AUSTRALIAN Wildlife

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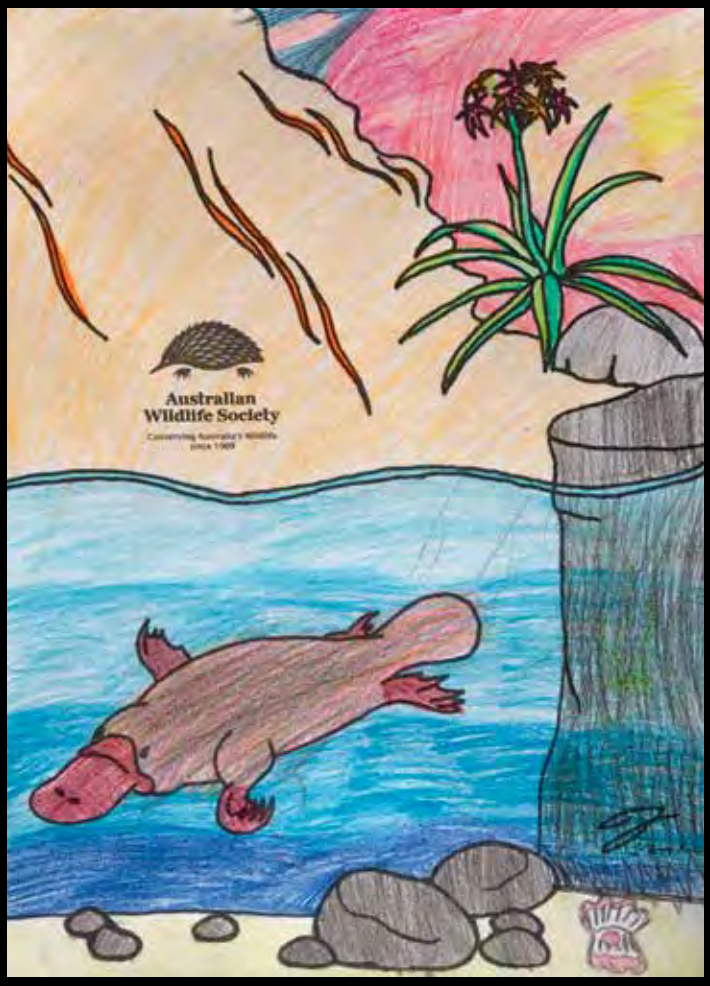
Celebrating a new century of wildlife preservation in Australia

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

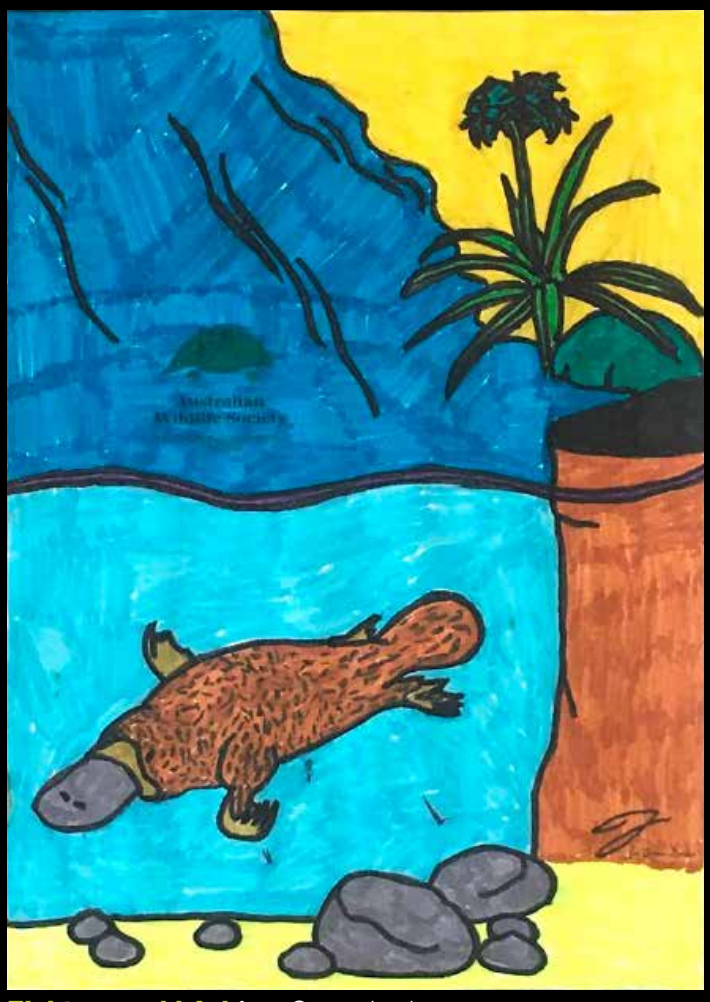
2020 Colouring-in Competition



Nine-year-old Aafje from Tasmania

Twelve-year-old Isabelle from Western Australia

Eleven-year-old Vealove from Victoria



Eight-year-old Axl from Queensland

Nine-year-old Christopher from the Australian Capital Territory

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Sub-Editor, Australian Wildlife

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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 2021

Member Notice

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

With the support of a dynamic board of directors, the Australian Wildlife Society has continued its position, held since 1909, as a peak environmental and wildlife conservation Society, recognised not only in Australia but internationally.

I have had the privilege and honour of serving in the role of President of the Society for the past twelve years. My mission during this time has been conserving Australia's precious wildlife. The evolution of this mission was the privilege of supporting my 'heroes', the rescuers and rehabilitators who do the hands-on wildlife conservation work, supporting students studying wildlife conservation, and educating the community on just how precious and unique Australia's wildlife is.

I joined the board because I thought my leadership skills, based on a long and successful business career, enabled me to lead, motivate, and develop a strong team of board members to build a sound financial base, with a clear vision, to save Australia's unique wildlife for the next generation of young Australians.

My overall responsibility has been nurturing, growing, and making the Society more relevant in today's harsh environmental climate. After many years of succession planning, it is now time to hand the 'reins' over to a younger generation with new and exciting ideas to move the Society forward. I am sure whoever the board selects to replace me as President will bring a whole new style and focus to the Society.

So much has changed in the environmental and wildlife conservation movement, and within the Australian Wildlife Society, since I joined the board of directors over twenty years ago. We have seen many wonderful directors come and go, and it has been a pleasure serving on the board with so many inspiring characters.

The editorship of the *Australian Wildlife* magazine has been a highlight of my time on the board. The magazine's readership has spread across Australia and internationally, carrying a strong message of environmental education, wildlife conservation issues, and preservation of native wildlife. It is now the flagship of the Society.

With the support of a dynamic board of directors, the Australian Wildlife Society has continued its position, held since 1909, as a peak environmental and wildlife conservation Society, recognised not only in Australia but internationally.

It is now time to move on to a different phase of my life, and I wish the Australian Wildlife Society, the board of directors, and existing members all the best for the future.

Suzanne Medway with Megan Fabian at the front of the new National Office in Hurstville, New South Wales.

Creating Rocky Habitats for Enhancing Fish and Fisheries

Iain Suthers and Hayden Schilling

An estuary means many things to many people – an experience, a holiday, a business, a commute, or a port, but without question, estuaries are under increasing developmental pressure. Our estuaries are a greatly valued space and recreational fishing is often a key part of the estuary experience. Twenty years ago, the New South Wales state government brought out a proportion of estuarine commercial fishing operations, to create and declare thirty recreational fishing havens. These fishing havens represent twenty-seven percent of the overall estuarine area in New South Wales. In some of the larger estuaries, such as Lake Macquarie, the formation of these havens have improved the harvest rate of key recreational species such as mulloway (*Argyrosomus japonicus*) and the yellowtail kingfish (*Seriola Ialandi*). In Botany Bay, harvest rates have been improved for species such as the dusky flathead (*Platycephalus fuscus*), tailor (*Pomatomus saltatrix*), and sand whiting (*Sillago ciliata*).

During the same time, a recreational fishing fee of $25 per annum for most adults was announced (the fee is now $35 per annum). The funds are deposited into Recreational Fishing Trusts and used to increase fishing opportunities for anglers. The trusts fund many initiatives, including research and stock enhancement on estuarine species and the deployment of designed artificial reefs. The emphasis on designed reefs signified the seismic change in our knowledge and attitudes, from deploying 'materials of opportunity' (such as tyre reefs and old car bodies) to structures that are attractive to fish, algae, and invertebrates. Many of the recreational fishing havens were dominated by extensive sandy substrate, without natural reef or seagrass beds, which prompted the question of whether concrete fish modules would significantly enhance fish diversity and fishing. Previous research, on artificial reefs in Australia and overseas, was plagued by a boom-bust cycle of enthusiasm, ad-hoc deployments, and then apathy. Consequently, we were really in the dark about what to expect about the rate of colonisation by fish and invertebrates, and the comparison with the natural rocky reef. Not only that, but in a public space, the very deployment of concrete habitats would be controversial – even if they were optimally designed and pH stabilised. One controversy is the old chestnut of fish attraction versus fish production; the modules may simply attract fish from other natural habitats, or the modules may create a new ecosystem of prey and predators that were not possible before.

Nearly ten years ago, the University of New South Wales began an exciting collaboration with Heath Folpp and Michael Lowry, New South Wales Department of Primary Industries Fisheries, to examine the scientific basis and justification for reef ball deployments. The project focussed on three large estuaries that had large expanses of sandy substrate – Lake Macquarie, Botany Bay, and Saint Georges Inlet. Over the next few years, Department of Primary Industries deployed, into each estuary, 180 'Mini-Bay Reef Balls' – commercially made concrete domes or spheres with holes – divided into six patches of thirty units. These units rested on top of bare sand and each unit measured 0.7 metres in diameter and 0.5 metres in height. A standard way to monitor fish in these situations is to deploy an underwater

University of New South Wales artificial reefs at four months.


University of New South Wales artificial reefs at twelve months.

video camera, mounted on a steel frame for forty minutes, with a standard bait bag to attract the fish. The bait overcomes the shyness of the fish and encourages them to leave the safety of their habitat during daylight, although there are some caveats to the method.

To learn about changes in the fish community, as the artificial reefs developed, the project monitored the 'new' reef sites, as well as nearby natural reefs, for three months before deployment. The reef sites were monitored again one year and two years after the initial deployment. Initially, the reefs were swarmed with striped trumpeter (*Pelates sexalineatus*) – they were simply attracted to the structures as there was nothing yet growing on them. The structures provided them with some protection and habitat. Within a few months, other species such as bream (*Acanthopagrus australis*), tarwhine (*Rhabdosargus sarba*), and pink snapper (*Chrysophrys auratus*) appeared. The striped trumpeter declined in abundance and was sometimes observed with bite marks. A little ecosystem was beginning to form. Macroalgae grew on the reef balls and octopuses sometimes ventured out towards the bait. One year later, the diversity of fish and invertebrates increased to seven or eight species on average, in each video sample. Two years later, there was only a slight further increase. Evidently, the new reef modules were very attractive to fish as habitat, but did they produce fish?

To answer the question whether the artificial habitat increased the overall abundance of fish, the project focussed its attention on the abundance of bream, tarwhine and pink snapper – all from the family Sparidae – as these 'sparids' are an iconic estuarine species. Surprisingly, after two years, twenty times more sparids were found on the reef balls than in the adjacent natural reef. The strongest effect was seen in Lake Macquarie which had very little natural reef (only five percent of the estuary). Whereas, the weakest effect was seen in Botany Bay which already had a considerable natural reef (forty percent of the estuary). The result led to a lingering question about artificial reefs. Were these fish new to the area or were they simply attracted to the artificial reefs from nearby existing natural reefs? By looking at the abundance of fish on nearby reefs, also monitored over the same period, the project demonstrated that it was not due to the cause of attraction, because abundance increased on both the natural reefs as well as the artificial reefs. The findings suggested a synergy between the new modules and the natural reef, which ecologists describe as 'connectivity'. The project also wondered if improving estuarine water quality or climate change had created the overall positive effect, but each estuary's deployment was in different years and seasons, encompassing a wide range of conditions, which effectively removed the impact of these factors.

Building on the success of these early estuarine artificial reefs, New South Wales Department of Primary Industries Fisheries has since expanded the artificial reef program. Existing reef fields have been increased in size, for example, Lake Macquarie now holds over five hundred individual reef balls. The estuarine reefs have been expanded to six estuaries and seven large offshore artificial reefs have been deployed, with more to come. Next, will be the Tweed offshore artificial reef.

What is the limit to artificial reefs? Is it always the case that if you build an artificial reef the fish will come? Previous research conducted by the University of New South Wales, on the Sydney offshore artificial reef, has shown that reefs could be made up to forty metres in length with fish and invertebrates supported by plankton floating past. These populations would not likely exist without the structure facilitating access to zooplankton. Therefore, artificial reefs may be part of the solution to increasing sustainable fisheries or restoring lost habitat in our urbanised estuaries and coasts. Along with other targeted marine environments, enhancement initiatives such as water quality improvements, tidal movement, and stock enhancement of key species, the future of our beloved estuaries and marine environments is looking better.

For more information on New South Wales artificial reefs, including locations, see the New South Wales Department of Primary Industries Fisheries website: dpi.nsw.gov.au

University of New South Wales artificial reefs at eighteen months.

The Need to be Plastic-Free

Joanna Atherfold Finn

On an otherwise unremarkable day in June 2011, 'Plastic Free July' founder, Rebecca Prince-Ruiz, had a profound awakening at her local materials recovery facility. Staring at the mountains of rubbish, she saw the reality of what happens to our recycling when it is collected on bin day.

As Rebecca describes in *Plastic Free: The Inspiring Story of a Global Environmental Movement and Why It Matters,* "That day, I saw the reality of my community's recycling efforts, and I was struck by the challenges of dealing with one 'recyclable' material in particular: plastic. Just because a material *can* be recycled, that does not mean that it *will* be recycled".

As a keen bushwalker, with a background in Environmental Science, Rebecca was deeply troubled by what she saw and knew that she had to take responsibility for her own choices. It would never be enough to just pick up litter on a hike or think that, as a society, we can recycle our way out of the pollution problem. Reducing our consumption had to be at the heart of the solution.

Rebecca's 'penny drop' moment would result in a small group of people committed to trying to go single-use plastic-free for the month of July. Today, 'Plastic Free July' is a global phenomenon with over 300 million people in 177 countries taking on the challenge and reducing plastic waste in their households, communities, and workplaces.

The 'Plastic Free July' challenge is a positive campaign where people do what they can with what they have. In saying this, Rebecca does not shy away from discussing the damage that plastic causes to land and aquatic environments – homes to our unique wildlife. We cannot separate our reliance on a product, that is made to last forever, from the ultimate impact it has on those fragile ecosystems and wildlife species.

Plastic Free shares a variety of stories, including one where Rebecca witnessed images of a young flesh-footed shearwater (*Puffinus carneipes*) with plastic fragments in its stomach, when 'Plastic Free July' was in its infancy. It strengthened her determination to understand the plastic pollution problem more fully.

"Seeing these images of dead shearwater chicks for the first time truly shocked me," Rebecca said. "It is not that I did not know about plastics harming wildlife, but this was so close to home, and these were items I recognised and had used in my daily life". The plastic issue, as we know it, is not confined to some distant shore or polluted beach in a country without waste management systems, it is everywhere.

Rebecca also makes the connection between items that wildlife ingests, or becomes entangled in, and the plastic items frequently found during community clean up days. It is those connections that reinforce that plastic pollution really is our problem, and we are the ones with the means to make daily decisions that benefit our environment. As Rebecca has travelled

around the world, she has come to realise that plastic pollution is not just an ocean problem, affecting many marine species, but land-based wildlife is impacted too. You only need to see the courtship bower of a satin bowerbird (*Ptilonorhynchus violaceus*) with bright blue bottle tops, milk bottle rings, straws, and pegs alongside flowers, feathers, and shells to realise the extent of the problem.

So how can we make a difference? *Plastic Free* charts the stories of people Rebecca has met over the past decade, from everyday mums and dads to scientists and researchers from around the world. It is those personal experiences that inform a determination to make the change that starts upstream with each and every one of us. By taking responsibility and committing to new habits that reduce our reliance on plastic, we can all play an integral role in reducing the impact this reliance has on the environment and wildlife. *Plastic Free* shares what has worked for others with tips from people who have taken on the challenge and made a difference, reminding us that small actions can make a huge impact.

Above left: Rebecca Prince-Ruiz holding the book *Plastic Free* at a recycling facility. Image: Tashi Hall

Rebecca Prince-Ruiz on a plastic pollution research expedition in the North Atlantic Ocean. Image: Chiara Grioni

Rebecca Prince-Ruiz with Craig Reucassel, comedian and presenter of *War on Waste.* Craig Reucassel creates a giant plastic-filled footprint in the middle of Manly beach to highlight the shocking amount of plastic packaging we dispose of every minute. The aim of the message – to encourage all Australians to reduce their plastic usage by looking at ways to avoid it.

Surviving the Fires

Life on the Rocks

Natalie Simpson

Friends of the Brush-tailed Rock-wallaby is a not-for-profit organisation that has been active in the Kangaroo Valley region of New South Wales for the last twenty-five years. They advocate for the protection of the endangered brush-tailed rock-wallaby (*Petrogale penicillate*) in the Kangaroo Valley and beyond, working alongside National Parks and Wildlife Service and the Saving Our Species program.

Brush-tailed rock-wallabies are known for their agile nature, successfully living along escarpments often in the vertical environment of rock crevices in north-facing cliff habitats. However, in recent times, they have suffered from habitat loss and predation from introduced foxes (*Vulpes vulpes*) and feral cats (*Felis catus*), as well as wild dogs. The Friends' mission is to protect these threatened animals through community awareness campaigns via social media, community events, school programs, and fundraising initiatives. With the support of other organisations, the Friends' have been able to undertake feral pest control and monitor the number of individual rock-wallabies in each of the three Kangaroo Valley colonies. Over the years, they have helped the rock-wallaby populations to increase in numbers, however they still battle to help them reach a sustainable level.

In January 2020, the Currowan bushfire crept north from Nowra in New South Wales and entered the western section of Kangaroo Valley. Unfortunately, some residents lost their homes, including the Friends' President, Chris Pryor, who has been working with the Friends' for many years. Not only did the residents of Kangaroo Valley suffer at the hands of the bushfire, so did the rock-wallabies in one of the three colonies – the 'creek colony'.

Above: National Parks and Wildlife Services field officers leading a team of experts into the burnt-out remnants of the 'creek colony' after the January 2020 bushfires. Supplementary food, consisting of sweet potato and carrots, was delivered to the brush-tailed rock-wallaby colonies.

The 'creek colony', estimated to consist of nineteen individuals, was subjected to the ferocity of the 2020 bushfires and experienced a significant loss of vegetation. In 2019, the 'creek colony' had suffered from a fire at the top of the escarpment, as well as a serious drought. Most of the remaining rock-wallaby habitat, from the 2019 fire, was wiped out in the 2020 Currowan fire. Furthermore, the local water storage system was burnt out and trees crashed onto the nearby soft-release animal enclosure. The Friends' made frequent trips to the colony to identify the number of survivors. Initially, seven were alive and well. Supplementary water and food in the form of pellets, sweet potato, and carrots were provided.

Images, collected via remote monitoring cameras, provided much-needed data on the impacts of the 2020 bushfires to the 'creek colony'. In addition, the Friends' expert team was able to locate individuals of the colony using individual identification traits (e.g. notches in ears and chest blazes). Amazingly, almost all the rock-wallabies were alive.

As a result of the bushfires, the Friends' were looking for funds to assist with supplementary feeding for all three colonies, given that the other two colonies had been severely drought-affected, even though they had been spared by the bushfires. Much-needed assistance was acquired through generous donors to assist in implementing a recovery action plan. The initial phase of the action plan included the deployment of watering stations and supplementary feeding. The Friends' implemented supplementary feeding every week to ensure the survival of the rock-wallaby colonies. It has since been found that most of the 'creek colony' did survive, except for two younger wallabies who succumbed to injuries a few weeks after the fire.

The Road to Recovery

One year has now passed since the devastating bushfires tore through Kangaroo Valley. The Friends' are seeing signs of vegetation regrowth. Thanks to the welcome rainfall throughout the winter months of June and July 2020, National Parks and Wildlife Service have noted the return of native flora species such as ferns. As natural vegetation across the valley begins to replenish, the Friends' look forward to the rock-wallaby colonies thriving once again.

Images on the remote monitoring cameras have shown that the rock-wallabies are no longer actively seeking supplementary feed, which means that they are finding sufficient feed among the natural regrowth of vegetation. Whilst there is still a long way to go, the Friends' are confident that life on the rocks will continue, and hope to see self-sustaining numbers of rock-wallabies in the future.

A remote motion detection camera at the 'creek colony' in Kangaroo Valley on the 4th January 2020, recording temperatures over 70°C in bushfire conditions.


Taxidermy displays of a feral cat (*Felius catus*) and fox (*Vulpes vuples*) used by the Friends of the Brush-tailed Rock-wallaby at school presentations and community events.

Australia's Wildfires

The Response from Sydney Wildlife Rescue

Sandra Guy

In summer 2019-2020, the world watched in horror as news emerged of mega-wildfires affecting Australia's landscapes. The fires were part of a record fire season that started in winter and lasted eight months until mid-March 2020. The last fires were finally doused by the heaviest rainfall in thirty years. Lives, property, and businesses were lost, and communities were devastated.

In New South Wales alone, some six million hectares of land was fire-affected including more than forty percent of National Park estate. Devastatingly, up to nineteen million hectares of land was fire-affected across the whole of Australia. The World Wildlife Fund estimated that nearly three billion native vertebrates – mammals, reptiles, birds, and frogs – had been killed or displaced in one of the worst wildlife disasters in modern history. The breakdown of fire-affected wildlife included 143 million mammals, 2.46 billion reptiles, 180 million birds, and 51 million frogs.

Many wildlife rescue organisations were overwhelmed by the enormity of the situation and the sheer number of animals requiring rescue and critical care. These community organisations, often staffed by volunteers and funded by donations, responded immediately, identified priorities, and offered care and expertise where it was needed most.

The blanket media coverage alerted many people to the plight of native wildlife and the enormous efforts being made by wildlife rescue organisations. Generous donations from local communities and international sources contributed significantly to Sydney Wildlife Rescue's ability to respond to the bushfire emergency and fire-affected wildlife. Furthermore, donated animal pouches, possum boxes, medical supplies, fabric material, and fuel were all essential items that supported Sydney Wildlife Rescue in their efforts to respond to animals in need.

Fortunately, Sydney escaped the harshest of fires. Consequently, Sydney Wildlife Rescue sent teams of volunteers to areas in desperate need of assistance. Sydney Wildlife Rescue's Mobile Care Unit is a van that has been retrofitted with the resources needed to provide wildlife with intensive care, when out in the field. On 11 January 2020, the Mobile Care Unit made its inaugural trip to Wandandian on the south coast of New South Wales. The volunteer carers and wildlife vets coordinated with the two local wildlife groups in the region, Wildlife Rescue South Coast and the Native Animal Rescue Group, who provided direction and knowledge of the local area which informed the response plan to the situation unfolding.

With support from Aussie Mobile Vets and Vets Beyond Borders, an emergency triage centre for wildlife was established on a carer's property in Wandandian, to assist local wildlife groups. It was an extraordinary operation with teams working around the clock. Some international wildlife groups also assisted and flew in volunteers to help rebuild wildlife rehabilitation infrastructure on carers' properties, as well as providing funds for resources such as medical supplies, food, and fabric material. Their assistance was astonishing and meant that the local wildlife groups were able to operate shortly after the fires had passed.

The Mobile Care Unit also headed west to Lithgow, New South Wales. A second triage centre was set up with the assistance of Vets with Compassion, Aussie Mobile Vets, and Doctor Howard Ralph and his team from Southern Cross Wildlife Care – a non-profit organisation that provides veterinary assistance to native wildlife at no cost.

During the fires, it was necessary to locate and capture injured and orphaned wildlife remaining on the fire grounds. Training for Sydney Wildlife Rescue members was arranged, with the New South Wales Rural Fire Service, where they learnt the skills to safely conduct 'black walks', where teams walk through a charred and burning landscape. It became apparent, on these 'black walks', that qualified and licensed darters and shooters were required to help capture and euthanise injured and suffering animals that were beyond help. The Firearms Safety and Training Council was approached and many of their members volunteered to assist the local wildlife groups. The fire had destroyed much of the local infrastructure, including wildlife care facilities and enclosures. As a result, many of the animals were brought back to Sydney for long-term care and treatment.

The downpour of rain that occurred in March 2020 was very much welcomed and flooded life back into the charred landscape. Vegetation started to recover, providing food and shelter for wildlife that had survived the fires, and Sydney Wildlife Rescue was finally able to release rehabilitated animals back into the bush.

Above: The eastern grey kangaroo (*Macropus giganteus*) orphans.

Sydney Wildlife Rescue's Mobile Care Unit and volunteer vets preparing to leave to assist bushfire-affected wildlife.

As well as assisting with rescues and acute care, Sydney Wildlife Rescue provided bulk supplies of equipment, such as possum boxes and feeding and water stations. These feeding and water stations were periodically replenished to support animals in the wild until the local vegetation recovered. Sydney Wildlife Rescue's Mobile Care Unit proved invaluable and provided immediate and high-quality on-site treatment to native wildlife; especially in remote areas where comfortable, air-conditioned treatment rooms and X-rays were hours away. The Mobile Care Unit was funded by donations to Sydney Wildlife Rescue, through the Global Giving website, and made a crucial difference to the number of animals they were able to save.

Furthermore, Sydney Wildlife Rescue arranged for delivery of veterinary care equipment and supplies to Kangaroo Island's wildlife rescue group, which was also devastated by the fires. Through a member's family contact, Sydney Wildlife Rescue was offered the spare space in the cargo hold of a private plane flying to Kangaroo Island. Being so remote, Kangaroo Island faced a unique set of circumstances – one of the worst being isolation and a lack of supplies. Therefore, the arrival of the three cubic metres of veterinary supplies was of enormous assistance to the local vets and wildlife carers.

The efforts of Sydney Wildlife Rescue's volunteers and all the supporting organisations, donating their time and resources, was monumental. They witnessed raw horror and were sleep-deprived but continued to work around the clock. They were confronted by extreme circumstances in communities that were traumatised, yet they responded with resilience, grace, and dignity. They also shared their expertise and hope with the local community, while helping to save Australia's precious wildlife.

For more information on Sydney Wildlife Rescue's wildlife recovery efforts, please visit http://www.sydneywildlife.org.au


Volunteer vets treating an eastern grey kangaroo (*Macropus giganteus*) joey with burnt feet.


A bare-nosed wombat (*Vombatus ursinus*) being treated with oxygen for smoke inhalation.

Seahorse Secrets

and Where to Find Them

Chris Hasselerharm

Chris is our 2020 Australian Wildlife Society University of Technology Sydney Wildlife Ecology Research Scholarship Recipient.

Image: Nathan Klein

There is no doubt about it; seahorses are one of the more unusual animals to be found in the ocean. They have a pouch like a kangaroo*, a prehensile tail of similar character to a monkey's tail, and a snout with enough suction capability to put a Dyson vacuum cleaner to shame.

They even hold themselves in an upright stature unseen elsewhere in the marine world. If you have ever been fortunate enough to spot a seahorse during a snorkel or dive, you may have been amazed by their unusual physique and awed by their ability to camouflage with their natural surroundings. Seahorses can change colour and even grow filaments or bumps to imitate their immediate surroundings. It is these peculiarities that have garnered seahorses a mythical like status. Torres Strait Islanders believe seahorses are a sign of good fortune, and in recent times, this omen has been passed on to divers in general. But it is partly this mythical status that has unfortunately led seahorse populations to become threatened.

Seahorses are highly sought-after for their purported medicinal properties, the aquarium trade, and as curios. Their high value and ease of capture have made them easy targets for fisherman. The seahorse trade became regulated in 2004 by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), restricting seahorse exports to those sourced legally and sustainably under CITES. Many traders of seahorses have since been unable to guarantee these conditions are met, and trade has been suspended by CITES or countries have self-imposed bans on the trade. Despite these bans, seahorses continue to be taken from the wild and traded illegally within and beyond the sourced country. Shipments are frequently intercepted, where the legality of geographic source and taxa of collected seahorses come into question. The border force's ability to enforce bans is restricted by a lack of forensic tools available to determine the provenance of shipments.

Although largely immune to the illegal wildlife trade in Australia, seahorses are still under threat. Seahorses have small home ranges, low population densities, and limited dispersal ability, which makes them particularly susceptible to anthropogenic effects. Habitat loss is the driving factor behind population declines of seahorses in Australia. For example, the loss of soft coral and sponge habitat, caused by boating and sand inundation, is linked to the eighty-three percent decrease in the White's seahorse (*Hippocampus whitei*) population at Seahorse Gardens, Port Stephens.

Seahorse is the name provided to forty-six species of small marine fish in the genus Hippocampus. Image: Arhnue Tan

Due to the seahorse's limited ability to disperse, seahorse populations are unlikely to recover without human intervention. Consequently, reintroduction programs and the restoration of vital habitat have the potential to assist the seahorses ability to disperse. Promising results have been achieved using artificial habitats, however artificial habitats are known to breakdown rapidly – in less than one year. Identifying, preserving, and rehabilitating important natural habitats for seahorses, should be prioritised and is more likely to provide a long-term solution. Given the importance of habitat to the White's seahorse, and a lack of knowledge on its diet, additional information on the dietary sources of White's seahorse across several sites and habitats is desperately required to improve the survivability of reintroduced seahorses.

The project aims to determine the diet, geographic source, and species of biological material of a seahorse, in real-time, using technology borrowed from the mining industry. The limitations and differences in dietary preferences of White's seahorse between different locations and habitats will also be examined, aiming to improve conservation outcomes for seahorses locally. Furthermore, the project's findings can be applied to the illegal wildlife trade, on an international scale, to assist conservationists and border forces in tracking individual species, identifying dietary sources, and detecting fraudulent shipments of seahorses.

* Not all species of seahorses have a pouch on their tail (abdomen). For example, pygmy seahorses are morphologically distinct from other seahorses, due to their pouch being present on their trunk (head).

About the Author: Chris Hasselerharm is a PhD candidate with the Centre for Compassionate Conservation at the University of Technology Sydney.

Australia's First Wombat Hospital

Opens in Cedar Creek

Above: L to R: Marina Kijil, Gillian Potts, Roz Holme, Katerina Skarbek, Georgia Gibbs, and Robin Crisman.

Megan Fabian

With wombats under threat from habitat loss, vehicle strikes, and mange, the new purposely built Cedar Creek Wombat Hospital is the perfect place for wombats to seek refuge and rehabilitation. On Sunday 22 November 2020, the official opening of the new wombat hospital took place. The opening was a great success, with some twenty people attending the event to celebrate a milestone in history for wombat conservation.

Guests were welcomed by the President and Chief Executive Officer of the Australian Wildlife Society, Suzanne and Patrick Medway, followed by an extended welcome from the Vice President, Associate Professor Julie Old. The President expressed her gratitude and appreciation for the fabulous work that Roz and Kev Holme, founders and owners of Cedar Creek Wombat Hospital, are implementing for the conservation of Australia's wombats. The Society was very proud to be supporting and opening, alongside Roz and Kev, such a wonderful advancement for Australia's wombats.

Speeches were followed by the cutting of the ribbon – to officially open the wombat hospital. With media onsite, the Directors of the Society, alongside Roz, took their positions in front of the wombat hospital. Surrounded by family and friends, they laid out the ribbon, and Roz, with scissors in hand, snipped through the ribbon with excitement and celebrated the difficult but rewarding journey to get to this point.

Guests were then taken on a tour of the wombat hospital and its facilities. Equipped with specialised surgical equipment and three intensive care units, the wombat hospital can provide critical care for up to ten injured or displaced wombats. From a medical washbasin and x-ray machine to a microscope and portable generator, the wombat hospital is fitted out and ready to take action to ensure Australia's wombats receive the ultimate treatment.

When the official proceedings concluded, guests were invited to continue to celebrate Australia's wombats over a cup of tea and wombat cake – the chocolatey kind of course.

Continued on Page 18 >

Wombat (*Vombatus ursinus*) Joey.

Board of Directors and Roz Holme cutting the ribbon – to officially open the wombat hospital.

Suzanne Medway being interviewed by NBN Newcastle.

Megan Fabian nursing a wombat joey.

Ken Mason with a wombat that is being rehabilitated.

L to R: Julie Old, Ken Mason, Roz Holme and Suzanne Medway with two precious wombats.

L to R: Brian Scarsbrick, Trevor Evans, Julie Old, Suzanne Medway, Ken Mason, and Patrick Medway.

L to R: Katerina Skarbek, Georgia Gibbs, Roz Holme, Marina Kijil, Gillian Potts, Kev Holme, and Robin Crisman.

Cedar Creek Wombat Hospital.

Roz and Kev Holme are not only dedicated to conserving Australia's wombats but care for other native wildlife, with the focus being on individuals that need more than routine care to get to the point of release.

Through the support of the Australian Wildlife Society, as part of the Kinder project, Cedar Creek Wombat Hospital has been able to expand its wildlife recovery program, develop its facilities, and increase its capacity for threatened wildlife, to ensure that injured or displaced animals receive superior treatment and support.

Cedar Creek Wombat Rescue Inc. and Hospital is a not-for-profit organisation and is operated solely on donations from the public and contributions from its founders Roz and Kev Holme. The Society greatly admires and is honoured to support the vital work of Roz and Kev, and the Cedar Creek team, and Australia's first wombat hospital, which will treat and rehabilitate many sick and injured animals back to the point of good health and release back into the wild.

Commemorative plaque.

Patrick and Suzanne Medway nursing a wombat whose mum was a vehicle strike victim.

A Tragedy is Taking Place
in Kosciuszko National Park

Reclaim Kosci

Kosciuszko National Park is an ancient landscape where the Snowy, Murray, and Murrumbidgee rivers spring from the ground, rugged snow-covered mountains fill the landscape, and rare alpine wildlife like the Critically Endangered northern corroboree frog (*Pseudophryne pengilleyi*) call home.

Tragically, it is now also the place where introduced horses have been allowed to populate and imperil our native species, trampling and compacting fragile soils, and carving up waterways with their heavy hooves. The last official count put Kosciuszko's feral horse population in the tens of thousands, with the management of horse numbers at a standstill.

In 2020, just a few hundred horses were removed from the park, nowhere near enough to limit or reduce the herd's untrammelled growth. And while thirty-two percent of Kosciuszko National Park was burnt by the catastrophic summer 2019-2020 bushfires the feral horse population was little affected by the fires – within weeks of the fires being extinguished, hundreds of horses were seen grazing on regrowth in the fire grounds.

A High Price to Pay

The roll call of endemic Australian species facing the risk of becoming Endangered or Extinct continues to mount. In fact, 1,805 native flora and fauna species are now listed as Threatened under Australia's conservation law – the Environment Protection and Biodiversity Conservation Act.

In Australia, invasive species, and yes, that includes feral horses, are now recognised as the key driver of native animal extinctions and they continue to drive our threatened flora and fauna closer to extinction. In Kosciuszko National Park, eleven threatened native animal species and twenty-three threatened plant species face some sort of pressure from introduced horses – whether it be from selective grazing, trampling, soil compaction, or watercourse disturbance, which leads to habitat degradation and loss.

Above: Alpine sunrays, Kosciuszko National Park. Image: Mike Bremers

The northern corroboree frog (*Pseudophryne pengilleyi*) is Critically Endangered under federal and state conservation laws and is threatened by habitat disturbance from feral horses. Image: Michael McFadden

Horses are an introduced animal that belongs in a paddock, safe in the hands of caring human owners, not in one of Australia's most loved national parks.

Tide is Turning

Two years ago, a campaign to protect Kosciuszko National Park's natural values from booming numbers of feral horses was born. Called Reclaim Kosci, it has become the flag-bearer for those who want to see the New South Wales Government not just control but reduce feral horse numbers in the park.

A key to this reduction is repealing the '*Kosciuszko Wild Horse Heritage Act 2018*' – a piece of legislation that protects feral horses in the park to the detriment of Kosciuszko's fragile ecosystems.

Spearheaded by the Invasive Species Council, Reclaim Kosci has worked tirelessly to raise awareness of the damage being inflicted on Kosciuszko National Park by introduced horses.

Now, an increasing number of Australians and decision-makers are starting to understand the impact

Horse trampling impacts the streambanks at the headwaters of the Ingeegoodbee River in Kosciuszko National Park. Image: Ian Pulsford

feral horses are having on the iconic landscape of Kosciuszko National Park and the urgent need for a management plan that reduces those impacts.

The fight to protect Kosciuszko is paying off. In 2020, leading voices from all sides of the political spectrum – federal and state, conservative and progressive – joined our calls for action.

The Federal Environment Minister, Sussan Ley, was visibly shocked at the feral horse damage she saw following an inspection of the park organised by Reclaim Kosci.

"I remember the park when this area was my electorate when I first became a member of parliament and clear differences between then and now, and the pressure of horses, is a call to action I think for agencies, state government, and people who care about the environment and agriculture and farming and the balance between the two," she said during her visit.

"So, it is all a balance. It isn't all about one versus the other, it's about looking after everyone and looking after the environment and we do have to get that balance right."

Midnight Oil frontman and environmental advocate, Peter Garrett, has also stood up for Kosciuszko. After visiting the park in December 2020, he put out an impassioned distress call. "I've spent many years in different capacities – whether as a muso, a pollie, as an environmental activist – walking around and seeing many parts of the most beautiful country on earth for me.

Billy button scenes in Kosciuszko National Park. Image: Mike Bremers

Australian National University Professor Jamie Pittock, Invasive Species Council Chief Executive Officer Andrew Cox, legendary rock icon Peter Garrett, and Invasive Species Council Indigenous Ambassador Richard Swain inspect feral horse damage in Kosciuszko National Park.

The Endangered alpine she-oak skink (*Cyclodomorphus praealtus*) is only found in the Australian Alps. Horse grazing and trampling impact its habitat. Image: Zak Atkins

Australian National University expert, Renee Hartley, shows Australia's Federal Environment Minister, Sussan Ley, an endangered alpine she-oak skink (*Cyclodomorphus praealtus*) while inspecting feral horse damage in Kosciuszko National Park.

Following an aerial and ground inspection of the northern end of Kosciuszko National Park, Peter Garrett declared an important part of our national heritage was being wrecked by the feral horse invasion in the unique alpine region.

An exclosure plot fence constructed in 1999 with protected (left) and unprotected (right) sedge and grass wetland at Cowombat Flat in Alpine National Park. Image: Ian Pulsford.

"And yet to come to this place and see the damage that's been wrought by these feral animals has broken my heart. We need to reduce these numbers urgently," he said. A flight over the park, sponsored by the Australian Wildlife Society, cemented Peter's position. "When we got off the helicopter this morning and I had a chance to look around and think about what I had seen, I was just struck by firstly, what a disaster is unfolding," he said.

Time to Reclaim Kosci

The New South Wales Government is expected to seek public comment on a new management plan for Kosciuszko's horses in the first half of 2021. It will either spell out how Kosciuszko National Park and its native inhabitants will be protected for future generations or condemn Kosciuszko to further destruction from heavy horse hooves.

As a matter of urgency, the New South Wales Government must reduce the impact of horses in the national park and begin the urgent work of restoring the catchments' slopes and trampled alpine wetlands.

We encourage all those who care about the natural biodiversity of Kosciuszko National Park to have their say when the plan is released and urge the New South Wales Government to listen to the science and implement an effective and humane horse management plan. For further information on Reclaim Kosci please visit reclaimkosci.org.au

A Message From the Editor

The Society is proud to financially support the Reclaim Kosci project which aims to protect Australia's native wildlife from invasive species such as the feral horse.

Feral horses are not unique to Kosciuszko – they are found in eleven New South Wales National Parks. Here, horse trampling to streambanks is evident in Barrington Tops National Park.

Australian Wildlife Society
University Research Grants

INSTRUCTIONS FOR APPLICANTS

The Australian Wildlife Society University Research Grants are scholarships offered to honours or postgraduate students at Australian universities. Each year, ten $1,500 grants are awarded. **Applicants must be a member of the Society,** student membership is free and you can join through our website www.aws.org.au. Please send a copy of your student ID to info@aws.org.au

Grants are available for research projects of direct relevance to the conservation of Australian wildlife - plant or animal. Grants may be used for the purchase of equipment and consumables, travel expenses related to field research, or attendance at conferences at which you are presenting your work. The grant is paid directly to the student.

PREPARING YOUR APPLICATION FOR A GRANT

Applications should be a maximum of 3-4 pages (12 point font), including a brief CV and should be set out under the headings below (a reference list is not required).

APPLICATIONS EXCEEDING FOUR PAGES WILL NOT BE CONSIDERED.

Introduction: Briefly introduce the background to your research topic, specify the project's aims, and outline its importance to the conservation of wildlife.

Methods: Briefly outline your proposed methodology. We require only sufficient detail to demonstrate that your aims are achievable. Remember that the assessors may not be familiar with your field of research. You must also indicate that you have obtained (or at least applied for) any relevant research licences, permits or approvals (including animal ethics).

Schedule: Outline a proposed timeframe for the completion of your project, listing major milestones, including the submission of a final report to the AWS.

Budget: Itemise the expenses involved in conducting your research. Any funds already secured from other sources must also be declared. (This will not reduce your chances of success, provided there are necessary items in your budget that are not yet funded).

Brief CV: The final page of your application should consist of a short CV, which should demonstrate your ability to produce results of a high standard within a limited timeframe. Also include the details of two referees who can comment on the proposed project, one of whom should be your academic supervisor. A current postal address is to be provided.

Please prepare your application as a single 'Word' document, and submit it as an email attachment to info@aws.org.au. For convenience, it would be helpful to name your file according to the format: 'Your Name AWS Grant Year', e.g. 'Joe Bloggs AWS Grant 2020'.

CLOSING DATE: APPLICATIONS ARE DUE BY 31 MAY EACH YEAR.
APPLICANTS WILL BE NOTIFIED BY MAIL IN JULY.

CONDITIONS OF SPONSORSHIP

Recipients of Australian Wildlife Society grants will be requested to acknowledge the Society's contribution in all publications and presentations arising from their project. In addition, recipients will be required to submit a brief report on their project to the Society for use in the Society's magazine, *Australian Wildlife.*

Opening of a New National Office

Megan Fabian

The Australian Wildlife Society held the official opening of its new national office on Tuesday 1 December 2020 to help cope with its expanding work in wildlife conservation across Australia. The new national office at 29B/17 Macmahon Street, Hurstville was officially opened by the Mayor of Georges River Council – Councillor Kevin Greene. Guests were welcomed with music from the Mason Trio and, after the formal proceedings took place, were invited to mingle over canapés and a cup of tea.

The Mayor, a local to the Georges River Area for over fifty years, welcomed the Society to the region and was excited that, after 111 years, our Society had selected Hurstville as its home. The President of the Society, Suzanne Medway, who was born in Hurstville, said "the newly established national office is situated in a tree-lined street and will provide a permanent office for the Society's two staff members, and ten volunteer directors. The team works together to achieve wildlife conservation outcomes and is dedicated to the conservation of Australia's national programs for the conservation of wildlife through environmental education, advocacy, and involvement of the community."

The Mayor is looking forward to a strong relationship between the Society and Georges River Council and expressed his commitment to the environment and the local community. The Mayor highlighted that Council would continue to encourage native wildlife to the local area, with another revegetation project expected to be implemented shortly, along Forest Road. Wrapping up his speech, the Mayor congratulated the Society again on such a wonderful and prosperous achievement and emphasised that he is dedicated to providing an environment that people can enjoy and be comfortable in.

Above: L to R: Ken Mason, Wayne Greenwood, Suzanne Medway, Kevin Greene, Julie Old, Patrick Medway, Philip Sansom, and Stephen Grabowski.

The Society is delighted to occupy a region where its local Council values the environment, as seen in the leading statement of their 2050 Vision: “A progressive, environmentally and culturally rich community enjoying a unique lifestyle.” The Society is also looking forward to a strong relationship with Georges River Council and its Senior Environmental Officer, Lachlan Prentice, working together to protect Australia’s precious wildlife for future generations.

Of particular interest, is the conservation of Georges River Koala Reserve and grey-headed flying-fox colony, which is using Myles Dunphy Reserve as a camp and roosting site. Unfortunately, both species are threatened, and their populations are in decline due to habitat loss and extreme heat events. Leading up to summer, and on days over 40 degrees Celsius, young flying-foxes can become heat-stressed and fall from trees, and koalas can venture across busy roads in search of water. The Society asks the community to please keep an eye out for wildlife. If you see an injured or dead animal, please report it to Georges River Council on 02 9330 6400 and WIRES on 13 000 WIRES.

We are excited to see what the future will bring and what achievements the Society will accomplish. If you are in the local area, we welcome you to visit the new national office and initiate a conversation about wildlife. We also encourage everyone to become a member of the Society to keep up to date on the collective work being promoted nationally. By becoming a member, you are also helping to conserve Australia’s unique and precious wildlife for future generations.

Suzanne Medway, President, with Councillor Kevin Greene, Mayor of Georges River Council, unveiling the official plaque of the new national office.

L to R: Ken Mason, Suzanne Medway, Kevin Greene, Philip Sansom, and Patrick Medway.

L to R: Paul, Noel, and Ken Mason trio performing an ensemble for the official opening.

2020 Australian Wildlife Soc

L to R Pam Fields, Basil Fawlty, and Julie Upton.

L to R Brain Scarsbrick, Patrick Medway, Wayne Greenwood, Trevor

L to R Basil Fawlty, Manuel, and Sybil Fawlty.

L to R Julie Old, Wayne Greenwood, Brain Scarsbrick, Philip Sansom, Sisilia Citrajaya, Cindy Fabian, and Shirley Kelly.

iety **Christmas Luncheon**

Julie Old, Ken Mason, Suzanne Medway, Evans, and Philip Sansom.

L to R Cindy Fabian, Patrick Medway, Megan Fabian and Shirley Kelly.

L to R Cindy Fabian, Sybil Fawlty, and Shirley Kelly.

L to R Margaret McGurgan, Ken Mason, Jackie Holt, Michelle Anisseh, Patrick and Suzanne Medway, Justine Pacampara, Hollie Deste, Pam Fields, and Julie Upton.

Leap into Hunter Wetlands

to See the Green and Golden Bell Frog Research

Doctor Peter Nelson

This time last year, all but one of the Hunter Wetlands Centre Australia's (HWCA) wetlands was bone dry as the drought pounded them into dust. Then, just as the rains arrived; the ponds began to fill, wildlife returned, and everything turned green again, along came COVID-19 and HWCA were forced to close their doors for several months.

HWCA has been restoring and maintaining a forty-five-hectare site on the outskirts of Newcastle, New South Wales for more than thirty-five years. HWCA operate a very successful Visitor Centre and welcomes approximately thirty thousand visitors, including seven hundred members, each year. Furthermore, over seven thousand school children visit the Wetland Environmental Education Centre facility on site to learn about some of Australia's unique native wildlife.

HWCA started as an effort to restore the degraded wetlands in the region and conserve the large egret rookery on site. Since its inception, the conservation of Australia's threatened and endangered species has always been a core activity of HWCA. As well as restoring habitat on site, and in other areas throughout the Hunter estuary, they have conducted programs and research to assist the conservation of native species including the freckled duck (*Strictonetta naevosa*) and magpie goose (*Anseranas semipalmata*), which were once plentiful in the Hunter region, along with many plant species and, of course, frogs.

HWCA have also strengthened their education, research, and conservation ties with their neighbour - the University of Newcastle. Doctor Alex Callen, her colleagues, and students in the Conservation Biology Research Group, have been conducting research, on HWCA grounds, on the causes of the dramatic decline in the endangered green and golden bell frog (*Litoria aurea*) due to the deadly chytrid fungus (*Batrachochytrium dendrobatidis*). The University conducted a successful

Centre Australia Project

breeding program at HWCA several years ago, but the research facilities, constructed on site, had been languishing since the program finished. However, the research facilities are now refurbished and are being utilised again.

The Green and Golden Bell Frog

Green and golden bell frogs look a lot like other well-known tree frog species, aside from the iconic brassy-golden patterns on their green skin. The variation in pattern is amazing. Some individual frogs can be almost a dark brown, with very little green on them, while others a pale pea-green with light golden patches. Some are almost all green and some individual frogs have a deep olive amongst the brassy bands. Interestingly, these colours are not fixed. Scientists have observed individual frogs can change colour over the space of a few hours. It is thought that this change in colour is related to inactivity; they seem to become lighter with the more activity they carry out. It is more likely that you have heard a green and golden bell frog than seen one. As in all frogs, it is the male of the species who 'call'. Have you ever heard a motor bike changing gears in slow motion? That is a little like the call of our friend – the green and golden bell frog.

Frogs are amphibians and need wet environments to breed and keep their skin moist, which is essential to their survival. When they are tadpoles, they can only survive in water. Green and golden bell frogs are a tree frog species, but they spend most of their time a little closer to the ground. They are thought to be largely ground dwelling; in grasses, bushes, and vegetation surrounding still water bodies. However, there are theories that trees may still form an important part of their habitat. It is thought that they need a variety of habitats to survive. Frogs are cold-blooded and mostly nocturnal; this means they need to regulate their own body temperature. Green and golden

Above: The Hunter Wetlands Centre Australia Visitor Centre.

bell frogs are one of the few Australian frogs that can be seen basking in the sun and are active during the day and night.

Population Decline

It is hard to believe that green and golden bell frogs were once the most common frog in south eastern Australia. They are now listed as Endangered in New South Wales and classified as Vulnerable on a national scale. They now only exist in a few coastal pockets. Locally, there are substantial populations on Kooragang Island, Terrigal Wetlands, and Sydney Olympic Park amongst others, but they used to be widespread and familiar. There are several factors contributing to their decline:

1. Land clearing and habitat loss – frogs tend to live in freshwater wetland areas which have historically been undervalued and dredged or filled in for development. Urbanisation also fragments frog populations and makes it difficult for frogs to find all the spaces they need for the different parts of their life cycle;
2. Climate change – the changing climate is altering everything, and the wetland areas frogs depend on are most susceptible to drying out;
3. Threats to biodiversity – frogs are a signal of the robustness of an ecosystem;
4. Domestic pets – kill adult frogs;
5. Introduced fish – the mosquito fish (*Gambusia affinis*) was introduced into Australia to help control mosquito populations; it did not work. The mosquito fish do a better job at eating green and golden bell frog eggs and tadpoles and researchers have found that if there are mosquito fish in the area, very soon green and golden bell frogs will disappear from that area; and
6. Infectious diseases – such as chytrid fungus which have decimated frog populations.

The Deadly Chytrid Fungus

Despite frog's skin having amazing antiviral and antibacterial properties, they are still extremely vulnerable to some pathogens such as fungal disease. Chytridiomycosis is a disease caused by the aquatic fungus *Batrachochytrium dendrobatidis* which attacks keratin in the frog's skin and persists in temperate freshwater environments.

Over the last few decades, it is thought to have caused extinction, or severe decline, in more than two hundred species or forty percent of the diversity of amphibians around the world. In Australia, we have already lost at least four species to this disease. Unfortunately, the green and golden bell frog seems to be particularly affected by this pathogen.

All frog species in Australia are affected by chytrid and interestingly, it is not fatal to every species which means it is spread even more. If there are other frog species in a habitat that are carrying the disease, it is only a matter of time before the green and golden bell frog is exposed. Once the water in a pond is infected it can stay there forever. There is currently no known treatment or control method for this invasive pathogen.

In Australia, scientists are trying to work out why particular species like the green and golden bell frog and the two species of corrobboree frogs seem to be so badly affected, while other species are not affected. Research is being conducted in the sites green and golden bell frogs occupy and are thriving, and why some areas seem to offer sanctuary. Interestingly, some of these locations are places that would be thought of as toxic or inhospitable such as Sydney Olympic park and Ash Island in the Hunter River estuary. The speculation is that these environments may be inhospitable to the fungus so frog populations can persist here, even though the habitat is not ideal. More research needs to be conducted and HWCA are proud to be playing a role in these investigations.

HWCA are working closely with the Conservation Biology Research Group at the University of Newcastle to answer some questions about why frogs are disappearing and what can be done about it. HWCA have dedicated funds to refurbish the isolation ponds on their property, to research the relationship between habitat and the prevalence of disease, chytrid fungus, in green and golden bell frog populations.

The new green and golden bell frog educational sign, kindly donated by Australian Wildlife Society.

Research Program

Scientists are conducting research at HWCA by closely monitoring and studying different aspects of the populations that survive. They use these observations to develop propositions. They then create experiments to test these propositions in controlled environments. Doctor Callan and her team want to answer the following primary questions:

1. Can elements of wetland habitats influence the prevalence of disease in frog populations? In other words, are there things about the frogs habitat which make it more or less likely for diseases like the chytrid fungus to infect the frogs which live there; and
2. Could trees help? The researchers have created a specific environment in which to investigate this question. Just across the canoe channel, six ponds have been created, three with trees around them and three without. These ponds are separated by frog-proof fences.

Green and golden bell frog tadpoles, from the captive breeding program at the University of Newcastle, were evenly distributed among the ponds in late 2020. The researchers will conduct regular surveys and closely monitor the health of the populations in each of these ponds, collecting and analysing data to try and find the answers to these questions. We hope this research will lead to important advances in understanding innovative solutions to help sustainably manage these ecosystems, and make sure the green and golden bell frog can survive and thrive within a healthy ecosystem.

HWCA and the University of Newcastle have successfully reintroduced green and golden bell frog populations back to the wild in the past. The current study looks at trees and how the frogs use them in the wetland. Will the use of trees affect the presence of the fungus in the frogs? The answer to this question is yet to be determined. The researchers are also investigating the thermal properties of different microhabitats and whether they are used differently by frogs with a different infection status.

The premise is that frogs use trees, if they are available, and can spend less time in contact with a pond or moist soil, where they would be exposed to the pathogen. If the premise is correct, and the presence of trees and their use by frogs results in less fungus infections, then incorporating trees into man-made and rejuvenated wetland environments, could be an important means to help the green and golden bell frogs survive.

Through the support of the Australian Wildlife Society, Hunter Wetlands Centre Australia was able to install a new educational sign adjacent to the green and golden bell frog research area. The sign details the work being implemented to help conserve the green and golden bell frog and encourages visitors to take action to help protect this precious species.

For further information about Hunter Wetlands Centre Australia, and the research being conducted at their site, please visit their website www.wetlands.org.au

The green and golden bell frog (*Litoria aurea*).

Aerial view of the research frog ponds.

Hunter Wetlands Centre Australia volunteers repairing the frog-proof fences at the research ponds.

Wildlife and Regional Community Groups Hope

Kerrie Allen

Australian Wildlife Society and Regional Victorians Opposed To Duck Shooting (RVOTDS) have installed a new billboard in Gippsland, Victoria, to help get their message across as holiday-makers travel from Melbourne to Gippsland over the Summer period.

RVOTDS spokesperson, Kerrie Allen, said "Many people travelling from Melbourne to Gippsland over the holidays are not aware that, between March and June each year (duck-hunting season), the stunning waterways around Gippsland turn into warzones. Birds are killed and permanently wounded, non-feathered families are traumatised, tourists are put off visiting areas of impact, and businesses are affected. It is time the Victorian Government listened to the majority of Victorians who oppose this outdated minority activity that causes so much damage to more than just our native birdlife."

The President of the Australian Wildlife Society, Suzanne Medway AM, said "the eight so-called game species that can be shot during duck shooting season are protected native waterbirds for nine months of the year. The game duck such as the pacific black duck (*Anas superciliosa*), grey teal (*Anas gracilis*), hardhead (*Aythya australis*), Australian shelduck (*Tadorna tadornoides*), pink-eared duck (*Malacorhynchus membranaceus*), wood duck (*Chenonetta jubata*), blue-winged shoveler (*Anas rhynchotis*), and chestnut teal (*Anas castanea*) are an integral part of Australia's ecosystem. There is no scientific or environmental reason for allowing these beautiful waterbirds to be shot."

Shooters, using shotguns, inflict horrific injuries to these gentle and defenceless waterbirds. When a shooter fires, pellets spread, and birds are often shot through their wings, eyes, feet, or body. These include swans (which mate for life), avocets, herons, and many other species, including Australia's rare and threatened freckled duck (*Stictonetta naevosa*). These birds are precious and unique to Australia.

"Duck shooting is not a sport. It is a cowardly, violent, and anti-social act. Sport is an even competition between humans such as football, hockey, tennis, athletics, etc. Waterbirds cannot defend themselves, let alone fight back against shooters armed with powerful weapons, dogs, whistles, and decoys. The Australian Wildlife Society believes that duck shooting is a one-sided cowardly activity" Suzanne said.

Each year, the state labour Government services a small minority of duck shooters by declaring a duck season. The Andrew's Government continues to declare a season despite the prolonged drought. The latest Government report shows even drought-breaking rains have not helped bird numbers which are on a significant long-term decline.

The Victorian Premier even goes so far as to artificially fill certain wetlands to attract birds for shooters.

We wish to express our anger that the Government still allows this brutal slaughter of native waterbirds to continue, especially because of the extreme cruelty involved.

New Billboard Will Help Communities be Heard

This year, a coalition of forty-three business, union, environmental, and wildlife groups called for recreational duck shooting to be abolished, however the Government has not yet responded.

Australia's native waterbirds have declined seventy percent since the 1980s. With a changing climate and drought predicted to intensify, it is imperative we protect our native birdlife from recreational hunters. Hundreds of thousands of our native waterbirds are reported 'harvested' each year in Victoria by shooters, even in 'restricted' seasons. These numbers do not include birds that are shot and left behind, including protected species found each year by members of the public.

Duck shooting is also a matter of safety, social, and economic impact to Victorians, particularly regional areas. More people live around the waterways now than they did in the 1950s and more people are interested in boating, kayaking, birdwatching, and bushwalking – which are hampered by unmonitored shooters in close proximity.

Then there is the issue of animal cruelty. As ballistic trajectory experts have warned, at least one in four birds shot will not be killed outright, even by the best shooters, but only wounded, flapping away to die slow painful deaths. This is obviously unacceptable in a modern society.

It is time to follow the lead of other progressive states who have banned recreational duck shooting and allow rural Victoria to benefit from nature-based tourism such as the booming birdwatching business.

An injured pink-eared duck (*Malacorhynchus membranaceus*). Image: Coalition Against Duck Shooting

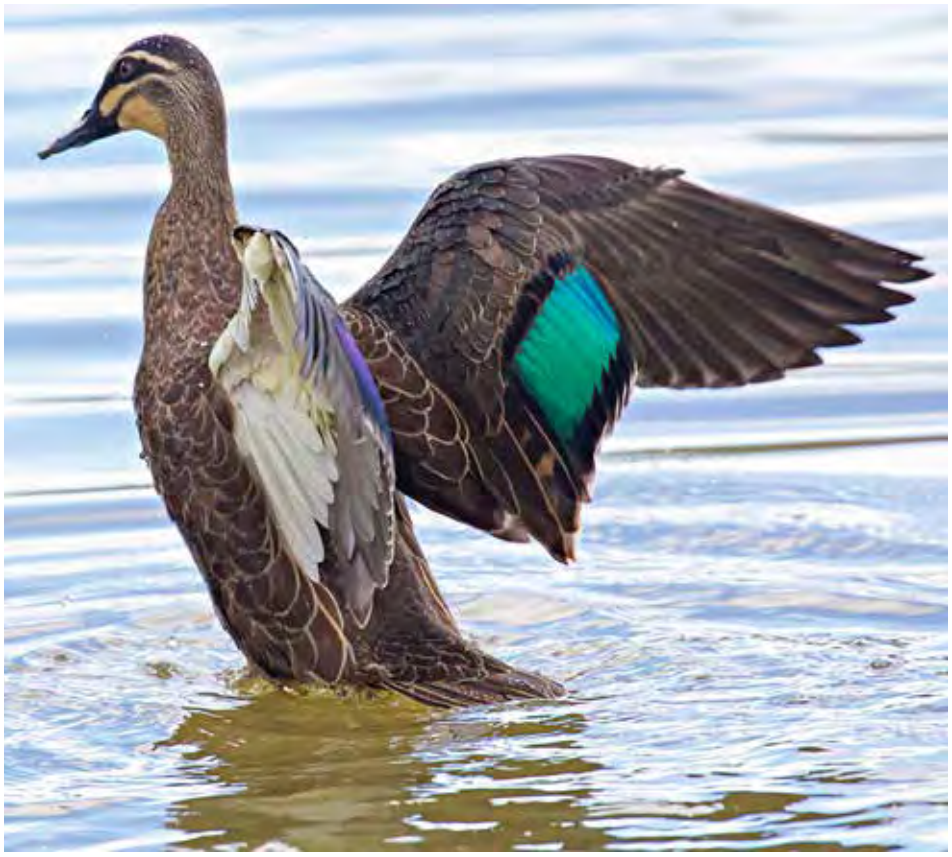
A freckled duck (*Stictonetta naevosa*) at Serendip Sanctuary. Image: Eleanor Dilley

Other state Governments have banned recreational duck shooting such as Western Australia (1990), New South Wales (1995), and Queensland (2006). However, duck shooting persists in Victoria, Tasmania, and the Northern Territory.

Every October for over thirty-seven years, expert independent researchers have surveyed wetlands and waterbirds across eastern Australia. These surveys have built up one of the country's most important long-term data sets on the health and biodiversity of our river and wetland environments. Up to two thousand wetlands and rivers are surveyed, observing up to fifty different waterbird species, including threatened species. Sadly, data shows a continued long-term decline in total waterbird abundance and breeding. The 37th (2019) survey showed significant long-term declines in all major indices and the 'wetland area index' was the lowest ever recorded since the surveys began. Sadly the 38th (2020) survey, just recently completed, shows even fewer birds than the last survey.

As an ongoing and preventable wildlife conservation matter, the Australian Wildlife Society and RVOTDS call for duck shooting in Victoria, and other states, to be banned, and ask that nature-based wetland tourism is introduced to help regional towns.

RVOTDS is a not-for-profit community group which incorporated in April 2018. Its mission is to not only be a voice for native waterbirds, but the growing number of residents and businesses in rural areas adversely impacted by recreational bird shooting nearby. For further information, please visit regionalvictoriansotds.com



A Pacific black duck (*Anas superciliosa*) at Jells Park, Victoria. Image: Eleanor Dilley

Take Action

There are many ways in which you can help to protect Australia's native wildlife, including our precious waterbirds:

1. Volunteer your time – RVOTDS rely on volunteers to help with a variety of wildlife conservation activities to help protect Australia's native waterbirds. If you would like to help, please visit their website (regionalvictoriansOTDS.com) and complete their volunteer application form;

2. Stay informed – sign up to receive the RVOTDS newsletter or become a member of the Australian Wildlife Society to keep up-to-date with the collective work being promoted state-wide and nationally;

3. Send a letter to your Ministers – help advocate for the protection of Australia's native and threatened birdlife by visiting RVOTDS's website and signing their template letter, or create and send a respectful letter of your own; and

4. Donate – if you do not have the time to volunteer or write a letter but would still like to provide support in some way, why not donate to help the organisation of your choice achieve wildlife conservation action.

Can the Absence of the Dingo Lead to a Significant Transformation of Arid Vegetation?

Nicholas Chu

Nicholas is our 2018 Australian Wildlife Society University of New South Wales Wildlife Ecology Research Scholarship Recipient.

Ecosystems depend on apex predators to create ecological balance; however, they have been historically persecuted as they present a risk towards the livelihoods and safety of people. In many places around the world, the apex predator has been culled, which has created significant ecosystem-wide changes and an overall decline in biodiversity.

In Australia, dingoes (*Canis lupus dingo*) are the native apex predator, and they are still actively culled today. In regions where the dingo has become functionally extinct, there has been a cascading effect, where animals from lower trophic levels experience alternating increases and decreases in population. For example, with the dingo being the primary apex predator and population regulator of the kangaroo the removal of dingoes from an ecosystem that contains kangaroos will affect kangaroo populations – creating an increase in numbers as their predator is no longer present. As kangaroos become overabundant, this increase leads to the overgrazing of vegetation palatable to those kangaroos. Overgrazing causes progressive degradation of soil structure and, in grazed sites, potential regrowth is impeded in periods following rainfall due to a loss of soil nutrients.

But where do these nutrients go? Kangaroos are known to be vectors that transport nutrients across landscapes by consuming, moving, and egesting waste/nutrients. While this interaction is a feature of all ecosystems that contain herbivores, the overabundance of kangaroos may result in nutrients being unsustainably moved from grazing sites (i.e., swales) to resting sites (i.e., mulga trees), especially in a semi-arid environment that has limited supply/access to water and nutrients.

The project investigated whether the overabundance of red kangaroos (*Osphranter rufus*) can alter the distribution of 'productivity hotspots' in an arid environment mediated by the presence or absence of mistletoe. The project

Above: L to R: Nicholas Chu, Raimundo Garib, and Matias Garib collecting soil samples and seeking shade beneath a mulga tree (*Acacia aneura*) infected with pale leaf mistletoe (*Amyema maidenii*).

Red kangaroos (*Osphranter rufus*) resting in the shade.

examined the resting behaviour of red kangaroos and predicted that the kangaroos would preferentially rest beneath mulga trees (*Acacia aneura*) infected with the pale leaf mistletoe (*Amyema maidenii*) as they provide more adequate shade. The project predicts that this type of resting behaviour would lead to nutrients being disproportionately delivered to these trees with mistletoe. The project argues that the strength of this interaction would be more significant in apex predator-free environments, as red kangaroos occur in a higher density and are required to move less often due to the loss of fear of predation.

So far, the project has conducted a mistletoe removal experiment and has shown that mistletoes create a cooler understorey microclimate and that red kangaroos preferentially rest beneath trees where mistletoes are present, when compared to where mistletoes are removed. To determine whether this increase in red kangaroo activity equates to an increase in soil nutrients, the project will utilise plant-root simulator probes that passively uptake plant-available nutrients mobilised by water.

The results of the project seek to describe a mechanism for how culling the dingo can lead to kangaroos transforming the vegetative landscape, beyond the immediate effect of overgrazing. The project also offers additional insight into how mistletoes that are previously underappreciated as being ecologically important can structure species interactions and more broadly influence ecosystem processes and functioning.

Pale leaf mistletoe (*Amyema maidenii*) parasitising a mulga tree (*Acacia aneura*).

About the Author: Nicholas Chu is a PhD student at the University of New South Wales School of Biological, Earth and Environmental Sciences

The Superb Lyrebird

Singer, Dancer, and Engineer

Alex Maisey and Doctor Pamela Fallow

The superb lyrebird (*Menura novaehollandiae*) has long been a beloved symbol of the forests of eastern Australia, where it inhabits the forests of the Great Dividing Range from the Queensland border to south Gippsland, Victoria. Only recently have we begun to understand the critical role the lyrebird plays in sustaining and protecting forest ecosystems.

Recent research by La Trobe University has revealed that lyrebird activity can reduce the fuel available to bushfires, potentially altering bushfire behaviour. Now, La Trobe University and BirdLife Australia have joined forces to understand the impacts of the 2019-2020 bushfires on this important species in a bushfire recovery project funded by World Wildlife Fund Australia.

The superb lyrebird is world-renowned for its singing and sound mimicry. It shot to fame in Sir David Attenborough's *Life of Birds* series, where a male lyrebird was recorded producing a variety of human-origin sounds, such as camera clicks, car alarms and chainsaws. While wild lyrebirds rarely produce these human-origin sounds, their powers of mimicry are unmatched in the natural world. It is not uncommon for a male lyrebird to reproduce the songs of over twenty other species of birds and mammals in his repertoire.

The male lyrebird's courtship display is one of the most beautiful and complex of any Australian bird. Its large feet combined with the male's long lyre-shaped tail allows it to achieve great beauty while maintaining an undeniably comical appearance.

In the winter and breeding season, the male constructs several 'display mounds' upon which he performs his courtship ritual. He clears a carefully placed stage in the forest, surrounded by dense foliage, and with ample light to illuminate his performance. When held at rest, the male's tail trails behind the body, its dark brown and grey tones blending into the gloomy forest floor. However, if a female approaches his territory, he will race to a nearby display mound and transform himself in a dazzling display; inverting his tail forward and over his body to present a shimmering, silvery-white veil, framed by two elegant arching 'lyrate' feathers, patterned with deep chestnut and fading to white along the shaft of each feather. Rhythmic dance moves are accompanied by a melodious song in a sophisticated and coordinated sequence, perfected by many years of practice.

In addition to this impressive list of talents, the lyrebird has a lesser-known yet vitally important talent as an 'ecosystem engineer'. Ecosystem engineers are species that change the physical environment in ways that impact other species living in the same habitat. Species that 'engineer' habitats are usually very important for keeping the ecosystem healthy. The lyrebird uses its large, strong claws to dig up invertebrates from the forest floor. In doing so, the lyrebird leaves a trail of overturned soil in its wake, burying leaf litter and creating a mosaic of micro-

Above: A male superb lyrebird in his courtship display.

Morning sun filters through Mountain Ash eucalypts in Victoria's central highlands.

habitats. The over-turned soil allows the forest floor to be exploited by smaller organisms, such as centipedes, mites, and worms. Lyrebird foraging also benefits plant communities. By disturbing litter, it allows light to stimulate unearthed seeds, while some larger plants are dug out of the ground, maintaining open areas on the forest floor.

In research recently published in the scientific journal *Ecological Applications,* La Trobe University investigated the physical changes to ecosystems caused by lyrebird foraging. The most striking finding was the sheer volume of work these soil-shifting songsters undertake. In a single year, throughout Victoria's central highlands, lyrebirds displaced a whopping 155 tonnes of litter and soil per hectare, per year. This measure relates to the average *population* of lyrebirds in this region. To estimate how much material a *single* lyrebird could displace in a year, the researchers went to Sherbrooke Forest where the population size could be estimated, thanks to citizen scientists who survey the birds there each year. The calculation equated to approximately 350 tonnes per bird, per year – a truly staggering figure. No other land animal on earth has been shown to move as much soil as the lyrebird. The modification of litter has also been shown to change the behaviour of bushfires; by burying litterfall, lyrebirds effectively remove material that would otherwise fuel the bushfire. Such foraged areas serve as small and numerous bushfire breaks.

The mega-bushfires of 2019-2020 have burnt deep into Australia's ecological heritage. Following years of severe drought, bushfire-sensitive rainforest habitats were intensely burnt, potentially for the first time in their history. Billions of animals were estimated to have perished across the continent. Many populations of mammals, reptiles, amphibians, fish, plants, invertebrates, fungi, and birds suffered significant losses to their habitat, the lyrebird among them. While the Australian continent has evolved over millennia to cope with bushfire, our forests have never experienced so many bushfires and such short periods between bushfires. Bushfire frequency is a critical factor determining whether bushfire-sensitive rainforest communities may recover, and these areas are critical for breeding lyrebirds.

To understand the impacts of the catastrophic 2019-2020 bushfire season on the southern subspecies of superb lyrebird, BirdLife Australia and La Trobe University have partnered on the Superb Lyrebird Bushfire Recovery Project funded by World Wildlife Fund Australia. Although lyrebirds might survive a bushfire front by dashing into wombat burrows, splashing into streams, or even hiding from the flames in mine shafts or caves, survival after a bushfire is tough. Food is scarce in burnt landscapes and wildlife are especially vulnerable to feral predators such as foxes and feral cats, which move into burnt areas after a bushfire – to take advantage of good pickings. Feral deer travel vast distances after a bushfire, destroying rainforest

A male superb lyrebird in full courtship display.

habitats with their bad habits such as rubbing their antlers on, and subsequently ringbarking trees, eroding banks of gullies, and eating any remaining understory vegetation – which would normally provide shelter for small animals, leaving native animals further exposed to predators. Twelve months following a bushfire is therefore likely to be most challenging for lyrebirds.

One essential task is to determine how much habitat has been burnt and whether lyrebirds are still active in these areas. Sadly, the project has calculated that over half of all mapped rainforests inhabited by the southern subspecies of lyrebird have been impacted by bushfire. These rainforest areas represent critical breeding habitat and summer foraging refuges when slopes dry out and invertebrates are scarce. To protect these special and important areas of the landscape, bold actions and preemptive solutions to bushfire prevention may be needed.

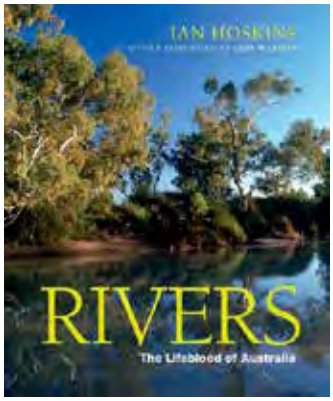
The ultimate objective of the project is to identify parts of the landscape that function as refuges from bushfire for lyrebirds. The project will investigate lyrebird activity in areas of varying bushfire severity, across broad landscapes, to build statistical models that help to determine the important habitat characteristics that enable lyrebirds to persist in the face of bushfire. Survey work for this aspect of the research is ongoing, with generous assistance from many BirdLife volunteers who care deeply about the lyrebird's future. Lyrebirds must contend with the threat of direct mortality from intense bushfires and reduced survival in a post-bushfire environment, while their long-term population viability may hinge on the capacity for ecosystems to recover. These threats pose significant challenges to lyrebirds, and we must understand them if we are to ensure the lyrebird survives into the future. Ultimately, the project will be essential in informing conservation decisions to better protect lyrebird populations in the face of a warming climate and the associated increase in bushfire frequency.

A male superb lyrebird pauses as he reaches an elevated singing post.

A colour-banded male superb lyrebird displaying in Sherbrooke Forest, Victoria.

A male superb lyrebird calls from his blackened territory at Mallacoota, Victoria after the bushfires swept through.

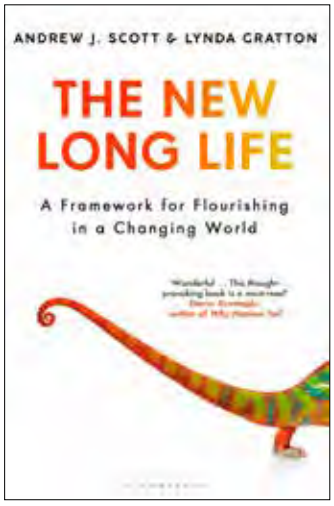
Book Reviews



Rivers: The Lifeblood of Australia - *Ian Hoskins*

Australia is the second driest continent on the planet, yet it is covered with waterways, from the Ord in Western Australia to the crocodile rivers of Kakadu. Australia's waterways are a means of transportation, sources of power, and givers of life. More than any other part of the Australian landscape, rivers demonstrate the interconnectedness of life. Of the waters and wetlands that remain, most of which are connected to rivers, sixty-five are listed as Ramsar Wetlands of International Importance – waterways that nature and humans depend on for existence. *Rivers* explores our complex connections to water and the intrinsic value it provides our country.

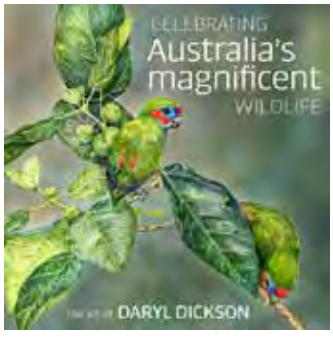
Publisher: NLA Publishing | RRP: $49.99



The New Long Life - *Andrew J. Scott and Lynda Gratton*

The New Long Life is a practical guide to how we can positively adapt to a changing world. Human progress has risen to great heights, but at the same time, it has prompted anxiety about where we are heading. One thing is clear, advances in technology have not been matched by the necessary innovation to our social structures. In an era of unprecedented change, we have not yet discovered new ways of living. However, the authors have created a post-pandemic road map for us all. Drawing from the fields of economics and psychology, the authors offer a simple framework, based on three fundamental principles to give readers the tools to navigate the challenges ahead.

Publisher: Bloomsbury | RRP: $29.99



Celebrating Australia's Magnificent Wildlife - *Daryl Dickson*

Witness the ancient tropical forests and majestic landscapes of northern Queensland, Australia — home to some of the world's rarest and most fascinating species. With over 107 paintings, from the northern quoll (*Dasyurus hallucatus*) to the mahogany glider (*Petaurus gracilis*), see a variety of Australia's wildlife contained in one magnificent book. The author's passion for the conservation of wildlife and wild places has informed and inspired her stunning work. She highlights the natural beauty of wildlife that deserves to be protected and describes each individual species, what it needs to flourish, what environment it lives in, and its behavioural characteristics. This beautifully designed book, featuring a lifetime of artworks, is an essential addition to everyone's coffee table.

Publisher: Exisle Publishing | RRP: $55.00

The Carbon Club - *Marian Wilkinson*

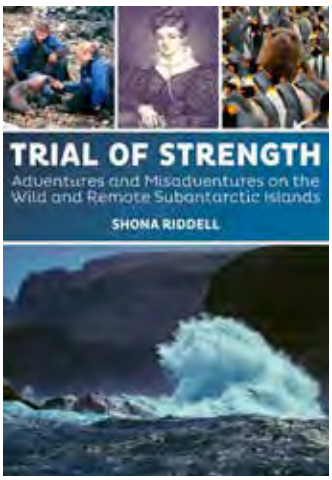
The Carbon Club provides an inside story of how a network of influential climate sceptics, politicians, and business leaders fought to control Australia's response to the climate crisis and reveals the truth behind Australia's two decades of climate inaction. As the climate crisis threatens more extreme bushfire seasons, droughts, and floods, many Australians are demanding their leaders answer the question: "Why didn't you do something?" The more climate science was questioned, the more politicians lost the imperative to act. The sustained success of the carbon club, over two decades, explains why Australian governments failed to deal with the challenge of climate change.

Publisher: Allen & Unwin | RRP: $32.99

Wild at Heart - *Miriam Lancewood*

Wild at Heart is the captivating sequel to Miriam Lancewood's first book and international bestseller *Woman in the Wilderness*. *Wild at Heart* is the author's story of a quest for a simple life, unconstrained by society's norms. Miriam and Peter leave New Zealand to explore other wild places. They walk two thousand kilometres through the forests of Europe and along the coast of Turkey, mostly camping under trees and cooking by fire. But when they moved on to the Australian desert, they are met with disaster. *Wild at Heart* is a riveting story about life, death, and courage, while exploring the wonders of wild places.

Publisher: Allen & Unwin | RRP: $32.99



Trial of Strength - *Shona Riddell*

They can be brutally cold, rarely visited, and crowded with wildlife. They are the world's subantarctic islands. The subantarctic islands circle the lower part of the globe, below New Zealand, Australia, Africa, and South America, between 47° and 60° latitude south of the Equator. They are filled with unique plants and wildlife, constantly battered by lashing rain and furious gales, and have a rich and fascinating human history. *Trial of Strength* tells the compelling stories of these islands and will leave you with an appreciation for the tenacity of humanity and the forbidding forces of nature.

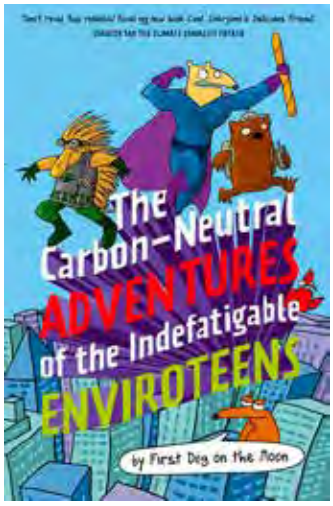
Publisher: Exisle Publishing | RRP: $39.99

Book Reviews

The Ring Ouzel: A View from the North York Moors - *Vic Fairbrother and Ken Hutchinson*

Although not an Australian migratory species, we can share in the excitement as the first ring ouzels (*Turdus torquatus*) of the year return from their winter quarters in North Africa. Using vivid extracts from field notebooks and illustrated with photographs, paintings, and sketches, the authors detail the ring ouzel's courtship displays, the establishment of territories, and the female ouzel's nest-building and egg-laying behaviour. The authors have recorded and analysed both simple and complex songs in their study area and have confirmed the suspected presence of local dialects. This milestone publication brings the ring ouzel into sharp focus for the first time.

Publisher: Whittles Publishing | RRP: $27.95



The Carbon-Neutral Adventures of the Indefatigable Enviroteens - *First Dog on the Moon*

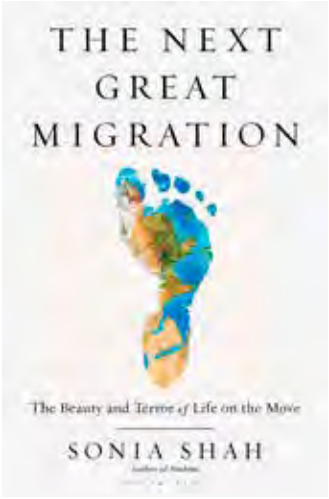
A hilarious graphic novel about a group of teens who are determined to save the planet. Together, they are the EnviroTeens and they are about to get very, very angry. Single-use Plastic Brendan may have an evil plan to destroy the world's turtles, but there is something even more sinister – climate change! The EnviroTeens will do anything to stop the impending disaster and save the world, but can they do it? Why not? Nobody else is! This book is a great way for parents to inspire conversations with their children about the complexities of contemporary environmental politics.

Publisher: Allen & Unwin | RRP: $16.99

A Life of Extremes - *Max Quinn*

Max Quinn's filmmaking career has taken him to the edges of the earth; from New Zealand to Alaska and Antarctica to the Arctic. *A Life of Extremes* is a personal memoir of Max's travel and polar filmmaking encounters with wildlife in these remote locations. Whether it be travelling eighty kilometres over ice to a lonely colony of emperor penguins (*Aptenodytes forsterior*) or being surrounded by minke whales (*Balaenoptera bonaerensis*) frolicking in pools of open water, Max has a story to tell about it. Learn about everything that nature has to offer in landscapes where the temperature is permanently below freezing.

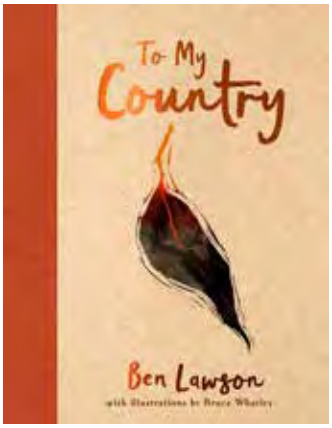
Publisher: Exisle Publishing | RRP: $49.99



The Next Great Migration - *Sonia Shah*

Wildlife are escaping warming seas and dry lands, creeping, swimming, and flying in a mass migration from their past habitats. News media presents the scrambling of the planet's migration patterns as unprecedented, provoking fears of the spread of disease, conflict, and waves of anxiety across the Western world. But the science and history of migration in animals, plants, and humans tell a different story. Far from being a disruptive behaviour, migration is an ancient and lifesaving response to environmental change. In other words, migration is not a crisis it is the solution. Conclusively tracking the history of misinformation from the 18th century through today's anti-immigration policies, *The Next Great Migration* makes the case for a future in which migration is not a source of fear, but hope.

Publisher: Bloomsbury | RRP: $29.99



To My Country *by Ben Lawson*

Ben Lawson was preparing for another Christmas away from home when the 2019-2020 black summer bushfires began to burn their way across the east coast of Australia. As the bushfires continued to rage into the new year, on an unprecedented scale, Ben, feeling angry and helpless, sat down, and put his feelings into words. *To My Country* is an ode to the endurance of the Australian spirit, the shared love of our country, and its precious wildlife and natural spaces. *To My Country* is a reminder of how desperately we need to think about our future and the importance of implementing action for a sustainable lifestyle.

Publisher: Allen & Unwin | RRP: $29.99

Be More Vegan - *Niki Webster*

Whether you are ready to commit to a fully plant-based lifestyle or you would just like to add a few meat-free dishes to your weekly meal plan, *Be More Vegan* is the ideal guide. It explains the reasons behind going vegan, including environmental, health, and animal welfare benefits. It answers all the nagging questions about nutrition and ethics, as well as providing information about the best vegan ingredients, substitutions, and food hacks. With over fifty mouth-watering recipes for every situation, there is so much to love about the vegan lifestyle, so be more vegan and start making a difference in the most delicious way possible!

Publisher: Allen & Unwin | RRP: $24.99

Australian Wildlife Society

(ACN 134 808 790)

Formed in 1909 and dedicated to the conservation of Australia's wildlife
Patron: His Excellency General the Honourable Sir David Hurley AC DSC (Retd)
Governor-General of the Commonwealth of Australia

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

112th ANNUAL GENERAL MEETING
AGENDA

Wednesday 3 March 2021
Commencing at 11.30am

in the Preston Stanley Room
New South Wales Parliament House,
6 Macquarie Street, Sydney NSW 2000

1. Welcome and recording of those present.
2. To receive apologies.
3. Minutes of the 111th Annual General Meeting held on Wednesday 4 March 2020.
4. President's Report for 2020.
5. Treasurer's Report for 2020. Receive and adopt the Balance Sheet and Income and Expenditure of the Society for the year ending 31 December 2020 in accordance with our Constitution.
6. Election for the Board of Directors of the Society:
   a) Patrick Medway retires in accordance with the Constitution (10.3) and being eligible, offers himself for re-election
   (b) Suzanne Medway retires and will not stand for re-election
   (c) Robin Crisman offers herself for re-election after filling a casual vacancy on the board (10.5(b))
7. Appoint the Auditor for 2021 – Peter J Varley CA
8. Closure.

Issued by authority of the Board of the Wildlife Preservation Society of Australia Limited Trading as Australian Wildlife Society.

Patrick W Medway AM
HONORARY SECRETARY/CHIEF EXECUTIVE OFFICER
15 January 2021

All members are cordially invited to attend the Annual President's Luncheon at the conclusion of the Annual General Meeting.

National Office: 29B/17 Macmahon Street, Hurstville NSW 2220

Telephone: 0424 287 297

Email: info@aws.org.au
Website: www.aws.org.au

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

The President and Directors of the Board of the

Australian Wildlife Society

cordially invite you to the

ANNUAL LUNCHEON

to celebrate 112 years of wildlife conservation

of the Society

Wednesday 3 March 2021
Commencing at 12 noon

in the Members' Dining Room
New South Wales Parliament House
6 Macquarie Street, Sydney NSW 2000

RSVP by 3 February 2021. Booking and prepayment essential

Acceptance form:

I am pleased to accept your kind invitation to the Annual Luncheon.

$.....for ..... Tickets at $70 per person
3 course - entrée, main, and dessert, including drinks

Name ..... Address.....

..... Email .....

Cheques can be mailed to:
Australian Wildlife Society
29B/17 Macmahon Street
Hurstville NSW 2220
Telephone 0424 287 297 with credit card details.

Direct debit:
Australian Wildlife Society
BSB: 062 235
Account No: 1069 6157
Confirm details via email at accounts@aws.org.au

Wildlife Ecology
Research Scholarship

The Australian Wildlife Society Wildlife Ecology Research Scholarship is open to postgraduate research students from three Australian Universities undertaking a research project that is of direct relevance to the conservation of Australia's native wildlife.

Scholarships are valued at $5,000 for one year.

HOW TO APPLY
aws.org.au/scholarships/

APPLICATIONS CLOSE
31 May each year

UNSW SYDNEY

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

WESTERN SYDNEY UNIVERSITY

WILDLIFE PRESERVATION SOCIETY OF AUSTRALIA LIMITED
TRADING AS AUSTRALIAN WILDLIFE SOCIETY

YOUR LEGACY FOR AUSTRALIA'S WILDLIFE

The Wild Life Preservation Society of Australia was founded in 1909 by a group of enthusiastic bushwalkers. Our founders suggested the need for such a group in a talk with the Naturalists' Society of NSW. The Swedish Consul-General for Australia, Count Birger Mörner, organised the first preliminary discussion in the Consulate on 11 May 1909. As an outcome of this discussion, it was decided to call a public meeting for the formation of the Society. Fifty people attended and were enrolled as the first members of the Society. Within one week, the newly formed Wild Life Preservation Society of Australia had grown to more than one hundred members.

The Provisional Committee worked hard and in the same year, the inaugural meeting adopted a constitution and elected the first chairman, the Hon. F E Winchcombe MLC, head of a large firm of woolbrokers, skin and hide merchants. There were six women on the first council of twenty-five people, and some who were later to become famous as naturalists.

Our Society pioneered the recognition of the need for legal protection for Australia's animals and plants.

Today we are known as the Australian Wildlife Society (AWS). We are a national not-for-profit conservation organisation. Our mission is to conserve Australia's wildlife (flora and fauna) through education and involvement of the community. We are dedicated to the conservation of Australian wildlife in all its forms through environmental education, political lobbying, advocacy, and hands-on conservation work. AWS is a registered company limited by guarantee with ASIC and is responsible for complying with all its regulations. AWS is funded through membership fees, sponsorships, partnerships, donations, and bequests. The Society is managed and controlled by an elected board of ten volunteer directors. We hold regular monthly meetings, on the first Wednesday of each month in Sydney, to discuss important wildlife conservation matters and make a number of significant decisions.

Furthermore, 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 Society has always known that a 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 wildlife and the conservation of its vital habitat in all their planning, policies and discussions.

YOUR BEQUEST WILL HELP US TO CONTINUE TO PRESERVE AUSTRALIA'S WILDLIFE FOR FUTURE GENERATIONS

HOW YOUR BEQUEST WILL BE USED

By remembering AWS with a bequest in your will, you are making a unique commitment. Your bequest to AWS will help us continue to preserve Australia's wildlife for future generations.

We rely on our supporters' generosity to enable us to continue working towards the conservation of Australian wildlife (flora and fauna) in all its forms through national environmental education and advocacy. Without you, our work would simply not be possible. Whatever the amount you bequeath to AWS, your contribution is invaluable.

A bequest is one of the most effective and long-lasting ways you can help AWS. Your promise of future support is deeply appreciated. If you have included a bequest to AWS in your will, please let us know. We thank you personally for this bequest of support. At all times your privacy will be fully respected and the information you provide will remain strictly confidential.

Your bequest will go directly to wildlife and/or wildlife conservation projects across Australia. Some examples of our projects are listed below:

- Supporting wildlife rescue groups that are rehabilitating injured wildlife
- Active involvement in national environmental education
- Lobbying and advocating for the protection of Australia's wildlife and its habitats
- Offering university grants and scholarships to honours or postgraduate students at Australian universities
- Offering conservation group grants
- Offering free membership to all students in Australia
- Founding Australian Wildlife Week
- Presentation of our four annual prestigious awards
- Founding the NSW Platypus and Turtle Alliance
- Kinder Program – the Society has selected a number of wildlife conservation programs in each state of Australia and one in New Zealand to receiving conservation funding under this new program
- Holding an annual threatened wildlife photographic competition that rewards and promotes the conservation of threatened or endangered Australian wildlife through the medium of photography

HOW TO MAKE A BEQUEST

If you already have a will but would like to leave a bequest to AWS, you can do so by making a simple addition to your existing will. This is called a codicil. If you do not have a will at the moment, you can simply include a bequest when you write a new will. Whatever your circumstances, we would advise you to see a solicitor to ensure that your wishes will be followed.

When catastrophic events occur and our immediate action is required, it is essential that all our programs continue without interruption. Financial flexibility is crucial to our ability to respond to priority needs, so we ask that you do not designate your gift to a particular project or region.

Types of bequests:

1. A **residuary bequest** is the most effective way to leave a bequest to AWS. It is a gift of what remains after you have made provisions for your loved ones. A residuary gift will keep up with inflation. It will mean your bequest will achieve as much in our projects in the future as you would like it to now.
2. Leaving a **percentage of your estate** allows you to decide what proportion of your total estate you would like to give to AWS. A percentage gift will also keep up with inflation.
3. A **pecuniary bequest** is a fixed sum of money to be left to AWS. This type of gift will not keep up with inflation.

Recommended bequest wording

Please take this information with you when you visit your solicitor to draft or update your will. We suggest the following wording:

"I give and bequeath

- the residue, or
- [.....] percentage of my whole estate, or
- [.....] percentage of the residue, or
- the specific sum of $[.....]

to the Wildlife Preservation Society of Australia Limited, for its general purposes, and declare that the receipt of the Treasurer for the time being of the Wildlife Preservation Society of Australia Limited shall be a complete discharge to my Executors in respect of any sum paid to the Wildlife Preservation Society of Australia Limited."

Your solicitor may also require the following detail:

ABN: 13 817 470 816

FREQUENTLY ASKED QUESTIONS

What is a bequest?

A bequest is a gift left in your will. It's also known as a legacy. You can leave a bequest by writing a new will, or by adding a codicil (an addition) to your existing will. We recommend you consult a solicitor who can help you write your will.

What is the best way to leave a bequest in my will to AWS?

The best way to leave a bequest to AWS is to leave a monetary bequest (i.e. not property, shares, etc.) and a residuary bequest. This is a gift of what remains after all your other provisions have been made, enabling you to put your loved ones first. A residuary bequest also keeps up with inflation, this is the most effective way to provide a gift to AWS. You can also leave a percentage of your estate or pecuniary bequest, which is a fixed sum of money to be left to AWS.

I want to leave a bequest to a specific project. Can I do this?

Having flexible funds is essential to our ability to respond rapidly and where the need is greatest. Leaving a bequest for the Society's general use is the most effective as it means that your gift will definitely be used where it is needed most. Leaving a bequest to a specific type of work or location might mean that it cannot be used. This can occur if we are no longer working there or doing the kind of work specified in the future. As such, we ask that you do not designate your gift to a particular project or region.

Can AWS help me write my will?

No, we don't have that kind of legal expertise. We recommend you consult a solicitor who can help you write your will. There is also a public trustee in every state of Australia that offers will-writing services.

Can I make AWS the Executor of my will?

No, we appreciate your trust in the Society but we do not have the necessary resources. We try to keep administration costs low so that the maximum amount can go towards our projects in the field. As such, we choose not to take the role of Executor of a will as this can often be a lengthy and involved legal process.

Can I leave you my house, other property or shares?

Yes, but monetary gifts are preferred as AWS would need to convert any property or shares into cash to be able to use them. This means additional time and resources spent trying to get the best price and sell these items before we can put your bequest to use.

PTO>

L to R: Wayne Greenwood, Brian Scarsbrick, Alice Suwono, Suzanne Medway, Patrick Medway, Trevor Evans, Philip Sansom, Megan Fabian and Ken Mason.

My relative has passed away and left a bequest in their will for AWS. What do I need to do?

We very much appreciate bequests left to us from generous supporters. Please ask the Executor to notify us in writing of the bequest by sending a letter to the National Office Manager, 29B/17 Macmahon Street, Hurstville NSW 2220 or via email manager@aws.org.au and we can start the process of transferring the bequest to AWS.

Why is having a will so important?

If you do not have a will when you die, state laws will determine how your assets will be distributed. Leaving clear instructions and sharing your decisions with your family and friends can give you the peace of mind that your final wishes will be understood and respected after you are gone. We recognise that writing a will is one of the most significant decisions you'll ever make. That's why we know it's important to take your time and have all of the information you need to help you make up your mind.

Wildlife Preservation Society of Australia Limited
Trading as Australian Wildlife Society

Address: 29B/17 Macmahon Street,
Hurstville NSW 2220, Australia
Tel: (61) (4) 24 287 297
Email: manager@aws.org.au
ABN: 13 817 470 816
Web: aws.org.au/bequest

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

REGISTERED CHARITY
acnc.gov.au/charityregister

Be a part of the Australian Wildlife Society's conservation future






To commit to being a part of our future, please complete this form. You may cancel your donation subscription at any time by notifying the national office.

Australian Wildlife Society
29B/17 Macmahon St
HURSTVILLE NSW 2220

Email: accounts@aws.org.au
Telephone enquiries to: 0424 287 297

You may also commit by visiting www.aws.org.au and registering online

All donations of $2 or more are tax deductible.

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

Your Details

Name: Dr / Mr / Ms / Mrs / Miss

Address:

State: Postcode:

Phone: Home Work

Email:

☐ I want to join the Friends of AWS and give by automatic deduction each month to help protect our unique native wildlife and its important habitat

I will give via: Credit Card (please complete authority form below)

Credit Card Payments

I am paying by: ☐ Visa ☐ MasterCard Card Security Code (CSC) __ __ __ __

Card No. __/__/__/__/ __/__/__/__/ __/__/__/__/ __/__/__/__/ Expiry date ___ /___

Name on card Signature

Regular Payment can be made by EFT

BSB: 062 235
Account No: 1069 6157
Account Name:
Australian Wildlife Society

I will give:

☐ $10 per month ☐ $15 per month ☐ $25 per month ☐ $50 per month

☐ My choice of $ per month _____

Signature Date

This authorisation is to remain in force until cancelled by the donor and in accordance with the terms described in the Agreement below.

Deduction will be made on 15th of each month.

CREDIT CARD AUTHORITY

1. The Donor will be advised 14 days in advance of any changes to the Credit Card Authority arrangements. 2. For all arrangements relating to the Credit Card Authority arrangements, the Donor will need to write to 29B/17 Macmahon St, HURSTVILLE NSW 2220 or email info@aws.org.au. 3. Account details should be checked against a recent statement from your Financial Institution. 4. It is the donor's responsibility to ensure sufficient funds are available when the payments are due to be drawn. 5. If the due date for payment falls on a non-working day or public holiday, the payment will be processed on the next working day. 6. For returned unpaid transactions, the following procedure will apply: AWS will advise the Donor of the unpaid transaction and request alternative arrangements to be made for payment if possible. 7. All Donor records and account details will be kept private and confidential to be disclosed only at the request of the donor or Financial Institution in connection with a claim made to an alleged incorrect or wrongful debit. 8. This authorisation is to remain in force until cancelled by the Donor.

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)

- ☐ Student: $0 (Conditions apply)
- ☐ 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 $ .....

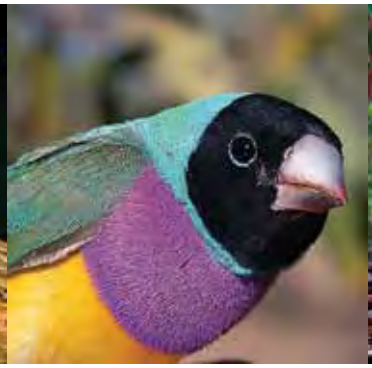
Total $ .....

Mail to the: **Australian Wildlife Society**
29B/17 Macmahon St, HURSTVILLE NSW 2220
Email: accounts@aws.org.au
Website: www.aws.org.au

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

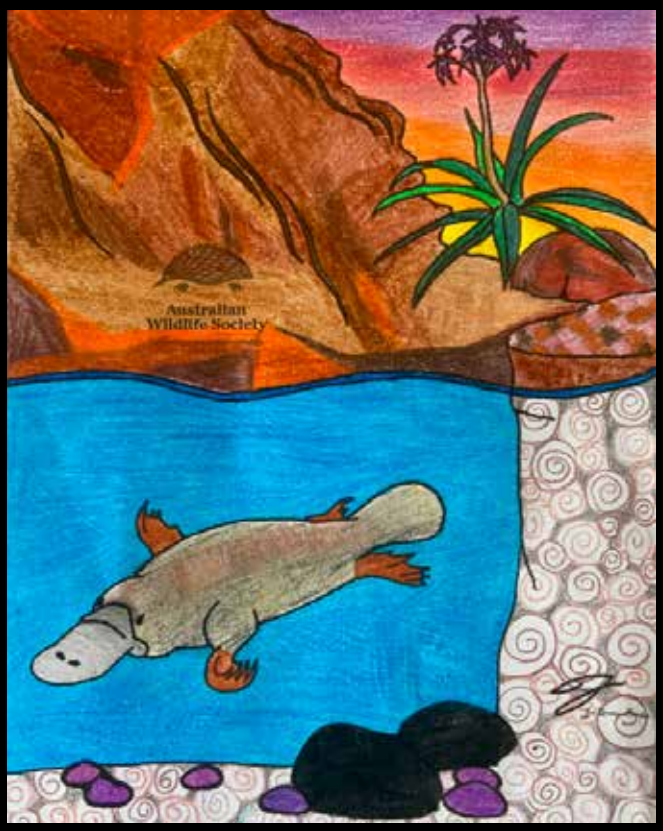
Membership Hotline: Mob: 0424 287 297

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

2020 Colouring-in Competition

Five-year-old Sam from the Northern Territory



Six-year-old Fionn from New South Wales

Eleven-year-old Jaynie from South Australia