AUSTRALIAN Wildlife

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Celebrating a new century of wildlife preservation in Australia

Journal of the Wildlife Preservation Society of Australia Limited
(Founded 1909)

SHOREBIRDS OF TOONDAH HARBOUR

PHOTOGRAPHY BY CHRIS WALKER

More images and information on Toondah Harbour, go to page 10

On the Toondah tidal flats a grey-tailed tattler perched on a rock watches a bar-tailed godwit feeding.

Wood ducks and ducklings, Cleveland.

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Suzanne Medway AM
Editor, Australian Wildlife

Sabine Borgis
Sub-Editor, Australian Wildlife

On the cover:

Front Cover: Brown thornbill next to the Eddie Santagiuliana Way boardwalk in Cleveland.

Back Cover: Great egret (left) and cattle egret in breeding colours (right) roosting in a tree at Redland Bay.

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

Australian Wildlife

is the official journal of the Australian Wildlife Society (Wildlife Preservation Society of Australia Limited).

Founded in 1909, the Society is dedicated to the conservation of our unique Australian wildlife in all its forms.

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Directors 2018

Notice to our members

The Australian Wildlife Society (Wildlife Preservation Society of Australia Limited) is managed and controlled by an elected board of ten volunteer directors. The Society is a registered company limited by guarantee with ASIC and is responsible for complying with all its regulations.

Any member who might like to consider serving as a director of the Society is invited to contact the national office for more details. The most important qualification to serving as a director is 'a commitment to and love of Australian wildlife'.

The Society holds regular monthly meetings on the first Wednesday of each month in Sydney.

The Editor would like to feature a member's profile in the fortnightly email newsletter and occasionally in our quarterly magazine. Members are invited to consider submitting a short article with a photograph for possible publication.

Our Mission

The Australian Wildlife Society (Wildlife Preservation Society of Australia Limited) is an independent, voluntary, non-profit conservation organisation, formed in 1909, and is committed to the preservation of Australia's precious flora and fauna. We act as a watchdog and provide advice to government agencies and institutions regarding environmental and conservation issues concerning all aspects of wildlife preservation. Our mission is to conserve Australia's fauna and flora through education and involvement of the community. We are dedicated to the conservation of our unique Australian wildlife in all its forms through national environmental education programs, political lobbying, advocacy and hands on conservation work.

Our Society has always known that a conservation battle is never really won until the victory is enshrined in legislation. We have always tried to convince politicians of the necessity to include the preservation of Australia's precious wildlife and its vital conservation habitat in all their planning and environmental issues and discussions.

From the President's desk

Suzanne Medway AM - President

Throughout our world's oceans lurks a silent killer. The killer is plastic, and it's on a beach or floating in an ocean near you.

More than 268,940 tonnes of litter is estimated to be floating in the Earth's oceans. Eighty percent of this plastic on our coast and in our waters is being generated from land. Litter is often lost or blown from inland, comes through stormwater drains or is thoughtlessly dropped.

Once plastic is in the ocean, marine animals are suffering from either becoming tangled up or eating it leading to suffocation and starvation. Plastic has a long legacy too, breaking down into smaller and smaller unidentifiable pieces and lasting thousands of years.

Incredible amounts of easily recyclable plastic bottles are washing out of stormwater drains. There is more plastic waste than plankton in the Pacific Ocean, and it's estimated there will be more plastic than fish in the world by 2050!

Plastic bags and microplastic, in particular, are mistaken for jellyfish and fish eggs, which are not a tasty, let alone nutritious, diet for the animals that eat them.

Mass release of helium balloons

I first met Lance Ferris in September 2002 in a seaside park in Ballina. I had heard about a retired police officer who jumped into the water to rescue injured pelicans. Lance founded Australian Seabird Rescue (ASR) in Ballina, New South Wales, in 1992.

We were travelling north from Sydney and decided to stop in at Ballina to find and meet Lance, who had just returned from rescuing a young osprey that had fallen from its nest. Right from the start, we realised that here was an enthusiastic and committed wildlife conservationist. This was the beginning of a special friendship. I came to admire Lance more and more, and often turned to him for advice and inspiration.

As well as his rescue work of seabirds, Lance was particularly passionate about the danger of plastics in the environment to native wildlife. He was particularly distressed about the plight of marine turtles and the devastation being inflicted on them by the mass release of helium balloons and plastic litter in our oceans.

Our Society and Lance through ASR worked on joint projects to reduce the amount of plastic bags being dumped in the environment and banning the mass release of helium balloons. We launched a campaign to lobby the Queensland government as a local school had decided to release hundreds of balloons to celebrate its centenary. We emailed everyone on our contact list asking them to address an email to Queensland MPs. In a very short space of time, I received emails and letters from concerned members of the Australian public, which were then forwarded to the Queensland government asking it to consider banning the mass releases of helium balloons in Queensland. The school came to its senses and did not release the balloons.

Dumping of balloons into the environment, whether it is on the ground or in the air, is not only littering but presents a hazard to marine creatures who mistake these items for food. The 'jet-stream' air-flow across the continent is from west to east. Helium balloons are thus likely to reach the height of the jet-stream and eventually find their way into the ocean. Whether it goes up or down, it is litter and can contribute to the deaths of marine creatures.

The law does not differentiate between different types of littered material and whether the waste is biodegradable or not. The release of single or multiple balloons can constitute either littering or illegal dumping depending on the volume of material released.

Lance Ferris leaping onto an injured pelican at Hastings River in New South Wales

Fortunately, since then many other conservation groups have joined the fight to ban the mass release of helium balloons, and in December the Queensland government posted on its website:

> **Releasing balloons is littering**
>
> In Queensland, the release of balloons into the environment is considered littering under the Waste Reduction and Recycling Act 2011—whether released deliberately or by accident.
>
> While a person may have the permission of the occupier of a place to release a balloon, once the balloon leaves that place it becomes litter.

Recently I lobbied Mr Allan Piddington, Senior Vice-President of the Australian Funeral Directors Association to join our campaign to ban the release of all helium balloons at funeral services. Mr Piddington replied that he would be interested in informing the funeral directors in Australia of the danger to Australian wildlife that happens with the mass release of helium balloons and we recently had an article on this subject appear in their magazine.

I also wrote to Ms Fiona Simson, President of the National Farmers' Federation asking whether that organisation might be interested in joining our campaign to ban the release of all helium balloons as there is considerable information from Australia and overseas sources that support the fact that Australia's native wildlife, domestic animals and farm animals are at risk from swallowing these balloons. Ms Simson has not had the courtesy to reply.

In Victoria, the Melbourne Cricket Ground has banned the mass release of balloons.

Plastic drinking straws

Over eight million tonnes of plastics enter the world's oceans every year. However, some plastic items are worse than others.

Single-use plastic is a particularly nasty form of plastic. These items have a shockingly short lifespan, normally used once and then discarded to landfill. Like other plastics, they never biodegrade and take hundreds of years to break down. Plastic drinking straws are one such single-use item and are ending up in our oceans by the thousands.

Plastic straws made the 'top ten' items picked up on beach clean-ups, and it's not hard to see why.

Why are straws so damaging to the marine environment? Disposable straws are usually made of plastic and plastic never breaks down. As time goes by, plastic will separate into smaller and smaller pieces, but never completely biodegrades. Plastic is quickly transforming our oceans into plastic soup. We use straws for around twenty minutes before we toss them away, which is an astonishingly quick lifespan for an item that will be on the planet forever. Straws also contain BPA and can't be recycled.

It can be hard to see how using one plastic straw is going to cause huge amounts of damage to the environment, but let me put it into context for you. Recently a team of scientists in Costa Rica came across an endangered species of sea turtle with what they thought was a parasitic worm blocking its airway. They realised it was a plastic straw. Hours from veterinary help, the scientists successfully dislodged the straw themselves and released the turtle back into the ocean.

Making a connection between our actions and the often devastating outcomes they can have on the environment can act as a catalyst for change.

The simplest way you can eradicate straws from your life is just to stop using them at home. It's as easy as that. When you're out and about, things can get a little trickier. Cafes and restaurants are becomingly increasingly conscious of environmental issues, so creating a dialogue with your local barista or barman around the problem of single-use plastic is the first step towards initiating change.

There are plenty of alternatives to disposable plastic straws available. Many retailers today stock glass, stainless steel, paper or bamboo straws.

Educating your friends and family about how silly straws truly are will help motivate them to make the switch to straw-free. You can use the line "That straw could end up in a turtle's nose!"

Saying no to straws seems like such a simple action, and it is. But actions like these do make an enormous difference to our environment.

Single-use plastic bags

Single-use plastic bags will soon be banned across Victoria. The state government has committed to outlawing plastic bags following the lead of supermarket giants Coles and Woolworths who announced their own bans late last year. The state government is holding a three-month consultation process with businesses and the community on how to implement the ban.

It starts with you

We can turn the tide on plastic pollution – there are so many small behavioural changes that can make a huge difference for our oceans and the amazing life that calls them home.

It is important to remember that every single person can have a positive influence on our oceans and environment.

These simple steps, once implemented, will help stop the biggest sources of plastic pollution from reaching our oceans and harming our marine life:

- Ban the bag in your life. Take your own non-plastic bags wherever you go and refuse to use single-use plastic bags. Going shopping? Have them waiting in the back of the car. Keep forgetting to put them in your car? Hang them on your front door handle, then next time you're heading to your car take them with you.
- Use your own reusable drink bottle or coffee cup. Prevent plastic bottle pollution and waste by purchasing a long-life reusable drink bottle or 'keep cup'. Keep them in your bag or at work, then when you're out and about you'll be both versatile and environmentally friendly.
- Steer clear of products with microbeads.
- Say no to plastic straws in your drinks.

To stop plastic pollution, we need to approach this from both a personal and a political angle.

We need to make the change in our own lives, and also demand that every government around the country supports us in doing so by implementing appropriate bans and legislation ensuring big polluters stop their toxic tide of plastic pollution. Let your local MP know they have to support you by doing the right thing!

109th Annual General Meeting

The 109th Annual General Meeting of the Wildlife Preservation Society of Australia Limited trading as the Australian Wildlife Society was held on Wednesday 7 March in Sydney. The membership of the Society was well represented, with 20 members attending.

Suzanne Medway, President, tabled the Annual Report for 2017 and highlighted the Society's achievements in wildlife conservation over the past year. The full report is featured in this magazine.

The audited Treasurer's Report for 2017 showing a strong financial balance was tabled and adopted by the meeting.

John Dickie and Co, CA Registered Company Auditor, was confirmed as the Society's auditor for 2018.

The election of the directors to sit on the board for the coming year took place, and the following were elected to join the other seven directors remaining on the board:

Sash Denkovski
Ken Mason
Philip Sansom

2018 Board of Directors L to R: Front row - Ken Mason, Clive Williams Chrissy Banks, Suzanne Medway, Patrick Medway and Noel Cislowski. Back row - Philip Sansom, Wayne Greenwood, Sash Denkovski, Stephen Grabowski and Trevor Evans.

Philip's qualifications are:

Philip Sansom, Emeritus Mayor, Dip. Art Ed., Grad. Dip. Arts, M.Ed., MAICD.

As well as formal qualifications in Visual Arts and Creative and Performing Arts and teaching experience, Philip has extensive experience on various board appointments, committees and in local government. He was a Councillor (and Emeritus Mayor) on Hurstville City Council from September 1991 to May 2016, Mayor on three occasions and a member of the Implementation Advisory Committee after Hurstville and Kogarah were amalgamated until August 2017. Philip trained as a high school art teacher and spent 25 years teaching, 19 years as Head Teacher of Expressive and Performing Arts Departments. The last 12 years he was in non-teaching positions within the NSW Department of Education in the areas of Industrial Relations and Employee Performance and Conduct as a Senior Project Officer. Philip was chair of the Sydney Metropolitan Catchment Management Authority (SMCMA) 2008 to 2011; a government authority with a multi-million dollar budget and full-time equivalent staffing of more than 30. He currently chairs the Australia Day Botany Bay Regatta Committee and is a Director of St George Basketball Association and Shopfront Arts Co-Op.

Philip has retired from full-time work now and is doing community work through the Lions Club of Lugarno and board involvements.

Suzanne Medway presenting retiring director Noel Cislowski with Honorary Life Membership.

Suzanne Medway presenting Robin Crisman with her 2017 Community Rehabilitation Award.

He has also held the following positions: Deputy Chairman, Cooks River Alliance (2011-2015); member, NPWS Metro South West Region Advisory Committee (2000-2015); Commonwealth Government Advisory Grant Assessment Panels in Natural Resource Management; Sydney South Joint Regional Planning Panel (JRPP).

Honorary Life Membership

At the conclusion of the AGM, Suzanne Medway presented Noel Cislowski with Honorary Life Membership, upon his retirement from the board, for his outstanding contribution as a board member over the last 15 years. He will be greatly missed at the regular board meetings.

Dr Clive Williams, Chairman of the judging panel, announced the Society Awards for 2017.

2017 Serventy Conservation Award

The award for 2017 was presented to Jennie Gilbert. Jennie has devoted her life to caring for all animals, but for her, there is nothing more rewarding than watching a healthy sea turtle swim its way to freedom. The co-founder of the Cairns Turtle Rehabilitation Centre (CTRC), Jennie, along with her dedicated team of volunteers, has helped nurse hundreds of sick and injured reptiles back to health over the past 20 years, releasing them back onto the Great Barrier Reef with satellite trackers attached to monitor the success of the release. CTRC treats injured and sick marine turtles brought in from the Great Barrier Reef and the Cape York Peninsula, with more than 170 sick and injured animals brought in for treatment over the past 20 years. Jennie attends James Cook University for important research on sea turtles. This research is not confined to turtle health but also into turtle movements using satellite tracking, nesting sites and breeding patterns. She shares the knowledge gained from autopsies and turtle injuries with other rehabilitation centres both national and international. It is fair to say that Jennie has become an outstanding expert on turtles, but she doesn't just study them and learn about them, she applies her knowledge to their conservation with a devoted hands-on approach.

In 2010 the Australian Wildlife Society donated fund to purchase an endoscope to aid Jennie in her treatment of turtles suffering from 'floaters' disease'. This disease causes air to be trapped between the shell and body impacting the animal's ability to dive and feed itself. If left unaided the animal will eventually either starve to death or become easy prey for larger predators such as sharks or crocodiles.

Jennie Gilbert at Cairns Turtle Rehabilitation Centre.

Jennie Gilbert

Acceptance speech from Jennie Gilbert

> Thank you to Australian Wildlife Society for this award. It is humbling to receive the Serventy Conservation Award on behalf of the wonderful animals I work with. The work that I do at Cairns Turtle Rehabilitation Centre is a passion as much as it is a necessity. Over the past 18 years that I and many dedicated volunteers have contributed to the rescue, rehabilitation and release of marine turtles we have seen a lot of success and it is rewarding that we can contribute to the ongoing preservation of marine turtles. The Seventy Award is a fantastic acknowledgement of the dedication to preserving the life of many sick and injured turtles. Thank you.

2017 Community Conservation Award

The award for 2017 was presented to Port Stephens Koala and Wildlife Preservation Society, who have been operating in the Hunter region of NSW for 40 years. This society is well established and well known in its local area. The group has built up a magnificent set of statistics on koala rescues and has been able to demonstrate conclusively the decline in the local population. This has led to efforts to have the local koala population classified as Endangered by the NSW Scientific Committee. The group has worked closely with the local council, with schools and with the University of Newcastle. Statistics provided by the group enabled a University of Newcastle legal team to stop the development of ecologically sensitive land in the Fishermans Bay area. This society is not just content to rescue and rehabilitate injured koalas, but over its 30-year history, it has campaigned to protect their environment and to influence policies which affect their welfare.

Acceptance speech from Alison Blanch, Director and Promotions Officer, Port Stephens Koalas

> Port Stephens Koalas are honoured to accept this prestigious award and thrilled that our group has been recognised as contributing to wildlife conservation. Being volunteers and relying on donations and grants to care for our koalas in the Port Stephens area has never been easy, but we are determined to keep going and make a difference. Many thanks also go to our members, who are our greatest asset, all volunteers and passionate about conserving our koala population. We have a clear vision of creating a world-class hospital facility for our local koalas, and we are pleased this will become a reality this year, along with a tourist facility and shop. The prize money associated with this award will certainly be put to good use. Thank you.

2017 Community Rehabilitation Award

The award for 2017 was presented to Robin Crisman. Robin is a Doctor of Veterinary Medicine with additional degrees in Veterinary and Biomedical Science. Robin has practised for over 25 years, and in that time her work has included veterinary care of wildlife at Blackbutt Reserve and Australian Walkabout Wildlife Park. After raising her first joey, she was driven to learn more about all native animals and their care. She wanted to learn about conservation measures to help save species, especially wombats. Robin joined Roz Holme in establishing the only wombat-dedicated hospital at Cedar Creek Wombat Rescue. Robin also has a lengthy association with the Nature Animal Trust Fund facilitating wildlife rescue and rehabilitation.

Robin's devotion to animal care and her passion for veterinary excellence makes her a worthy recipient of the 2017 Community Rehabilitation Award.

Acceptance speech from Robin Crisman

> Thank you to Australian Wildlife Society for this award. It's very humbling to receive recognition for something I truly love doing. As both a veterinarian and licensed wildlife rehabilitator, I am very fortunate to work with our amazing native animals on a daily basis. We are so lucky in Australia to have such a diverse and unique population of wildlife. It's important that we do all we can to preserve it.

Annual Luncheon

The Annual Luncheon was held after the Annual General Meeting in Cellos Restaurant at the Castlereagh Inn in Sydney.

Robin Crisman

Back row L to R: Murray Black, Data Manager; Kate King, Hospital Coordinator; Tolley (koala); Di Lucas, Volunteer; and Di Kerswell, Volunteer.
Front row L to R: Carmel Northwood; President; and Alison Blanch, Director/Promotions.

Shorebirds of Toondah Harbour

Chris Walker

At the Toondah Harbour ferry terminal, passengers bound for North Stradbroke Island queue patiently. A trip by water taxi takes about 25 minutes, and vehicular ferries take nearly an hour. North Stradbroke Island is a subtropical island located 30 kilometres southeast of Brisbane, Queensland, and it is the world's second largest sand island: about 38 kilometres long and 11 kilometres wide!

Nearby are shorebirds, in various shades of brown. They feed on the muddy tidal flats and seagrass beds when the tide is out and roost in a long line on a sandbank near the ferry channel when the tide comes in. Most plentiful are bar-tailed godwits, but the mix regularly includes eastern curlews, grey-tailed tattlers and an occasional whimbrel.

As they wait to embark on their short journey to the island, most ferry passengers are unaware that most of these shorebirds are preparing for their journey. Some of them will soon be flying almost halfway around the world to their breeding grounds in the Arctic circle. They depart each year in April/May and return in September/October. Records kept by the Queensland Wader Study Group show that the same birds return to the same feeding areas year after year.

Flagged Bar-tailed godwit BTK has been seen in the proposed Toondah Harbour development area more than once. She was sighted just north of the ferry terminal on 15 March 2016 a few weeks before the godwits went on their 2016 overseas trip. A few months and thousands of kilometres later BTK was sighted on mudflats next to the

Above: Bar-tailed godwit

Toondah Harbour ferry terminal, on 24 December 2016.

Another flagged godwit BAK, often sighted at Oyster Point near Toondah Harbour, was recorded at Arao in Japan in April of 2013, 2015 and 2016.

Right now, in March 2018, migratory shorebirds are feeding frantically at Toondah to build up vast energy reserves for their long flight north. They can be seen probing and prodding in the soft mud looking for small crabs and shellfish. It's quite normal to see a godwit's long bill and head completely disappear as it digs deep for its next morsel.

The environmental significance of Moreton Bay's shorebirds was recognised 25 years ago when the federal government listed most of the southern Bay as an internationally protected Ramsar site.

The federal government has also signed agreements with China, Japan and South Korea to protect migratory shorebirds. In recent years conservation listings under Australia's *Environment Protection and Biodiversity Conservation* (EPBC) *Act* have designated the bar-tailed godwit as Vulnerable and the eastern curlew as Critically Endangered.

A major threat to Toondah Harbour's shorebirds is a plan supported by the Queensland Government and the local Redland City Council which would allow a preferred property developer, Walker Group Holdings Pty Ltd, to dredge and reclaim many hectares of Ramsar-protected wetlands for construction of a 400-berth marina and 3,600 apartments.

The proposal was referred to the federal government for environmental assessment in May 2017 attracting 1,411 submissions opposing the project and only eight submissions in favour. Many months later, the government still hasn't decided how to assess the project's environmental impacts.

Meanwhile, the ferries keep servicing North Stradbroke Island, and the shorebirds get ready for their next overseas trip.

Chris Walker is a photographer with a special interest in the wildlife of Redland City which includes migratory shorebirds and koalas. He publishes his work under the name "Wild Redlands" on a range of social media.

Bar-tailed godwit BTK at Oyster Point near Toondah Harbour.

Grey-tailed tattler wading on the Toondah tidal flats.

Critically endangered Eastern curlew roosting at Oyster Point near Toondah Harbour.

SOPHISTICATED COMMUNICATION
DISCOVERED IN A SMALL AUSTRALIAN BIRD

Maria Ter-Mikaelian

A small native Australian bird can do what few animals can: it can use different 'words' to warn its flock about different kinds of danger. That bird is the noisy miner – an underappreciated, and sometimes downright maligned, honeyeater with a surprisingly complex social system.

When a noisy miner spots an airborne predator, such as a flying raptor, it produces a high-pitched alarm call that tells other noisy miners to freeze or escape. However, if predators are spotted on land or on a perch, the same bird makes a harsh, low-pitched call, mobilising its flock to watch and often to mob the predator – in other words, to join forces in harassing and attacking the intruder until it gives up the hunt.

Of course, many animals produce alarm calls that warn other members of their species of imminent danger. What makes the noisy miners' behaviour so special is two-fold. First, noisy miners consistently use two distinct calls to announce different types of threats. This is similar to shouting, "Fire!" or "Burglars!" rather than simply yelling, "Danger!", as most animals do. Second and more important, the noisy miners who hear these calls respond accordingly, even if they cannot see the predator themselves – just as a person might lock the door and hide after hearing "Burglars!", but not after hearing "Fire!" This type of sophisticated warning system is what animal behaviour scientists call a 'functionally referential' system, and so far, it has only been demonstrated in a small number of species, including some primates, mongooses, meerkats, and fewer than a dozen birds. This year, noisy miners join this select group, thanks to two scientific studies independently conducted at the University of New England (UNE) and the Australian National University (ANU).

According to Dr Paul McDonald, the lead investigator of the study at UNE, the social organisation and vocal communication of noisy miners is surprisingly similar in complexity to species like dolphins and humans. "Here we have a small bird that's only 60 grams, yet it is capable of having this referential system," he says. "There is a lot going on in people's backyards that they may not be aware of."

As often happens with animal behaviour research, while the idea of referential alarm calls is deceptively simple, conclusively proving that it occurs in noisy miners was no easy task. The most difficult thing about studying birds in the wild, says Paul

Above: Noisy miners have a rich vocal repertoire. Photo: Lucy Farrow

McDonald, is "being 100 percent sure that the stimuli you think they're responding to are what's actually changing their behaviour". With as many as a hundred birds in a colony and all kinds of smells, sights and sounds changing around them at every moment, there is a great deal of room for uncertainty. This is why, in addition to observing the birds producing alarm calls in their habitat, the scientists needed to elicit the behaviour under controlled conditions.

The two research teams took different approaches to this problem. Sean Cunningham and Dr Robert Magrath at ANU brought life-sized models of predators to the study sites. To mimic a flying predator, the researchers threw a model of a goshawk or a sparrowhawk made of sculpted foam; the model would glide in the air for several dozen metres, triggering aerial alarm calls from noisy miners. "The birds were remarkably responsive to the gliding predators, and almost always called," says Robert Magrath. To imitate a landed predator, the scientists used taxidermic mounts of a sparrowhawk or boobook owl, which they placed on the ground. When the noisy miners noticed the model, they produced so-called 'chur' calls: the low-pitched alarm calls elicited by terrestrial threats.

The team at UNE, consisting of Lucy Farrow, Samantha Doohan, and Dr Paul McDonald, also imitated a flying predator in the wild by throwing a hat in the air. While the hat was airborne, noisy miners would produce their aerial alarm calls, but as soon as the hat landed, the birds would switch to the second type of alarm call. The scientists also used a freeze-dried carpet python as an alternative model of a terrestrial predator.

Both teams spent a long time in the field, recording many examples of the two types of alarm calls, and getting to know the personalities of individual birds and becoming familiar to them in the process. "I got to the stage where I'd pull into one of the colonies, and the birds would actually recognise my car and come down to the tree and just wait for food," laughs Lucy Farrow, who conducted the field work at UNE. "I've become one of them now, I think."

Next, the researchers needed to demonstrate that the alarm calls alone would be sufficient to elicit the appropriate behaviour from noisy miners. Both teams therefore independently conducted experiments in which they played the recorded calls back to the birds when no actual or simulated predator was around. Just as predicted, the two types of calls elicited very different reactions. As Sean Cunningham and Robert Magrath reported in their paper, when noisy miners heard the aerial alarm calls, they usually fled or sometimes froze in place in order to avoid detection by the predator. By contrast, when the birds heard the 'chur' call, which indicates a predator on the ground, they became vigilant and tried to approach the source of the sound – in other words, they exhibited the initial stages of mobbing behaviour.

The UNE team went a step further and brought individual birds to the lab for testing, where the calls could be played back to the birds under fully controlled conditions. Luckily, the researchers found that the birds handled being in the laboratory very well, as long as they

Noisy miners are always on the lookout for predators. Photo: Lucy Farrow

were given plenty of time to adjust to the new environment before testing began; afterwards, the birds returned home to their colony. This experiment allowed the scientists to demonstrate that when noisy miners hear the aerial alarm call, they look up, whereas when they hear the terrestrial alarm call, they look down. This shows that the birds understand the meaning of the calls correctly in the absence of any other cues.

The fact that the two research teams obtained the same results in flocks that could not have had any contact with one another is a powerful confirmation of their finding. "It's interesting that even though we have colonies that are eight hours apart, they're still exhibiting the same behaviour," says Lucy Farrow. "It makes it a beautiful big picture, in a way."

Interestingly, the scientists at UNE found that the birds were more likely to react to recorded alarm calls if those calls had been made by a familiar bird from the same colony. On the other hand, if the calls were from a bird from another colony, noisy miners were more apt to ignore the warning. Lucy attributes this to the birds' relatively long life span (up to nine years for males) and the resulting ability to develop a shared history with other birds in the colony. Just as humans are more likely to trust the words of a friend than a stranger, noisy miners seem to take the identity of the caller into account – a further testament to the sophistication of their social life.

Sadly, many people regard noisy miners as pests, and some have even called for culling the population of these birds. Although noisy miners have partly earned their poor reputation by their aggressive behaviour and exclusion of species such as superb fairy wrens, the dislike is also partly founded on confusion between noisy miners, a native Australian bird, and Indian mynas, an introduced species with a similar appearance. Because of this confusion, people are apt to view noisy miners as an unwelcome intruder, and may not care about the plight of noisy miners who are found tangled in fishing line, for example. However, Lucy Farrow stresses the importance of each individual in the noisy miner social system. The birds have monogamous pairs and are cooperative breeders, which means that helpers assist the parents in rearing the young. "Every individual is important in that system, and every individual has a place," says Lucy. Perhaps the impressive complexity of their social structure and communication is what has enabled noisy miners to survive and thrive in a landscape that is increasingly threatened by human activity.

Maria Ter-Mikaelian is a freelance science writer and animal lover who lives in the United States. She obtained her PhD at New York University, where she conducted research on animal communication and neurophysiology, and she has taught Animal Behavior at Columbia University. Her articles have appeared in the magazines *Animal Wellness* and *Small Furry Pets* as well as in online publications. She also blogs about animal behaviour and other popular science topics at medium.com/@maria.ter

Researcher Lucy Farrow spent weeks in the field. Photo: Lucy Farrow

HOW TO TELL THE DIFFERENCE BETWEEN
NOISY MINERS AND INDIAN MYNAS

A lot of people want to know how to tell a noisy miner from an Indian myna.

The Indian myna (also known as the common myna, common mynah or Indian mynah) has earned the reputation of being one of the worst feral animals in Australia. It's likely that if you live in Sydney, Melbourne, North Queensland or Brisbane, you're already familiar with it. This little brown bird might look harmless, but the World Conservation Union (IUCN) takes it very seriously. They put it on the list of the 100 most invasive species in the world and describe it as an extreme threat to Australia.

Humans don't get off easily either. Mynas carry bird mites and have the potential to carry avian-borne diseases that are dangerous to people, not to mention the huge amount of droppings they leave under their communal roosting trees. Often gathering at night in numbers more than a thousand, these raucous birds can take over clumps of trees, especially around areas where many people go (where they encounter fewer predators), such as shopping centres. In a short time, their droppings can cover 100 percent of the ground and public seating under the trees.

How did Indian mynas get into Australia?

The amazing thing is that these pushy little birds were put here deliberately, just like the fox and rabbit (which probably take the role of being the worst introduced species in Australia). In the 1880s there was a locust plague, so Indian mynas were brought in to control them. Of course, the mynas didn't stop the locusts but became another pest themselves.

Noisy miner

Things that the noisy miner and the Indian myna have in common

They're about the same size. Both birds are known for their aggression – the noisy miner can be extremely territorial over an area with nectar-producing plants and the Indian myna can attack other birds to get the best nesting holes.

Indian myna

You can discourage Indian mynas from your Australian garden by:

- keeping less open grassed areas in your garden;
- creating garden beds with dense planting, which will be a safe haven for smaller birds;
- planting native trees and flowering shrubs to attract native birds;
- providing small bird houses which only small birds can access;
- keeping a lid on your garbage and compost bins;
- feeding domestic pets inside if possible;
- ensuring that poultry pens are myna-proof;
- calling your local council to report sightings;
- obtaining a myna trap from your council;
- blocking holes in roofs and eaves;
- keeping palms well trimmed, and avoiding planting exotic species such as cocos palm, slash pine, radiata pine and umbrella tree as these are preferred Indian myna roosting trees.

If removing Indian myna birds from rosella nesting boxes is successful, within a few hours, some rosellas will already have settled back in to lay their eggs!

IT'S EASY TO DISTINGUISH BETWEEN THE TWO

NOISY MINER (*MANORINA MELANOCEPHALA*)	INDIAN MYNA (*ACRIDOTHERES TRISTIS*)
Indigenous to eastern Australia	Introduced species, part of the starling family from India.
Nectar-eating – enjoys nectar, fruit and the occasional insect.	Scavengers in urban parks, gardens and streets, they will eat almost anything surviving well on garbage, scraps, vegetable matter, other birds' eggs and even eating young hatchlings and small fledgling birds. They follow humans rather than natural vegetation and seasons.
Repetitive noisy chirping, especially when there are young miners around. They can also make a whole lot of noise when an intruder enters their territory. That intruder could be another type of bird, or a monitor lizard, a cat or even a person.	Calls include croaks, squawks, chirps, clicks, whistles and 'growls'. Often fluffs its feathers and bobs its head in singing. Screeches warnings to its mate or other birds in cases of predators in proximity or when it is about to take off flying.
Mostly grey body and black crown and cheeks. The bill is yellow, as are the legs and the bare skin behind the eye. Differ most significantly in their grey coloured plumage and slightly yellow-tinged wing feathers.	Mainly chocolate brown, with a black head and neck, a distinctive yellow beak, legs and bare eye skin. In flight, it shows large white wing patches.
Quite gregarious; they live in very territorial groups of around 6–30 birds combined into a loose colony of up to several hundred. They will unite to mob any predators becoming particularly noisy (hence the name) when ganging up on snakes and goannas and are very successful at driving other birds away.	Roost communally throughout the year, either in pure or mixed flocks. The roost population can range from less than one hundred to thousands. The time of arrival of mynas at the roost starts before and ends just after sunset. The mynas depart before sunrise. The function of communal roosting is to synchronise various social activities, avoid predators and exchange information about food sources.
Breeding season is from June to December when, up to 20 metres high in a tree and on her own, the female builds a cup-like nest of twigs and grasses softy lined with moth cocoons or wool and bound with animal hair and cobwebs. She lays 2–4 eggs a day apart for staggered hatching and incubates them for 15–16 days. When the chicks have emerged from the egg up to 10 males will come and join in their feeding exceeding up to 50 times an hour. The nestlings take about 16 days to leave the nest, and several broods may be laid in one season.	Breeding season: November to March. Believed to pair for life. The normal clutch size is 4–6 eggs. The incubation period is 17–18 days and fledging period is 22–24 days. Nesting material used by mynas includes twigs, roots and rubbish. Mynas have been known to use tissue paper, tin foil and sloughed-off snake skin. Use the nests of woodpeckers, parakeets etc. and easily take to nest boxes.
Hopping movement	Strutting movement

Creatures of the backyard

Brendon Carrick

My name is Brendon Carrick. I'm a nature enthusiast, avid hiker, macro-photographer and wildlife protection advocate. I believe we are at a crossroads in humanity: we either give up on the animals and the ecosystems of the world, or we fight and give conservation everything we've got to ensure diversity and the survival of life as we know it. With very little being done to stop extinction rates, we as a collective society must realise the importance of the natural world; understand that it is fundamental to our survival and make personal changes to take care of the planet. My goal is to eventually work in conservation and contribute to wildlife care and wellbeing. For now, I use photography and social media to present the creatures I find, informing people from around the globe about the wonders of life and all its forms. I recently crossed the ditch from New Zealand to live with my girlfriend in Adelaide, which has given me the opportunity to encounter and photograph a bounty of new and amazing creatures – some of which I have shared here.

Above is the eastern blue-tongued lizard, scientifically recognised as *Tiliqua scincoides*. I found this beauty just out the front of our house, taking refuge from the intense Adelaide sun under our recycling bin. I knew that it was a he due to his large, triangular-shaped head and thick tail-base. I was thrilled to find such an amazing lizard on my property, so I offered him some cold water and a delicious platter of fruit and veg. After a short time, I checked on him again and realised he was at risk with the neighbour's cat Rangi regularly roaming our front yard. I picked him up – to his disappointment – and transferred him to our back garden... not before snapping this shot of him and his vibrant tongue, which he uses to deter predators. The blue-tongue family is the most common large reptile found in both rural and urban gardens throughout South Australia. Sadly, these remarkable skinks are declining in numbers due to habitat loss, human encroachment, the use of pesticides, lawnmowers, cat and dog attacks, car fatalities and drownings. If you'd like to help the species – and potentially get some of them in your backyard – it's important that you keep your garden blue-tongue friendly. Rocks, logs, leaves and low shrubs will provide shade and shelter, and will also encourage the blue-tongue's favourite snacks (insects, snails and slugs) to inhabit your garden. With this in mind, providing refuge for these skinks also includes saying goodbye to the snail pellets, which make their way up the food chain and can have devastating effects on blue-tongues. Lawn mowing should be done only after ensuring that the area to be cut is blue-tongue free, as they are more likely to stand and defend their patch than run away from loud noises. Keeping pools and garden ponds reptile secure can also reduce potential drownings. Cats should be kept indoors or in a secure cat run, and dogs should be monitored when exploring the garden. Lastly, checking your driveway before leaving the house is advised. By abiding by these measures, we can help to protect these iconic lizards and in turn, allow them to continue playing a vital role in the ecosystem.

This armour-covered lady, of the species *Tiliqua rugosa,* is a close relative of our eastern blue-tongue friend. She goes by a multitude of common names, including stumpy-tailed lizard, sleepy lizard, bobtail lizard, two-headed lizard and the pinecone lizard. They are the bulkiest of the blue-tongues and can be found in desert grasslands, sand dunes, shrubland and forests. They are often seen underneath rocks, fallen trees, along the sides of roads and in clearings, where they can bask in the sun. They move up to 500 metres per day and have a more omnivorous diet than the eastern blue-tongue, eating vegetation and flowers as well as snails, insects and carrion. These skinks are also known for the lifelong bonds they form with their partners, extending their interactions with a mate well outside the breeding season. This bond has, tragically, been documented to extend past death, with the partners of individuals hit by cars staying by their mate's side for several weeks at a time. I found this girl at Para Wirra National Park. She was in the shade of a fallen tree, making the origins of the name 'sleepy lizard' very apparent. She was rather docile and calm, but they are known to become quite aggressive and hostile to potential threats. Like all the blue-tongues, a gaping of the mouth, expansion of the body, letting out a fierce hiss as well as biting are all used as a defence. These animals also face the same threats as their eastern blue-tongue counterparts. With the wild numbers decreasing also, care must be taken to preserve the species.

This gnarly-looking creature is known as *Colepia rufiventris,* or the red robber fly, belonging to the Asilidae family. This specimen was found on a cattle farm near Mount Compass. This individual was unlike most robber flies I've come across in that it didn't have a prey item in its mouth. A mouth – that, might I add – is designed for injecting poison and liquifying, then consuming its prey's insides (like a spider) through an appendage known as a proboscis, which can be seen puncturing the exoskeleton of its prey. Members of the Asilidae family catch their prey in a similar fashion to dragonflies, as air hunters. Robber flies feast on an almost unlimited array of insects, especially bees (earning them the nickname 'bee-killer'). They have been known to snatch spiders from their webs.

This beautiful dragonfly was found on a very sunny day at Frank Smith Park in Coromandel Valley. This park hosts many ecological niches thanks to Onkaparinga Council's efforts to revegetate the area, including scrub, wetlands, fields and a lake inhabited by dragonflies, damselflies and a host of other insects, fish, turtles and bird species. Despite a thorough investigation, I was unable to identify this adult dragonfly, most likely because there are over 325 species of dragonfly and damselfly found in Australia. These insects mostly dine on other flying insects, primarily mosquitoes, midges and flies. They will also hunt moths, butterflies, small fish or fry, and even smaller dragonflies, with some species engaging regularly in cannibalism. The larvae, which mature in water, eat practically any living thing smaller than themselves. Dragonflies were among of the first insects to evolve wings, according to the fossil record, about 300 million years ago. With today's modern dragonflies' wings spanning only 5 to 13 cm, the fossil record indicates dragonflies grew up to a whopping 60 cm. There are reportedly more than 5,000 documented species of dragonflies in the world, all of which (including damselflies) belong to the order Odonata, translating to 'toothed one' in Greek, which refers to both dragonflies and damselflies' serrated teeth

This species of jumping spider is known as *Helpis minitabunda* or the bronze hopper. It is a member of the Salticidae family, featuring over 600 documented genera and a whopping 5800 species, of which 252 species reside in Australia. With these numbers, the Salticidae is the largest family of spiders, all with incredible eyesight (the best of all arthropods), used for courtship, navigation and hunting. Jumping spiders also have a very surprising level of intelligence for arachnids and are often associated with cuteness and curiosity. They will interact with their environments (including humans and cameras) in an almost playful, inquisitive, attentive and even rambunctious manner, with no malice or desire to bite (something they will only do if handled roughly). They also love their reflections (although they probably think the spider they see in this reflection is a potential mate or competitor) and will turn to gaze at a camera lens, for this reason, making them perfect models for macro-photography.

These are huntsman spiders, and despite the fears associated with these guys, they are relatively gentle and passive creatures who would prefer *not* to be in the bad books of Australians as they lack the desire to be around us just as much as the Australian public does around them. Most have a very mild venom that is not dangerous to humans. Additionally, they are also very reluctant to bite humans and will retreat from perceived danger instead of attacking. Belonging to the Sparassidae family, huntsman spiders are semi-large spiders with long legs. They tend to have rather flattened bodies suited for living in tight locations. Their legs (unlike those of most spiders) have twisted joints, meaning they spread out forwards and laterally similarly to a crab, instead of bending vertically in relation to the body. It's for this reason they have been referred to as 'giant crab spiders'. They are often found under tree bark, amongst foliage, in and on rock walls, beneath logs and rocks, in letter boxes, behind clocks and under sun visors by unsuspecting drivers. There are reportedly 200 species of huntsman spiders in Australia and all of which are 'roaming hunters', meaning that they do not create webs to catch prey but use their wits, agility, strength and nimbleness instead. They dine on just about all types of insect and spider – including individuals of the same species.

BUNGARRA

MEDIUM MONITOR; BIG ATTITUDE

CHRISSY BANKS

It's been my experience that no matter the type of lizard I come across here in Australia, they all have attitude well beyond their size. From the feisty little garden skink to the swaggering big brothers and sisters of the monitor family, I think it's fair to say: our lizards are full of sass. And I *love it!* Who wants shy, wussy reptiles anyway?

I remember my first encounter with a large monitor. I was possibly eighteen or nineteen and had taken a day trip to escape the sweltering confines of a Brisbane summer. Where better to seek refuge than in the ancient forests of Springwood National Park. About 100 kilomentres south of, and a world away from, the hazy heat of Brisbane's southern suburbs, this is a subtropical rainforest, old as time and rich with the fragrance of earth and trees. The very moment I stepped from the car and inhaled deeply, I felt the strength of it begin to revive me. While my companions lounged around the picnic area and flared up the barbeque, I took a stroll. It was the quiet amid the trees that I longed for, time alone just to wonder, to slow my mind and let nature soothe the tension after a lengthy drive.

It didn't take long to find a narrow path that wound between a high stone wall and the thick of the forest. I was hemmed in, but it was cool there, quiet and very relaxing. I think I may have hummed as I walked. It was a good feeling being there. Good for my heart and good for my soul. A flitter of something small caught my attention, a butterfly, and for just a second I averted my eyes from the path. When I looked back, the biggest lizard I'd ever seen was coming toward me.

Good feeling gone!!! I froze mid-step, too astonished to do anything but stare. This creature was as wide as the path, stood as tall as my hip and was in full strutting high step. It moved with absolute, unhurried purpose and was not showing any signs of deviating. I had nowhere to go, and it wasn't stopping. To this day I have no memory of making a standing leap to the top of that wall, I simply have no idea how I got to be crouched on top of it: I either teleported or simply moved too fast for memory to grasp. Heart thudding against my chest, I watched as the most awesome creature I'd seen in a long time walked right below me. It didn't look up; didn't acknowledge me in any way. Why would it? It was the lord of the forest, and it knew it.

That memory is as rich today as it was hours after it was made. I can see that monitor in complete clarity, the calm way it moved, the length of its claws, its narrow snout, the flicker of its tongue... *Dragon* was the word that had come to me at the time. It was the only word that seemed to fit.

It wasn't my first encounter with a prehistoric-looking reptile of such size. I'd spent my childhood in Papua New Guinea, where our biggest danger was the most ancient of living reptiles, the pukpuk (crocodile and pronounced 'pook pook'), but this incident at Springwood National Park was among many I've had in Australia. Aussie lizards are awesome – big or small – and over the next two articles, we're going to have a look at two of my absolute favourites. First up, a bad boy of monitors: lean and mean, I give you the Bungarra!

Reaching an average length of 1.5 metres tip to tail, this is no diminutive backyard lizard. It high-steps just like a croc, has wicked long nails, needle-sharp teeth and was fully responsible for my involuntarily hugging a tree! Let me explain. We'd been hiking Bluff Knoll in the Stirling Ranges National Park in Western Australia. It's a tough climb up and

Above: The throat pouch is inflated with air to increase the size of the creature when it feels threatened.

The bungarra uses its tongue to catch scent molecules in the air and, like a well-designed map, it leads it to prey.

equally tough coming down. Nearing the end of the hike, I was fatigued enough to be looking not far in front of my feet and so didn't see the bungarra lazing beside the path. First I knew of it, it had lunged to its feet and smashed through the bush to get away. If I'd startled it catching an afternoon snooze, it scared the sense out of me! I let out a squeak and hugged the closest thing to me, a slender tree. With my arms safely wrapped around its trunk, my brain kicked in to tell me what I was seeing. There is something utterly fascinating about wild and powerful creatures, isn't there? Even though this bungarra was not full size, it would have easily tipped one and a half metres and had all the confidence I've come to recognise as a character trait in its species. Like me, it was getting over its initial shock and was truly sussing us out. Curious was the word that summed it up and not particularly afraid either. We had to keep giving ground as it advanced, tongue flicking in and out, scenting us until it eventually lost interest and slipped away into the bush.

Bungarras (*Varanus gouldii)*, as they are commonly known in Western Australia, also carry the names Gould monitor, sand goanna and racecourse goanna, the last of which I can testify as fitting. I've seen them motor, and if they're as fast as their cousins, the perentie, who have been clocked at just over 40 kph in short bursts of speed, then they're quick indeed. And they have to be, because the food they're after is quick: rabbits, mice and other small animals, small birds, small lizards, large insects, snakes (including the inland taipan) and just about anything they come across that doesn't move, e.g. carrion, often tucking into roadkill in a grunting, pushing pack – so I guess you can say they aren't fussy eaters. But they are relentless foragers and clearly not too bothered by another creature's venom, which suggests a cast-iron stomach. Like snakes, they have a long, forked tongue that flickers in and out searching for and catching scent molecules of their prey. Also like snakes, they devour their prey whole, so the size of the prey depends on the size of the predator.

Diurnal by nature, meaning they hunt during the day,bungarras are major fans of 'hole' digging. They dig for food, dig to lay their eggs, dig to make themselves a burrow, and it wouldn't take much to convince me that they might just dig for the fun of it too, which makes me very glad I don't have one in my backyard.

With the exception of the far-south coast of Western Australia, part of Adelaide, Victoria, Tassie and the very tip of North Queensland, this fabulous lizard can be found nationwide, from the coast to desert and forests; it will find its home just about anywhere. Australia has 25 species of monitor in varying sizes, but all with similar, though not exact, shades of colouring. Within the bungarra family, the colouration varies from a pale yellow to a motley combination of brownish-grey, or greenish-grey, to almost black along the dorsal surface. Scattered dots of lighter colour, sometimes cream, sometimes faded yellow, appear on the body. On dark legs, these marks are set apart creating a polka dot effect, but on the tail, they're so tightly packed they appear as bar-striping down its length. The tail is either black or brown with the last third pale in colour. Darker stripes appear on the head, and black flecks form dense irregular patterns down the back of the neck. Its undercarriage is fairly pale in colour, still with dotted markings, this time darker against the pale throat. The throat itself has a loose skin pouch that can be blow up to appear threatening if the need arises. Like all monitors, this is a muscle-packed, streamlined lizard that speaks of power, grace and predatory nature. And like all predators, it can fight!

Males literally belt into one another, bite, claw, wrestle and thump their opponent, injuring and drawing blood for the attention of a female. It is war when it comes to mating rights, and it is a messy and noisy affair. Males can give a terrible throaty hiss in combat that is a sound hard to forget. They can wound each other horribly in these contests, but for the winner it is worth it: his chance to mate with the female.

Once impregnated, the female, generally smaller in stature than the male, will search out a unique nursery for the laying of her eggs. She is a reptile, and like all reptiles, she is cold-blooded, meaning she is incapable of generating stable internal temperatures. So she relies on the warmth of the sun to heat her blood and allow her fluid movement so she can forage throughout her day. She does this by lying spread against stone, or any warm place, flattening out as much as possible to soak up warmth. To maximise this she knows to lie perpendicular to the sun to achieve the greatest coverage, and she basks. When she needs to drop her temperature, she will find a cool place to rest.

This is a daily ritual in a reptile's life. Even while the babies are in the egg, they require a regulated temperature to develop properly: too hot and they cook, too cold and they die. And in this situation, her genius abounds. In a land of daily fluctuating temperatures, the female bungarra has found a steady, warm incubator for her eggs. Turtles and crocodiles bury their eggs deep within a ground nest, but the bungarra is far more creative. She digs a tunnel deep into an active termite mound, with a pocket at the end and lays up to 17 eggs into the tunnel. When she is done, she refills the tunnel as best

she can, and while it might not be a neat job, she isn't worried; the termites complete the task, rebuilding their home around her eggs. The simple brilliance of this action is that termites regulate the temperature and humidity of their mound, so she has given her eggs the safest environment possible for the duration of incubation: the perfect reptile crib. Incubation lasts approximately 230 days, or longer if the temperature is cooler. Born excavators, the hatchlings dig their way out of the termite mound and are on their own from day one.

Dangers abound for young monitors: from the ground to the sky, they will be the prey of other bigger predators, possibly including adult bungarras, who are known to cannibalise carrion of their species. It is a very good thing they are fleet of feet. Earlier I spoke of seeing how quickly the bungarra can run but failed to mention that, like all monitors, when it sprints, it does so on its hind legs. It will move like a flash, and if there is a tree to escape up, it will take it. I once saw a lace monitor race away from our approaching car and scarper up the nearest tree covered in strangler vines. Unfortunately the vine it clung to wasn't attached to the tree very well, and its weight pulled the vine free. The poor creature ended up swinging like Tarzan, and it tickled me pink. I couldn't stop laughing. The memory of it amused me for hours. Most clumsy escape ever!!

Of course, it wasn't trying to be comical, it was trying to avoid being run over, and the incident did give me a great view of just how quickly they can move and climb. It's quite well accepted that most monitor species love hanging out in the trees and while they make climbing look quite elegant, they come out of trees more like a dropped pudding. None the worse for wear, they'll gather themselves off the ground and continue on their way. While burrows are dug as a den, monitors have also been known to sleep in tree hollows, so if you're out bush walking and thinking of monitors, don't forget to look up. And I hope you don't end up wearing one as a scarf. Now *that's* one up on a 'Drop Bear', isn't it?

Despite their weight and size, adult bungarras face dangers. Very little threat comes from natural enemies, but as seems to be the trend, a lot of threats come from us. In rural areas, our wells are deadly traps for curious monitors that have fallen in and can't get out again. This is a slow death and wells ought to be checked regularly. The destruction of termite mounds decimating their nurseries, habitat loss, road accidents, our never-ending thirst for development, and the domesticated pets we introduced, some of which have gone feral, all account towards loss of life for the bungarra.

Which is an absolute shame, because it's very hard, once you have interacted with a creature like the bungarra, not to feel a little awed by its ancient roots, that it has strutted this earth with calm dominance since before we were born. It is marvellous to share this earth, this country, with a creature so incredibly unique. I feel sad that the majority of society rushes by natural wonders, big and small, rarely pausing, consumed by the need to succeed, make more money, increase material possessions...

Where is the life in this kind of living? Where are the joy and the wonder we should feel for our world and its creatures? Have we forgotten to marvel at the very miracle of life itself? Without connection to where we live and to the other living creatures around us, are we not simply 'shadow living', never satisfied, never quite content?

Our souls are made to care and nurture, to shepherd species less capable, not so much from themselves, but from us. And while it seems easier to endear the human population to the cute and cuddly creatures of the country, there seems to be an inherited fear of the more reptilian kind, passed down through generations by ignorance.

My grandfather had a rather odd hobby. He made Australian animals out of used car tyres. One creation he had nailed to a tree near the front of his property. It was a great goanna heading up the trunk, and I have to say at first glance the thing looked very real. He told a story of how a female visitor refused to get out of her car until "that thing goes further up the tree!" Grandfather was hugely amused and chuckled, "You'll be waiting a while then, love."

You see, that woman feared the goanna would come down and run up her leg. Not likely, in fact, it would scarper up the tree to get away from her, but that was her genuine fear. Even when she knew it was a tyre sculpture, she wouldn't go near it, 'just in case'. We laugh at that and, of course, there is a necessary amount of caution needed when interacting with any wild animal, but the bungarra (or any monitor) is not a human hunter. It doesn't want to take us down and tear us to shreds, but what it does want is to live its remarkable life unhindered, free from the troubles we bring it.

Let's give it that chance. Whether you call it the bungarra, the sand goanna, the Gould's monitor or the racehorse goanna, the truth of it is, it is a marvellous, interesting, strong and curious creature that we ought to be very proud of and protect with all our hearts. After all, it's one of our very own, very real, very *alive* dragons and there is nothing mythical about that.

This big boy was a surprise to find, lying no more than two metres from where we were. He saw us well before we saw him. Close to topping full length it's safe to say *he* would have weighted in just under 6 kilos.

Australian Wildlife Society

University of NSW Wildlife Ecology Research Scholarship

The Australian Wildlife Society Wildlife Ecology Research Scholarship is open to postgraduate research students from any university in Australia undertaking a research project at University of New South Wales that is of direct relevance to the conservation of Australian native wildlife (flora or fauna).

The scholarship totals $5,000 and is awarded to one candidate, who receives one payment of $2,500 each semester. The scholarship is provided to support operational costs associated with the successful candidate's research project, such as:

- Travel associated with the research project
- Fieldwork expenses
- Specialist software
- Small items of equipment (i.e. less than $5,000)

The recipient of the 2017 scholarship was Corey Callaghan for his project on the impact cities in the Blue Mountains World Heritage area has on bird-life.

What impact do cities in the Blue Mountains World Heritage Area have on bird-life?

Corey Callaghan

Introduction

The Greater Blue Mountains World Heritage Area (GBWHA) is an area of 10,000 km² which lies about 180 kilometres from Sydney, New South Wales. It consists mostly of wilderness dominated by temperate forest including over 100 species of eucalypt. The area was listed as a world heritage area due to its rich natural and cultural values. In addition, 265 birds have been recorded within the GBWHA. Nestled within the middle of the GBWHA is an urbanised strip consisting of a small number of cities.

As we are all well aware, our birds are constantly facing a number of threats, such as habitat loss and climate change. Coupled with both of these are the impacts that a continually increasing urban population have on birds. For example, by 2030 60 percent of the human population is predicted to live in cities and one in three people will live in cities with a population greater than one million people.

So far, the impacts of urbanisation on birds have been fairly well-studied, both internationally and in Australia. For instance, we know that in general the species richness – that is, the number of species of birds – decreases with increasing urbanisation. We also know that (1) bird abundance and density increase with increasing urbanisation,

Some non-native species such as house sparrow and rock pigeon appear to be generally restricted to the most urban points, while others such as Eurasian blackbird are found more generally.

(2) cities are often dominated by larger-bodied birds, and (3) non-native birds are more dominant within cities as opposed to more natural areas. Although these patterns have been relatively well-tested, these studies have taken place in large, global cities such as Sydney, San Francisco or Berlin. Ultimately, few studies have tried to investigate these results within small-scale cities.

The aims of my project are to assess the aforementioned patterns within smaller cities (populations ranging from about 2,000 to 8,000), which reside within the GBWHA. I aim to identify patterns of bird composition, abundance, density, and traits across four small-scale urbanisation gradients.

Methods of the study

Thanks to a grant awarded by the Australian Wildlife Society, a small team of volunteers have been conducting bird surveys since August 2017. There are four transects, one each in Katoomba, Woodford, Hazelbrook and Lawson. Woodford, Hazelbrook and Lawson each have five dedicated survey points that are surveyed on each visit, while Katoomba

has nine dedicated survey points. The points, separated by about 500 metres, lie along a generally straight transect which is aimed to cut across both the most urbanised area of the city and also transverse a portion of the bush. There have been two visits per month to survey all of the transects and associated points. Five-minute point counts are conducted, where the observer records all birds seen and/or heard.

Preliminary Results

Thus far, we have conducted surveys on ten days for a total of 240 point-counts. A total of 86 species have been recorded on the surveys, with the most common being eastern spinebill, red wattlebird, pied currawong, yellow-faced honeyeater, and crimson rosella; recorded on 75 percent, 64 percent, 49 percent, 48 percent and 45 percent of surveys, respectively. Sixteen species have only been recorded once while six have been recorded twice. We have also preliminarily observed an increase in the number of bird species with decreasing urbanisation. Some non-native species such as rock pigeon and house pigeon appear to be generally restricted to the most urban points, while others such as Eurasian blackbird are recorded more generally.

Next Steps

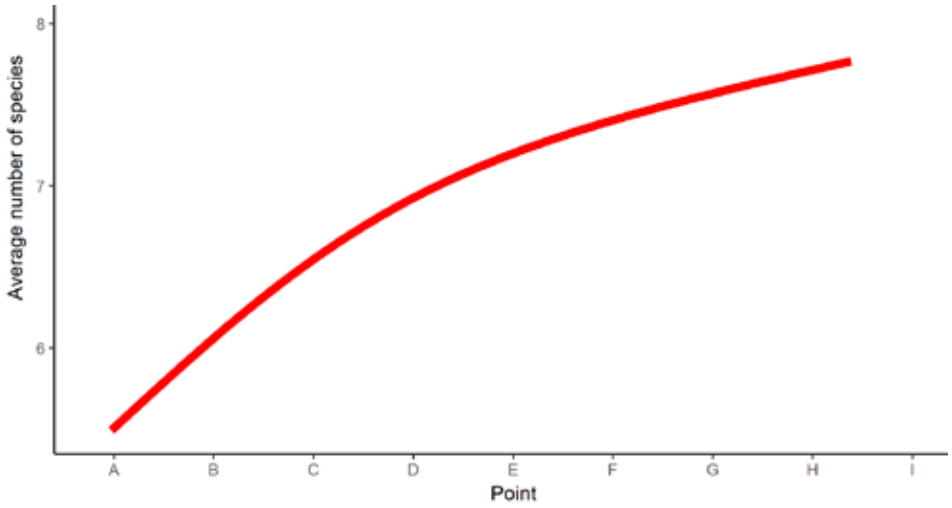
The next steps for the project include investigating species-specific trends to urbanisation to see which species are more commonly found in the urban area versus the bush area. Currently, some species appear to be restricted

A map of the four transects, located within the Greater Blue Mountains World Heritage Area, which have points aligned across them 500 metres apart. Transects are located in Katoomba, Lawson, Hazelbrook and Woodford.

Some species, such as varied sittella, have only been recorded once!

Rock pigeon

Rainbow lorikeet



A theoretical plot of the average species richness observed at each point, based on actual preliminary data. So far, we have observed a general increase in species richness as we move from Point A (nearest the most urban part of each city) to Point I (furthest from the most urban part of each city).

Grey fantail is frequently recorded in the bush but infrequently recorded in the urban areas, contrasting with rainbow lorikeet, which is generally only recorded in the more urban areas.

Red wattlebird has been the second most commonly recorded species so far, recorded on 64 percent of point-counts.

to the bush, such as grey fantail and white-throated treecreeper, while other native species are generally only recorded in urban areas, such as rainbow lorikeet and sulphur-crested cockatoo, and yet others are found commonly in both, such as crimson rosella and eastern spinebill. We will also continue to conduct the surveys until at least August 2018, completing a full year of surveys, at which point a full analysis will be conducted and our aforementioned hypotheses will be tested. At the conclusion of our study, our results will be shared with various land managers and conservation groups to inform them of the impacts that urbanisation is having on bird-life in the Blue Mountains region.

About me

I grew up in rural Western New York State (near Niagara Falls!). Since I was a small kid, I've had a strong passion for the outdoors, but when I was a freshman in college, I became mildly obsessed with birds. This obsession quickly translated into a passion for research relating to birds. I received my B.Sc. in Environmental Science from Canisius College in Buffalo, NY and then completed a Masters in Environmental Science at Florida Atlantic University in Boca Raton, FL. I started my PhD at UNSW Sydney in August 2016. This project is one facet of my overall PhD project which is focused on identifying urban ecological patterns in birds, relying largely on citizen science data. My supervisors include Professor Richard Kingsford at UNSW Sydney, Dr John Martin from the Royal Botanic Gardens, and Dr Richard Major from the Australian Museum. In my free time, one can usually find me camping/birding with my wife Diane and our dog Vader.

Australian Wildlife Society

University of Technology Sydney Wildlife Ecology Research Scholarship

The Australian Wildlife Society Wildlife Ecology Research Scholarship is open to postgraduate research students from any university in Australia undertaking a research project at University of Technology Sydney that is of direct relevance to the conservation of Australian native wildlife (flora or fauna).

The scholarship totals $5,000 and is awarded to one candidate, who receives one payment of $2,500 each semester. The scholarship is provided to support operational costs associated with the successful candidate's research project, such as:

- Travel associated with the research project
- Fieldwork expenses
- Specialist software
- Small items of equipment (i.e. less than $5,000)

The recipient of the 2017 scholarship was Reannan Honey for her research into habitat restoration.

Habitat restoration

Climbing up trees searching for possums and endangered birds is just another day in the office for PhD candidate Reannan Honey.

It's all part of Ms Honey's current research project investigating habitat restoration for animals that are dependent on hollows. "Tree hollows take a very long time to form – usually over one hundred years," Ms Honey said.

"With native forestry, we tend to cut down the trees that are over a hundred years old because they are the big ones that provide the most wood. The current strategy to solve this problem is using nest boxes. But so far, they haven't proved to be very effective, with many endangered animals often rejecting the nest boxes."

Ms Honey's research is looking at whether artificial hollows can provide an alternative option to nest boxes. "Artificial hollows are hollows that are cut into the tree itself," she said. "The face plate is removed, the trunk is hollowed out, and then the face plate returned with a hole in it so that the animal can enter and exit."

The project is in its early days with Ms Honey often travelling into the bush, trapping possums and sugar gliders to microchip and track them to see which animals are using the artificial hollows, and how.

Reannan's research will investigate whether artificial hollows can provide an alternative option to nest boxes for animals, like this possum. Photo: Reannan Honey

Now Ms Honey's research has received a generous boost thanks to the 2017 AWS Wildlife Ecology Science Research Scholarship, which she will spend on data logging equipment that will allow her to effectively measure temperature and humidity.

"Thermochron® and Hygrochron® are the size of a button-battery, and they can collect three months of data, such as temperature and humidity every hour – so they're pretty cool," Ms Honey said.

Possum

Ms Honey has been at UTS for six years, starting in a Bachelor of Science in Applied Chemistry, before transferring to a Bachelor of Science in Environmental Sciences. Last year she completed her honours research year investigating whether incubation temperatures affect the learning abilities in hatching geckos.

Ms Honey is also part of the Student Promotional Representative of UTS (SPROUT) team at UTS Science, and is passionate about science communication and talking to the general public about scientific discoveries.

"Communicating science is challenging; there's a lot more things that both scientists and the media could be doing to help explain scientific research better," Ms Honey said.

"I enjoy communicating my work to different audiences, and that's something I hope to develop more at as I progress through my PhD."

You can follow Reannan Honey on Instagram @reehoney17.

Long-nosed potoroo

Book Reviews

***Bush Bedtime* by Lorette Broekstra**

A super cute, colourful story exploring early counting concepts, featuring baby Australian animals.

Publisher: Allen & Unwin
RRP: A$14.99

***Bush Birthday* by Lorette Broekstra**

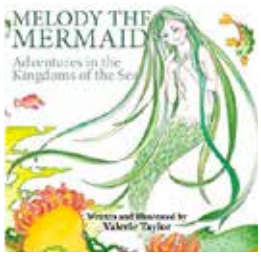
Colourful story exploring early language concepts, featuring baby Australian animals.

Publisher: Allen & Unwin
RRP: A$14.99

***Shorebirds in Action: An Introduction to Waders and Their Behaviour* by Richard Chandler**

Many people love books that blend photography and the written word. *Shorebirds in Action* provides a great example of how it can be done well. Photographs and text take up roughly equal space and great care has been taken to amalgamate the two into a coherent and well-organised volume. The book focuses on the behaviour of waders and uses carefully-chosen images that illustrate the themes covered in the text.

Publisher: Whittles Publishing
RRP: A$31.95



***Melody the Mermaid: Adventures in the Kingdoms of the Sea.* Written and Illustrated by Valerie Taylor**

The colouring book craze shows no signs of stopping. Budding artists of every age will enjoy putting their personal creative talents to work embellishing the natural beauty of Valerie Taylor's mesmerising marine scenes. This beautiful illustrated work will see children of all ages cheering for Melody as she seeks to save her friend Leafy and return home safely to the Kingdom of Pearl.

Publisher: Cathryn Castle Garcia
RRP: Softcover $22.95, Limited Edition Hardcover $39.95

GREAT OAKS FROM LITTLE ACORNS GROW

When our Director, Clive Williams, learned that William Ryan, publican at the Harold Park Hotel in Sydney, was collecting 5 cent coins in his business, Clive approached him to consider saving them for our Society. William was taken by the link between the echidna on the coin and the echidna we have as our Society's emblem and readily agreed. Not only that, he arranged for Clive to speak to other hotels and businesses in his area. As a result we now have several businesses collecting coins on our behalf.

We have provided signs and collection boxes for those that required them.

The Society has now decided to invite all of you, our members and friends, to participate in this fundraising process. We have purchased collection boxes which we will mail to those of you who request them. Use them at home or at your place of work, invite friends and colleagues to take one and invite your friendly local businesses to join in. By this means small individual efforts can lead to a grand achievement. The proceeds will be used for the Society's programs, such as the university grants.

Once the collection box has been filled, just take it along to your nearest Commonwealth Bank. All the deposit details are printed on the bottom of the box. Once the coins have been banked, let us know your details and how much has been banked and we will send you a tax deductible receipt.

Email us at accounts@aws.org.au for your collection box.

AUSTRALIAN WILDLIFE SOCIETY
PO BOX 42 BRIGHTON LE SANDS NSW 2216 | (ACN 134 808 790)

PRESIDENT'S ANNUAL REPORT FOR 2017

A year in review

The past year for the Society has been one of consolidation and growth. I was honoured to be elected as President following the Annual General Meeting. We were delighted to welcome a new member to the Board – Christine Banks, a very keen wildlife conservationist and author.

A highlight of the year was the introduction of a new award – the **Wildlife Rehabilitation Award.** Our Society knows that many organisations and thousands of volunteers are already working tirelessly to save our threatened species as well as the humble and more common Australian species and the precious wildlife habitat in which they live. We are all aware of the wonderful work being carried out by volunteers across the country in saving our sick and injured wildlife. We wanted to recognise and help these individuals or conservation groups continue with their good work on behalf of the whole community. Our Society introduced this new award with a trophy and a cash award of $1,000.

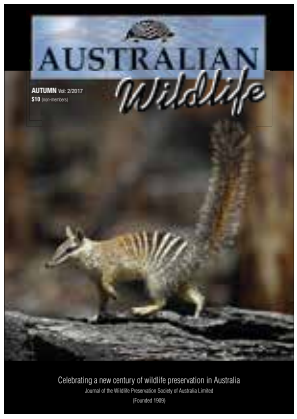
We also introduced the **Australian Wildlife Society Threatened Wildlife Photographic Competition** – an annual national competition that awards and promotes endangered Australian wildlife through the medium of photography. We invited photographers to raise the plight of endangered wildlife in Australia. Our Society aims to encourage the production of photographs taken in Australia, by Australians, which reflects the diversity and uniqueness of endangered Australian wildlife. An annual judge's prize of $1,000 and an annual people's choice prize of $500 will be awarded.

Australian Wildlife magazine

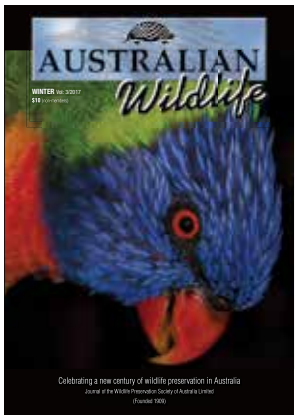
Our coloured *Australian Wildlife* magazine is the flagship of the Society and has proved to be extremely popular amongst all of our members. We invite members to distribute copies to family and friends and to invite them to become members. A special thank you to our Subeditor, Sabine Borgis, for her valuable contribution to assisting with the editing of the magazine.

Our fortnightly email wildlife newsletter has also proven to be very popular with our members and we encourage them to forward the newsletter on to their family, friends and associates to help spread the wildlife conservation word. A big thank you to Linda Dennis, Editor of the newsletter, for her valuable work in keeping us regularly informed on wildlife matters. If you have not registered your email address and would like to be put on the email list to receive the fortnightly newsletter, please contact accounts@aws.org.au with your details.

Summer Cover



Autumn Cover



Winter Cover

Spring Cover

Website

We continue to update our website to make it more user friendly. Changes to the structure and layout will be an ongoing process. It is also planned to design and implement a 'Members Only' section. We also hope to make the application process for new members simpler. Members are encouraged to view the website and send any feedback via email to: info@wpsa.org.au

Wildlife rescue calls

We continue to receive numerous and wide-ranging distress calls for help from members of the public about sick, injured and stranded wildlife across Australia.

Our Mission

Part of our Mission Statement reads: "Our mission is to conserve Australia's fauna and flora through education and involvement of the community. We are dedicated to the conservation of our unique Australian wildlife in all its forms through national environmental education programs, political lobbying, advocacy and hands on conservation work." To fulfill this goal we introduced the University Student Grants Scheme in 2005 and since its inception have awarded over 130 grants to very worthy recipients. In 2016 we increased the grant to $1,500 and plan in the future to steadily increase the dollar amount of the grants subject to further donations, which are always welcome.

Wildlife Science Ecology Research Scholarships

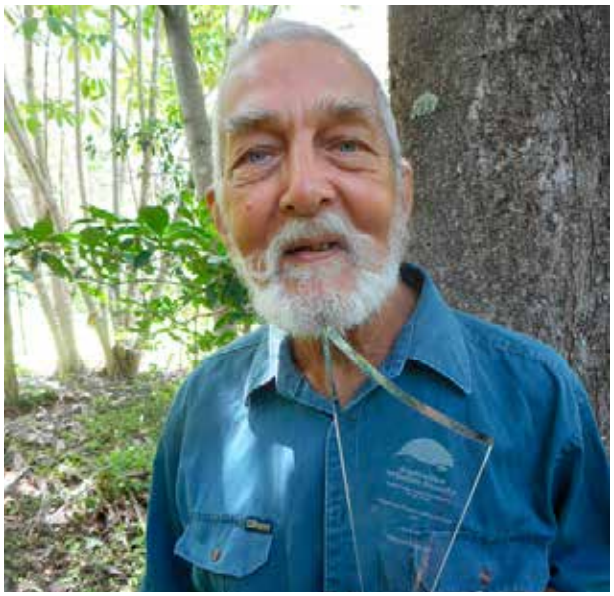
The 2017 Australian Wildlife Society Wildlife Ecology Research Scholarship was awarded to UTS School of the Environment PhD student Reannan Honey for her project titled 'Habitat restoration of hollow bearing trees for hollow-dependent fauna'.

In 2017 we introduced a new scholarship, the Australian Wildlife Society Wildlife Ecology Research Scholarship. It is open to University of New South Wales postgraduate research students who are undertaking a research project that is of direct relevance to the conservation of Australian native wildlife (flora or fauna). The scholarship totals $5,000. The inaugural winner was Corey T. Callaghan for his project titled 'Bird Conservation in the Blue Mountains World Heritage Area – response to urbanization?'

Wildlife Conservation Awards

The winners of the **Serventy Conservation Award** for 2017 were Rupert Russell of Mt Molloy, North Queensland and Graeme Sawyer of Darwin, Northern Territory.

Rupert Russell has made a remarkable contribution to wildlife conservation in North Queensland for over 40 years, ranging from the protests over the destructive road-building in the Daintree Rainforest to his present involvement in the yellow-bellied glider project.



Rupert Russell

Graeme Sawyer was actively involved in the establishment of the Australian Association for Environment Education (Northern Territory) in 1987 and has maintained an active involvement in it ever since.

Graeme Sawyer

The winner of the **Community Wildlife Conservation Award** was made to Frog Safe Inc. of Edmonton, North Queensland. This organisation has operated a frog hospital for 18 years, treating over 3,000 frogs in that time, and has developed a deep understanding of frog health through untold hours of research.

The winner of the inaugural **Wildlife Rehabilitation Award** was Roz Holme of Cedar Creek Wombat Rescue and Wildlife Refuge. Over 30 years ago, Roz and her husband Kev recognised the plight of the bare nosed wombat. Animals that until recently would have died if left untreated are given a chance to recover and continue to help maintain the healthy population.

Suzanne Medway and Roz Holme

Wildlife Photographic Competition

The annual judge's prize of $1,000 was won by Native Animal Rescue of Western Australia (Mike Jones, Black Cockatoo Coordinator). The winning entry was a photo of a forest red-tailed black cockatoo named Makuru.

The annual people's choice prize of $500 was won by Matt White. Matt's entry was a photo of a greater glider.

Gala Dinner

In June we held the Society's inaugural Wildlife Gala Dinner to raise funds for Australian wildlife conservation. It was an outstandingly successful social evening, with some 250 guests enjoying the festivities. A special thank you to all our sponsors who contributed to the fundraising for the evening, and especially to Tim Faulkner of Devil Ark for being our eminent guest speaker. Before telling an enthusiastic audience about Devil Ark, Tim spoke about the threat of extinction to many species of Australia's precious wildlife.

L to R: Patrick Medway, Ken Mason, Noel Cislowski, Clive Williams, Suzanne Medway, Robyn Weigel, John Weigel, Trevor Evans and Wayne Greenwood.

Suzanne Medway and Tim Faulkner

2017 – University Student Grants Scheme

The Australian Wildlife Society's University Research Grants are scholarships offered to honours or postgraduate students at Australian universities. Each year, ten grants of $1,500 are awarded. Grants are available for research projects of direct relevance to the conservation of Australian wildlife – plant or animal. The winners for 2017 were:

Glen Bain - School of Biological Sciences, University of Tasmania
Project title: Restoring Resilience in woodland bird populations of the Tasmanian Midlands

Sieara Claytor - James Cook University, Cairns
Project title: The role of serotonin in frog host response to chytridiomycosis

Christopher Gatto - Monash University, Melbourne
Project title: The role of nest moisture in sea turtle primary and operational sex ratios Introduction

Ana Gracanin - University of Wollongong
Project title: Does deforestation promote developmental stress in spotted-tailed quolls?

Md Anwar Hossain - School of BioSciences, University of Melbourne
Project title: Assessment of the vulnerability of freshwater crayfish to climate change

Le Ma - School of Veterinary and Life Science, Murdoch University, Perth
Project title: Protecting our unique key stone species, *Westralunio carteri,* the only species of freshwater mussel in South-western Australia

Diana Prada - School of Veterinary and Life Sciences, Murdoch University, Perth
Project title: Conservation of insectivorous microbats; connecting genetics and infectious disease threats in Australia's global biodiversity hotspot

Kit Prendergast - Curtin University, WA
Project title: Determinants of native bee assemblages in urban habitat fragments in the southwest Australian biodiversity hotspot and interactions between honeybees (*Apis mellifera*) and native plant-pollinator communities

Peter Puskic - School of Biological Sciences, University of Tasmania
Project title: Novel assessment of the relationship between plastic ingestion and fatty acid profiles in three species of Australian shearwaters

Emily Quinn Smyth - University of Technology Sydney
Project title: Impacts of lantana invasion in remnant forest on habitat use by native fauna: a multi-taxon approach for conservation

2017 Conservation Group Grants

The Board of Directors carefully considers all requests for grants from other wildlife conservation groups and places a special emphasis on native wildlife research, conservation and the preservation of wildlife habitat. We lobby organisations and government bodies on their behalf and make donations to assist them in their special wildlife conservation projects. Conservation grants were made to the following projects:

- Devil Ark – a major contribution was made to build an adolescent devil enclosure at Devil Ark, Barrington Tops
- Fourth Crossing Wildlife – funds were supplied for attending wildlife conferences, making presentations on behalf of the Society
- Adelaide Koala Hospital – to buy new equipment for the rehabilitation of injured koalas
- Illawarra–Shoalhaven Great Eastern Ranges Regional Partnership – to deliver two pest control workshops and purchase 10 feral fox and cat cage traps designed to reduce predation on native fauna in the local national parks.

Conferences and wildlife research seminars

The Society's directors attended and contributed to a number of important wildlife conservation conferences, seminars and meetings throughout the year. We actively initiated and sponsored many of these conferences and participated in others. AWS is an active member of the Nature Conservation Council of New South Wales. Our Society's CEO is a representative on a number of pest animal control committees and attends both city and country meetings. We attended the Australasian Wildlife Management Society 30th Anniversary Annual Conference in Katoomba in December 2017.

Radio and Cruise talks

The Society's CEO and honorary secretary, Patrick Medway, continued to promote the Society by giving lectures to various groups and schools. He was again a guest on ABC Radio's *Nightlife with Tony Delroy* to answer questions on wildlife conservation issues from across Australia and launched a major lecture series for Royal Caribbean Cruise Lines on native Australian fauna and flora.

Donations, bequests and gifts

During the year we continued with our bequest program to encourage donors to support our wildlife conservation work across Australia through the website and through general publicity. We are very grateful to all our members for considering using the bequest program to help the Society with its long-term planning. Please contact the National Office for more details on the Bequest Program and on how to join the Friends of the Society and make a regular monthly donation to support our national wildlife conservation programs. We hold Australian Tax Office gift deductible status for any donations over $2.

Financial Report summary

The Society's directors and the Finance and Investment Committee continue to exercise tight and effective control over our finances, reviewing and adjusting the investment portfolio as required during the year. The investment funds of the Society have continued to grow. During the year we instigated a major review of the financial records of the Society that are maintained in a Reckon system. The directors are now fully satisfied that the financial records are accurate and correctly reported as we plan for the future.

Moving Forward

The process of gradually moving the national office to Narellan was commenced with the transferring of the membership functions to what we hope will be the permanent national office of the Society.

A special thankyou to all our members

May I wish every member of the Society a happy, healthy and prosperous 2018 and thank you all most sincerely for your tremendous support and continued dedication and commitment in helping the Society to preserve and protect our native wildlife for future generations of young Australians.

Suzanne Medway AM | PRESIDENT | 31 December 2017

Membership Form

Membership

Become a member of the Australian Wildlife Society
Simply fill out this form.

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

Name:.....

Address:.....

City/Suburb:..... Postcode: .....

Telephone:..... Fax: .....

Email: .....

Membership category (please tick)

- ☐ Individual: $55
- ☐ Family: $70
- ☐ Concession (pensioner/student/child): $50
- ☐ E-mag (emailed as PDF, no hardcopy will be sent): $30
- ☐ Associate (library, school, conservation groups): $85
- ☐ Corporate: $125
- ☐ Life: $2,000

(Includes postage within Australia. Add $40 for overseas postage)

Three year membership (please tick)

- ☐ Individual: $150
- ☐ Family: $190
- ☐ Concession (pensioner/student/child): $135
- ☐ E-mag (emailed as PDF, no hardcopy will be sent): $81
- ☐ Associate (library, school, conservation groups): $230
- ☐ Corporate: $340

(Includes postage within Australia. Add $60 for overseas postage)

Payment details (please tick)

☐ Direct Debit ☐ Cheque ☐ Money Order ☐ Mastercard ☐ Visa

Card Security Code (CSC) __ __ __ __

Card Number:

Name on Card: .....Expiry:.....

Signature:.....

Amount $.....

Donation $.....

Total $.....

Mail to the: **Australian Wildlife Society**
PO Box 7336, MT ANNAN NSW 2567.
Email: accounts@aws.org.au Website: www.wpsa.org.au

Direct debit: **BSB:** 062 235
Account No: 1069 6157
Account Name: Wildlife Preservation Society of Australia trading as the Australian Wildlife Society

Membership Hotline: Mob: 0424 287 297

Note: All cheques to be made out to the Australian Wildlife Society

Consider - A Bequest

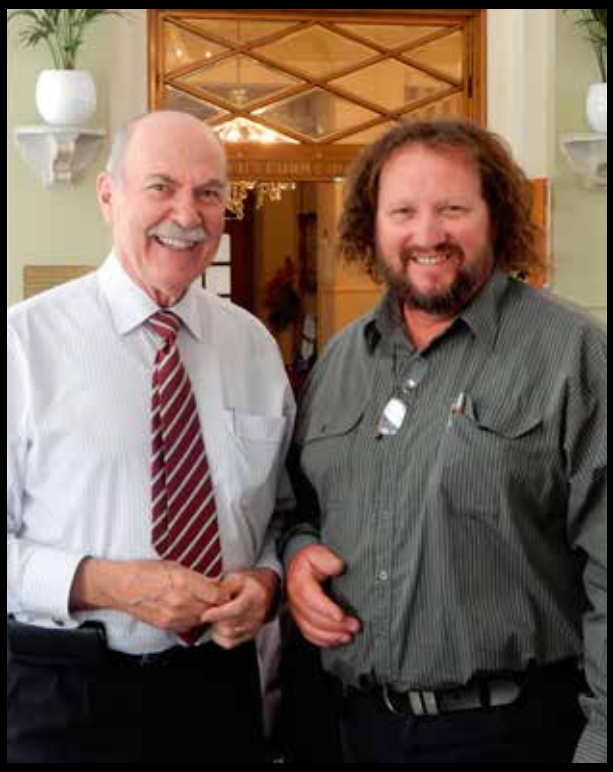
Another way which you can support the work of the Australian Wildlife Society is to remember us in your will.

If you would like to make a bequest, add the following codicil to your Will:

> I bequeath the sum of $..... to the Wildlife Preservation Society of Australia trading as the Australian Wildlife Society for its general purposes and declare that the receipt of the Treasurer for the time being of the Society shall be complete discharge to my Executors in respect of any sum paid to the Wildlife Preservation Society of Australia Limited trading as the Australian Wildlife Society.

"The challenge to the present adult generation is to reduce the increasing pressures on the Earth and its resources - and to provide youth with an education that will prepare them emotionally and intellectually for the task ahead.

ANNUAL PRESIDENT'S LUNCHEON



Patrick Medway and Trevor Evans

Philip Sansom and Stephen Grabowski

Left hand side - Suzanne Medway, Robin Crisman, Roz Holme and Kev Holme. Right hand side - Sue Emmett and Wayne Greenwood