. The wardens ensure dogs, humans and other threats don't encroach on the vulnerable penguin nesting sites, and frighten them into abandoning their chicks and eggs.

**Thanks to all these efforts, the Manly Little Penguins' breeding success has improved.**



# Little Diggers on the road to recovery

There were once eight species of bandicoot living in southern Australia...now there's just one - The Southern Brown Bandicoot



**T**ogether with the University of Adelaide and the Sturt Upper Reaches Landcare Group, FNPW is planning to build a 5km 'Bandicoot Super Highway' in the Mount Lofty Ranges, east of Adelaide. The goal is to link three isolated populations and protect the dwindling Southern Brown Bandicoot population, an endangered Australian marsupial.

Bandicoots play a very important role in the health of soil - they excel at digging. In fact, a Southern Brown Bandicoot can excavate over 3.9 tonnes of soil per year! That digging aerates the earth and brings deep soils and their nutrients to the surface. These 'ecosystem engineers' mix and trap organic matter and other materials, increasing nutrient turnover.

They also break through hard soils, which would otherwise be impenetrable to plant seedlings... and they provide sites for water to enter the ground, increasing soil moisture.

Finally, as bandicoots dig for their preferred food of fungi and insects, they distribute spores of critical fungi across the landscape. These fungi in turn, help native plants to increase their absorption of nutrients and to deal with our nutrient-poor Australian soils. That's just one important job that's falling by the wayside as our Little Diggers decline in number.

Southern Brown Bandicoot numbers are decreasing due to fires, predators and, most significantly, habitat

loss which is of great concern, as a single bandicoot needs between one to six hectares of habitat to thrive. With vegetation clearing, and fragmentation, bandicoot populations are becoming more isolated which makes them more vulnerable to other threats.

Providing a safe environment between isolated bandicoot populations is a first step in creating the Bandicoot Super Highway.

In areas with a shortage of native habitat, Bandicoot Bungalows have been constructed from pallets, to provide the Southern Brown Bandicoot with a home base and stepping stones into new territory, using branches, grass and sticks on top to provide dense shelter.

Once completed, the Bandicoot Super Highway will feature underground tunnels to avoid roads, and will link natural habitat areas that the bandicoots can use to live in or hide from predators such as foxes.

**The Bandicoot Super Highway is expected to take approximately three to five years to complete.**

*Right:  
Constructing  
Bandicoot  
Bungalows  
from recycled  
pallets,  
branches,  
sticks and  
grasses.*



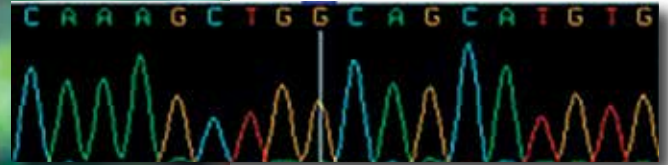
*Far right:  
The finished  
shelter - ready  
for visitors!*



**To sign up for a regular Bmail newsletter  
from Backyard Buddies go to:  
[backyardbuddies.org.au](http://backyardbuddies.org.au)**



# Cracking the Koala genome



One of the most threatening processes to koala survival is loss of habitat through land clearing and urbanisation which results in a reduction of habitat connectivity, reduced genetic diversity and puts koalas at high risk of inbreeding.

"For the first time, using over 1000 genome linked markers, we are able to show that NSW and QLD populations show significant levels of genetic diversity and long-term connectivity across regions." Professor Johnson said.

A team of Australian and international scientists has made a significant break-through successfully sequencing the full koala genome.

**L**ed by Professor Rebecca Johnson, Director of the Australian Museum Research Institute (below left), and Professor Katherine Belov, University of Sydney (below right), the sequence is considered to be the most complete marsupial genome sequenced to date. In terms of quality it is on par with the human genome.

The highly accurate genomic data will provide scientists with new information that will inform conservation efforts, aid in the treatment of diseases, and help to ensure the koala's long-term survival.

"The Koala Genome Consortium has been an ambitious journey affording us great insights into the genetic building blocks that make up a koala – one of Australia's, as well as the world's, most charismatic and iconic mammals," Professor Johnson said.

"This milestone has come from our vision to use genomics to conserve this species. The genetic blueprint has not only unearthed a wealth of data regarding the koala's unusual and highly specialised diet of eucalyptus leaves, but also provides important insights into their immune system, population diversity and the evolution of koalas," she said.

**"Ensuring this genetic diversity is conserved in concert with other conservation measures to protect habitat, reduce vehicle strikes, dog attacks and disease, are the keys to the long-term survival of the koala."**

**FNPW is a proud funding partner of the Koala Genome Consortium.**





# Spotting and breeding Quolls

Quolls are Australia's only native carnivorous marsupials and are a key species, as they play an important role in maintaining the ecosystem.

**N**atural predators and carrion eaters, quolls aid in the control of small mammals (such as rabbits), keep the environment clean and maintain a balance in the bush.

Once, most parts of Australia were inhabited by at least one of the four species of quoll, but since European human settlement, their decline has been dramatic.

Due mainly to habitat loss and introduced predators such as foxes and cats, now the Spotted-tail, Eastern and Northern Quoll are all listed nationally as Endangered, and the Western Quoll is listed as Vulnerable.



The Spotted-tailed Quoll (aka Tiger Quoll) is the largest native marsupial carnivore left on the Australian mainland. Sadly, its population has declined to the point where it now occupies just 50% of its original pre-European range.

In southern-NSW, the quoll's status is mostly uncertain, particularly away from major expanses of timbered country including Kosciuszko National Park and along the coastal escarpment.

FNPW funded a project aimed at monitoring the distribution of the quoll on private land in this region. Using camera trap stations associated with bait lures, surveys for quolls were undertaken across a range of habitat types on 23 properties around the Monaro Tablelands.



Overall, 178 camera traps were deployed and Spotted-tailed quolls were recorded from approximately 30% of camera stations on nine properties, the majority of which were deployed at the southern end of the Monaro along the Snowy River corridor.

In contrast, introduced predators were more widely seen across deployment sites: the red fox was detected at over 60% of camera trap sites and the feral cat at around 15% of camera stations.

The plan now is to implement integrated fox and cat control, combined with improving vegetation corridors in areas with little native vegetation cover, which it is hoped will improve quoll survival around the Monaro.

Meanwhile, in NSW's Barrington Tops region, FNPW has contributed funds to Aussie Ark to establish an 'insurance population' of Eastern quolls.



The Eastern quoll is smaller than the Spotted-tailed Quoll and is distinguished by the absence of spots on its tail, only four toes on its hindfoot, and a less bulky head shape.

Eastern quolls once inhabited most of Southeast Australia from the east coast of South Australia through Victoria and up to the central coast of NSW.

It is believed that the Eastern quoll became extinct on the mainland in 1963 due to the introduction of the red fox and feral cats, yet they survive in Tasmania without these predators.

**Continued conservation efforts will help quash the decline of quoll quantities across Australia**



**You can help protect Australia's threatened quolls by donating at:**  
**[fnpw.org.au](http://fnpw.org.au)**



# Visitors welcome pathway to Tasmania's past

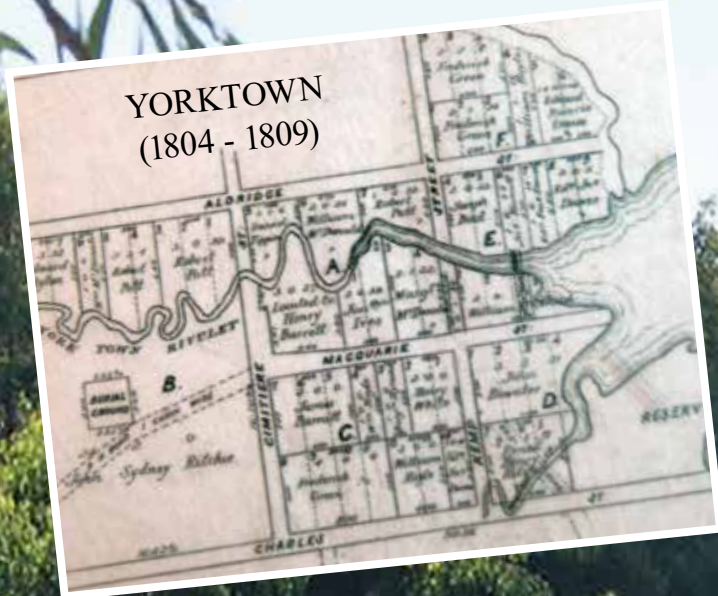
Yorktown is one of Tasmania's earliest European settlement sites and now thanks to volunteers and funding from FNPW the cultural values and native flora and fauna have been restored for all to enjoy.

Settled in 1804 and abandoned a few years later, Yorktown is now recognised and on the Tasmanian Heritage register. In 2000 most of the site was overgrown with the perennial, invasive weed - gorse. Dedicated volunteers have been working to remove the gorse, re-establish the native flora on the site and provide a pathway for visitors to walk.

Several threatened species inhabit the area and a significant bird list has been recorded. The new plantings not only give protection and nesting sites to the birds and animals, but shade the ground and discourage seedling gorse.

With financial support from FNPW on-going work to re-establish more areas of native heathland vegetation and provide welcome, directional signage, new historical information and interpretative signage, as well as a visitors book post, has been possible.

**The natural values are being  
returned by bringing back heathland  
and bushland for local birds and  
threatened species**



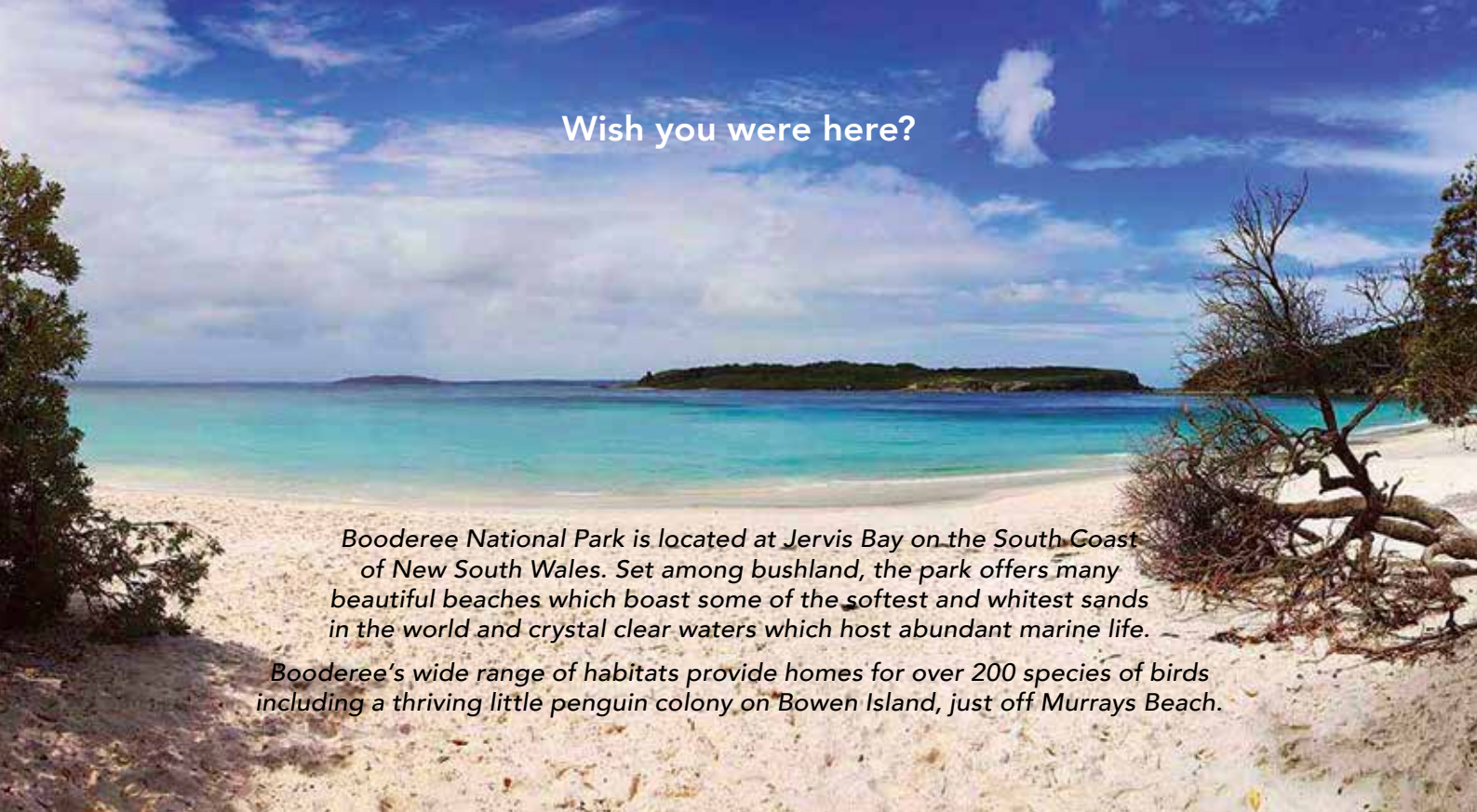
Signs which acknowledge the contribution of the Foundation for National Parks & Wildlife are well placed and the new visitors book box has received many complimentary comments regarding the work carried out.

The number of visitors to the area continues to grow, particularly following the archeological digs that have discovered more building sites from 210 years ago that have attracted local publicity.

**Information for visitors regarding the natural values and also their history encourages the celebration of our cultural heritage.**







Wish you were here?

*Booderee National Park is located at Jervis Bay on the South Coast of New South Wales. Set among bushland, the park offers many beautiful beaches which boast some of the softest and whitest sands in the world and crystal clear waters which host abundant marine life.*

*Booderee's wide range of habitats provide homes for over 200 species of birds including a thriving little penguin colony on Bowen Island, just off Murrays Beach.*

Booderee's wide range of habitats provide homes for over 200 species of birds including a thriving little penguin colony on Bowen Island, just off Murrays Beach.

**FNPW needs your urgent help to continue our vital work. Please donate today.**

**Thank you for your  
donation and  
ongoing support.**





**Foundation for  
National Parks  
& Wildlife**

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with your family, friends and community.

Thank You.