AUSTRALIAN Wildlife

WINTER Volume 3/2024
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Journal of the Wildlife Preservation Society of Australia

Celebrating a new century of wildlife preservation in Australia

(Founded 1909)

Threatened Wildlife Photographic Competition

Ghost bat (*Macroderma gigas*).
Image: Bruce Thomson – 2020 entrant.

Green sea turtle (*Chelonia mydas*).
Image: Juliet Healey – 2021 entrant.

Fairy tern chick (*Sternula nereis*).
Image: Julie Knight – 2022 entrant.

Palm cockatoo (*Probosciger aterrimus*).
Image: Christina Zdenek – 2023 entrant.

Australian Wildlife Society
Conserving Australia's Wildlife since 1909 ®

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Contents

Features

Regulars

Megan Fabian
Editor, *Australian Wildlife*

On the Cover

Front Cover
Skylos Ecology conservation detector dog 'Rex' in training to find microbats that have been killed because of wind turbines in Central Victoria, Victoria, Australia. Image: Doug Gimesy.

Back Cover
The wedge-tailed eagle (*Aquila audax*) is Australia's largest bird of prey. It is widely known that wind turbines and birds do not mix, and the impact of turbines on raptor species is particularly concerning. Image: Geoffrey Moore.

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.

Print Post Approval No: PP 100024559

ISSN 0155-266X

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Member Notice

The Australian Wildlife Society (Wildlife Preservation Society of Australia Limited) is managed and controlled by an elected Board of up to ten volunteer Directors. The Society is endorsed as a deductible gift recipient under Subdivision 30-BA and registered with the Australian Taxation Office. Its gift fund is also administered under the Australian Taxation Office.

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, excluding January.

Members are invited to consider submitting a short article with photographs for possible publication.

Our Mission

The Australian Wildlife Society (Wildlife Preservation Society of Australia Limited) is a national not-for-profit wildlife 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, advocacy, public awareness, community involvement, 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 attempted to convince politicians of the necessity to include the preservation of Australia's precious wildlife and its vital habitat in all their planning, environmental issues, and discussions.

From the President's Desk

Stephen Grabowski – President

"We are delighted to have secured a new National Office and Environmental Education Centre in the busy Campbelltown region of south-west Sydney, New South Wales. We are proud to be moving into a Local Government Area that supports one of Australia's iconic species – the koala."

Welcome to the Winter 2024 Edition of *Australian Wildlife*

We are delighted to have secured a new National Office and Environmental Education Centre in the busy Campbelltown region of south-west Sydney, New South Wales. We are proud to be moving into a Local Government Area that supports one of Australia's iconic species – the koala. The official opening of the new National Office and Environmental Education Centre will take place on Tuesday, 20 August 2024, at 11 am.

The federal government is now approving several offshore wind farm projects around Australia. Apart from destroying the beautiful coastal horizon, is it worth all the effort? We have sourced some interesting articles, including an article from Emma Bennett, from Monash University, titled 'Setting the Intention for a Nature-Positive Wind Industry', featured on pages 10 to 14.

Much discussion has occurred about the worthiness of a wind farm. Most recently, along the New South Wales Illawarra coast, the government said this offshore wind farm zone would be 1,022 square kilometres, two-thirds of its original proposed size, to protect little penguins, rocky reefs, and the southern right whale.

We understand the need to move away from fossil fuels, but what price will we pay to achieve this? Protecting our natural environment is also an essential part of our mission.

There are so many mixed emotions about the validity of the information we get on how these ocean wind farms will impact the environment. If we examine existing land wind farms overseas, we sadly find that they kill hundreds of eagles, similar to Australia – in Tasmania and on the mainland. However, regarding an ocean wind farm in Australian waters, could it be the albatrosses that the wind farm blades start killing? Why would a bird fly into one instead of flying around it? Science is yet to understand why.

The economic benefit of wind farms to the country is enormous. However, many unanswered questions impact what these wind turbines will do to wildlife, including marine life. Are the economic benefits worth the destruction and potential extinction of native species?

A lot more research is being completed, and scientists are making progress.

Stephen Grabowski at the entrance of the Society's new National Office and Education Centre.

A koala (*Phascolarctos cinereus*). Image: Candice Bartlett.

Australian Wildlife Society

NATIONAL COLOURING-IN COMPETITION

The Australian Wildlife Society colouring-in competition is designed to inspire the younger generation to learn about Australia's native wildlife via visual art and creativity. We hope that the experience provides participants with the opportunity to explore and develop a deeper understanding of environmental and wildlife-related issues.

There will be one first, second and third place winner in each state and territory of Australia. The first place finalist in each state and territory will go into a draw to have their artwork published in the Society's magazine *Australian Wildlife*. All first place winners will receive an annual family membership, valued at $70, and a certificate of congratulations. Their artwork will be published in the Society's e-newsletter and social media platforms. Second and third place winners will receive a certificate of congratulations and their artwork will be published in the e-newsletter and social media platforms.

TERMS AND CONDITIONS

When you submit your entry, please include the following information:

- Your name and age
- Your state of residence
- Telephone number and/or email address (this is how we will notify the winners)
- Parent/guardian signature as consent for entry into the competition

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- To submit your entry, please take a photo or scan the completed artwork and email a copy to info@aws.org.au
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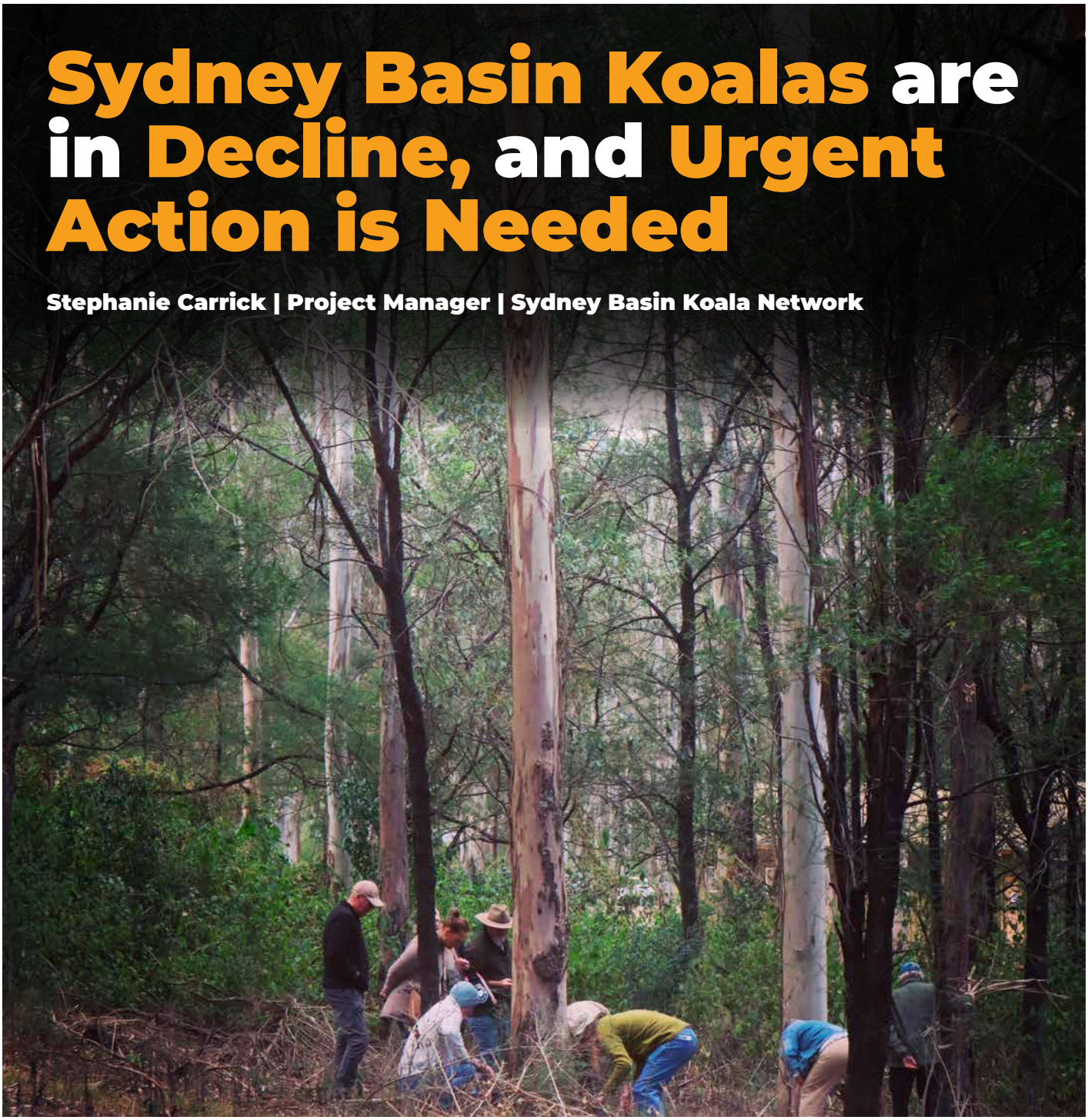
Sydney Basin Koalas are in Decline, and Urgent Action is Needed

Stephanie Carrick | Project Manager | Sydney Basin Koala Network



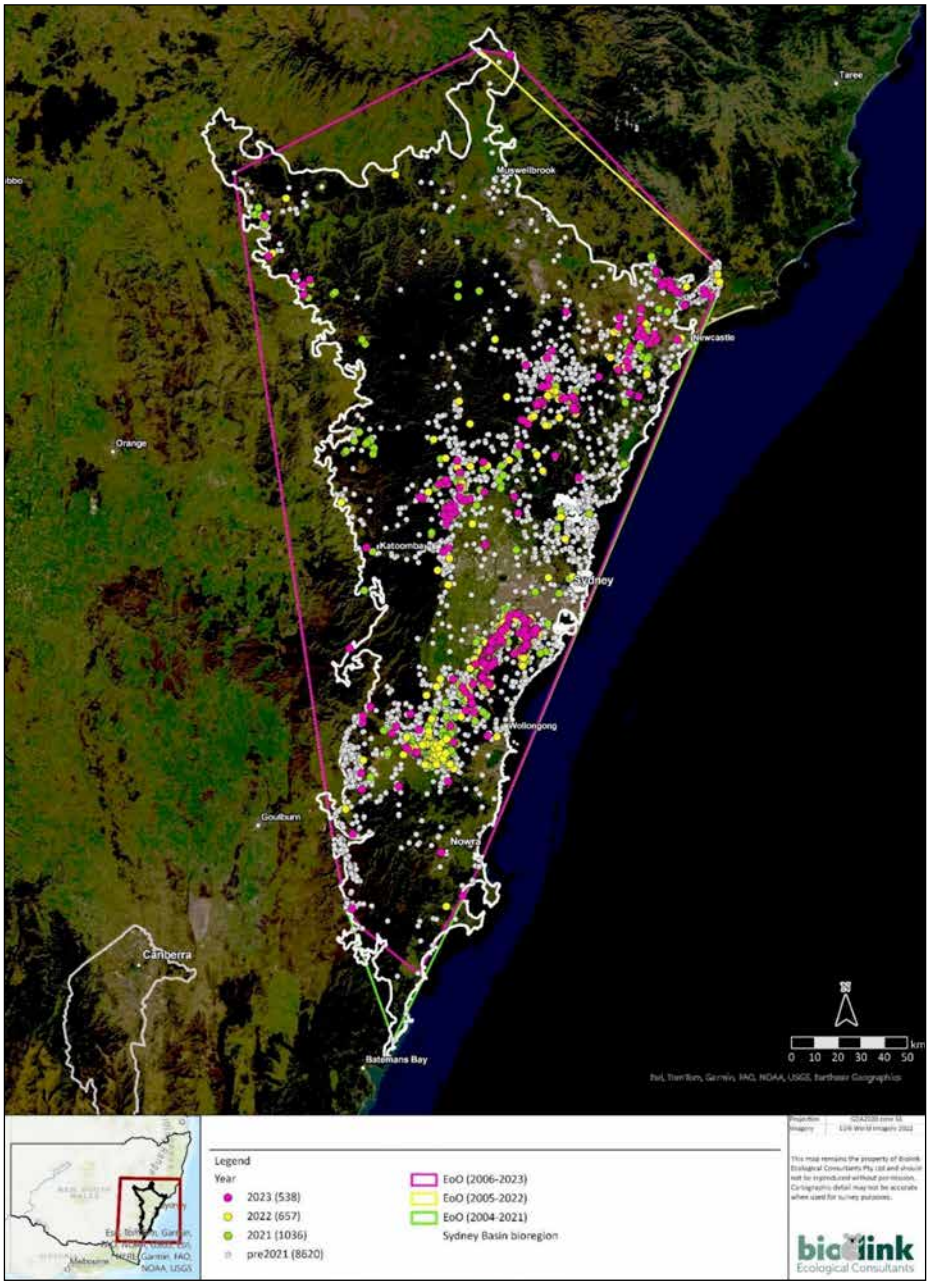
The Sydney Basin Bioregion is home to a number of koala (*Phascolarctos cinereus*) populations, including outer-metropolitan areas of Sydney in the Sutherland Shire and Campbelltown regions and then spreading outwards forming a green belt of peri-urban areas from Wollondilly and Illawarra, inland to the Southern Highlands, then up to the Blue Mountains and across to the Hawkesbury and the Mid-Hunter region. These koalas face a myriad of threats from development, with urban sprawl being chief among them. The housing crisis is creating a koala crisis, and our new research indicates that koalas in the Sydney Basin continue to decline since being listed as endangered in New South Wales.

The Sydney Basin Koala Network is a project of the Total Environment Centre and WIRES that supports over twenty local environmental groups via advocacy, ecological data, legal advice, and citizen science training. Our most recent research, undertaken by Biolink ecologists, analysed the extent of occurrence, area of occupancy, and areas of generational persistence of koalas in the Sydney Basin Bioregion from 2021 to 2023.

What they found was alarming. The area where koalas are found in the Sydney Basin is declining, and the areas supporting long-standing breeding populations of koalas are also reducing, with all measures showing a trend of decline in the Sydney Basin despite The NSW Koala Strategy's attempts to double species numbers. Significant populations in Cessnock and the Southern Highlands are of particular concern, with generational persistence in Cessnock halving and the area occupied by koalas decreasing significantly in both Local Government Areas between 2021-2023. The only relatively stable koala populations are the most threatened by impending urban sprawl outwards from Sydney.

Top: Sydney Basin Koala Network Citizen Science Training, Hawkesbury, New South Wales. Image: Stephanie Carrick.

Koala (*Phascolarctos cinereus*) scats found in Campbelltown, New South Wales. Image: Jade Peace.



The occurrence of koalas (*Phascolarctos cinereus*) in the Sydney Basin Bioregion, New South Wales. Image: Biolink Ecological Consultants.

Overall, the proportional area where koalas are found in the Sydney Basin has slightly declined, and there are fewer areas supporting long-standing breeding populations:

1. The geographic extent (extent of occurrence) of koalas across the Sydney Basin has remained relatively stable from 2021 to 2023, with a slight overall trend towards a decline (0.75 percent). This decline represents a decrease of 35,857 hectares,
2. The proportion of this extent which is occupied by koalas (area of occupancy) across the Sydney Basin shows a small but significant decline from 12.81 percent ± 0.18 percent (2021) to 12.55 percent ± 0.13 percent (2023),
3. Areas of generational persistence (long-standing source populations) across the Sydney Basin are dynamic, though there is an overall decrease in the number of cells of generational persistence between the time frames 2021 (population sample of 141) and 2023 (population sample of 125), and
4. When considering the six focal areas, patterns are variable, with some areas showing small increases or relative stability, e.g. Hawkesbury and Liverpool Local Government Areas, respectively. In contrast, others show significant declines, e.g., Cessnock and Wingecarribee Local Government Areas.

Disparities in koala protection in New South Wales remain, with progress to a single State Environmental Planning Policy that provides a definition of koala habitat stalled, and twenty-one of twenty-three relevant councils in the Sydney Basin remain without a Comprehensive Koala Plan of Management in place. A Comprehensive Koala Plan of Management allows for

Stephanie Carrick has a long track record of managing high-profile projects and programs for ABC, Triple J, and SBS. After studying a Master of Climate Change and volunteering as a wildlife rescuer and carer at WIRES, Stephanie now dedicates her time and energy to protecting wildlife and their precious habitats.

landscape-level planning of koala habitat to prevent koala corridor fragmentation. It also implements mitigation measures for key threats like cars, swimming pools, and dogs.

Despite a year in office, the new Labor government has not detailed its plans for environmental reform, including its commitments around land clearing and biodiversity offsets, and is still preparing its response to the five-year statutory reviews of the *Biodiversity Conservation Act 2016* and Part 5A of the *Local Land Services Act 2013* that is largely responsible for the runaway clearing of koala habitat in rural areas. The Federal government continues to work on legislative reform to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Yet, progress is slow, and, at this stage, it is still unclear how the reforms will ensure improvements in threatened species conservation, including koalas.

Key steps available to the state government to immediately halt this decline include:

1. Finalising the Koala State Environmental Planning Policy Guideline – applying a complete list of koala habitat trees to rural and urban land,
2. Adding all Local Government Areas in the Sydney Basin with koala sightings to the Koala State Environmental Planning Policy,
3. Giving recognised koala corridors legal protection by following Chief Scientist recommendations to protect, restore, and zone appropriately sized corridors as conservation land, and
4. Scrapping both code-based clearing and the Rural Boundary Clearing Code in the Sydney Basin Bioregion to prevent further fragmentation of koala habitat.

We are calling for the New South Wales and Federal governments to put their foot on the accelerator for koala protection. The threats are multiplying while adequate protections languish. New laws must be enacted, conservation reserves and migratory corridors must be protected, and the state's Koala Strategy must be made effective by including legislative reform.

Koalas are only found on the east coast of Australia. They can only survive in the forest types they were raised in, which in the Sydney Basin include the critically endangered Cumberland Plain Woodland and the critically endangered Shale Sandstone Transition Forest. The need for real environmental law reform that prevents koala habitat loss is becoming increasingly urgent.

Koalas (*Phascolarctos cinereus*) in Barden Creek, Sutherland Shire, New South Wales. Image: Mel Clarke.

A koala (*Phascolarctos cinereus*) was spotted on a site planned for development in Appin, New South Wales. Image: Jade Peace.

Setting the Intention
for a Nature-Positive Wind Industry

Wind energy is part of our transition to alleviate the threat of climate change. However, Australia's pledge to a nature-positive future is under threat unless operational changes are made to our existing and future wind energy projects. Tagged the 'green-green dilemma', wind energy poses significant risks to some species of birds and bats, and Australia is falling behind global good practices in response to this threat to our biodiversity.

Wind energy in Australia has grown by over fifteen percent per year in the past decade, and this figure will continue to rise. While we must transition away from our reliance on fossil fuels, it is equally essential to transition to renewable energy and a sustainable system that does not place biodiversity at risk. Without operational changes to wind development in Australia, even some of our common species could be pushed towards extinction.

Insectivorous bats, raptors, flying foxes, and some migrating species of birds are colliding with turbines, sometimes in alarming numbers. For species like our small bats, global estimates of fatalities exceed well over 1 million bats killed at wind turbines yearly. In Victoria, the figure is currently estimated to be between 25,000 and 50,000 insectivorous bats yearly, with higher fatality rates predicted for the more biodiverse regions of northern Australia. For raptors, impacts can vary between different wind facilities, with species like wedge-tailed eagles (*Aquila audax*), brown falcons (*Falco berigora*), and nankeen kestrels (*Falco cenchroides*) being particularly susceptible to collision. More recently, however, flying fox carcasses have been collected under wind turbines, and as wind energy continues to develop across their range, we will see an increase in the risk of collisions. But it is not only common species that are impacted; the critically endangered southern bent wing bat (*Miniopterus orianae bassanii*) has also been found at numerous wind facilities within its range.

The United Nations states that biodiversity is our strongest natural defence against climate change. Yet, in the past fifty years, we have seen almost seventy percent reduction in species population sizes. Ensuring that our actions to address climate

change do not threaten biodiversity is imperative. Since 1980, threatened terrestrial bird populations have declined in Australia by sixty-two percent, threatened shorebirds by forty-two percent, and threatened marine birds by thirty-three percent. For all but a few species of microbats, however, population data is not available, which means that we do not know if populations are declining, increasing, or stable. Whilst most of our small bats are data deficient, we know they are long-lived and slow to reproduce, making recovery from any population decline difficult. Research in the northern hemisphere has raised serious concerns about wind turbine mortality for bats, predicting that without operational changes, even common species may be pushed to extinction.

To quantify the impact a wind farm has on birds and bats, wind and wildlife experts have been collecting carcasses under wind turbines for over twenty years and have refined the science of estimating fatality rates. Post-construction fatality monitoring is typically undertaken in most states of Australia as part of the wind facilities permit. It requires surveying areas under turbines for bird and bat carcasses. Not all post-construction fatality monitoring programs are equal, and the delivery of such programs is left to private consultants who vary widely in their quality and standards. Fatality monitoring must consider bias factors that influence the number of carcasses found, such as removal by scavenging animals, carcasses that fall outside of the survey area and how good the survey method is at finding a carcass if it is there. Survey methods that engage dogs to find small bird and bat carcasses typically have higher detection rates than human-based observers. However, even well-trained dogs will not find everything, especially if they are not given enough time to search or are not handled well. Ensuring consistent standards around post-construction fatality monitoring programs is critical to allow results from one site to be compared to another.

Top left: Early morning fog at Waubra Wind Farm in Victoria. Image: Emma Bennett.

Top right: Turbine collisions, the number one threat facing our small microbats, could drive certain bat species to extinction, like the critically endangered southern bent-wing bat (*Miniopterus orianae bassanii*). Image: Bruce Thomson (one of the Society's 2020 photography competition entrants).

Australia's first bird and bat detection dog 'Elmo', pictured at Waubra Wind Farm, began work in 2005 and retired in 2012. Image: Emma Bennett.

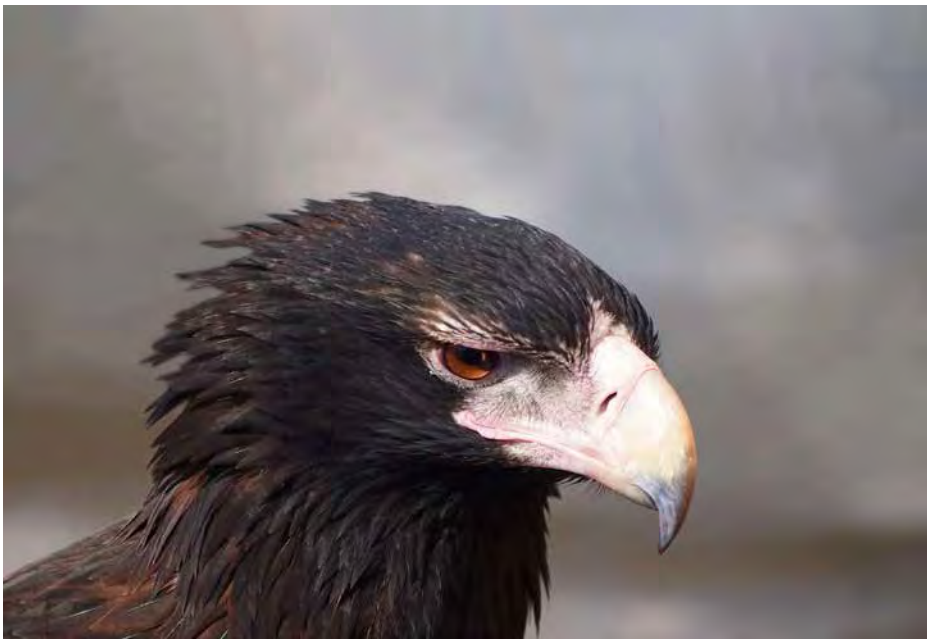
But it is not all bad news. While wind energy kills bats, it does not have to. For microbats, the solution is simple. Operational curtailment of turbines during periods of high bat activity has been shown to reduce collisions by as much as ninety percent with only minor losses of energy generation. Curtailment of new turbines is mandatory in some parts of Europe, Canada, and the United States, and it has been placed as a condition of development by major financial lenders for projects in developing nations. In Australia, we have one operating wind facility with a partial curtailment strategy implemented to reduce impacts on the critically endangered southern bent wing bat. Curtailing turbines involves changing the speed at which turbines commence spinning. Typically, blades begin to spin when wind speed reaches 3 meters per second, and turbines reach maximum energy generation at around 10 meters per second. Bats are more at risk during lower wind speeds, and raising the cut-in speed to 8 meters per second overnight during late summer and early autumn will prevent almost all bat deaths in south-east Australia. Global good practice is to curtail turbines during periods of high

The sunrise over Waubra Wind Farm in Victoria. Image: Emma Bennett.

collision risk for the life of the wind farm, and we need to work towards this solution in Australia.

The solutions are a little more complex for birds and flying foxes, but there are tools and mitigation options that can decrease the collision impact significantly. Technology incorporating image recognition software has been installed at a wind facility in Tasmania to prevent collisions with the Tasmanian wedge-tailed eagle (*Aquila audax fleayi*). Artificial intelligence technology identifies, tracks, and predicts the flight paths of eagles through wind facilities and shuts down turbines when a collision risk is identified. Such technology is widely used throughout the northern hemisphere to protect large birds from collisions and has provided an essential tool to maximise energy generation whilst minimising biodiversity losses. Similarly, nighttime radar technology can monitor and track bird movements and provides an opportunity for real-time shutdowns for night-migrating birds and flying foxes.

The Victorian government is working on a collaborative strategy for no net impact to wildlife from wind energy development, receiving substantial funding in early 2024 to provide Australia's first coordinated approach to solving wind and wildlife impacts. Whilst the northern hemisphere has funded research in this field for the past two decades, Australia is just at the beginning of its research journey. With wind power set to explode across Australia, time could not be more critical to fund research



A wedge-tailed eagle (*Aquila audax*). Image: Rae Wallis.

It is widely known that wind turbines and birds do not mix, and the impact of turbines on raptor species is particularly concerning. A Tasmanian wedge-tailed eagle (*Aquila audax fleayi*). Image: Jack Taylor (one of the Society's 2020 photography competition entrants).

Emma Bennett, principal ecologist at Elmoby Ecology and PhD Candidate at Monash University, holding a dried forest bat (*Vespadelus spp*). Image: Emma Bennett.

Smola Wind Farm in Norway at the first International Conference on Wind Energy and Wildlife Impacts in 2011. Image: Emma Bennett.

Skylos Ecology conservation detector dog 'Rex' in training to find microbats that have been killed via wind turbines in Central Victoria, Victoria, Australia. Image: Doug Gimesy.

in this space. Wind facility operators are not new to these lessons, as most have wind energy assets elsewhere in the world. Still, with evidence and exemplary leadership in Australia, we can transition from the green-green dilemma to a truly sustainable industry. The industry needs strong leadership and clear guidelines from our governments to ensure that the rapid development of wind energy is not at the expense of our native wildlife.

Regardless of the interventions adopted by the wind industry, some mortality of birds and bats will continue. However, if we work together and set the intention for a nature-positive industry, we can aim for a minimal impact and sustainable industry through operational controls such as curtailment and installing technological solutions. Sustainable not just because the wind will continue to blow but because our wildlife will continue to thrive.

Wind and wildlife experts worldwide at the Smola Wind Farm in Norway. Image: Emma Bennett.

Balancing Renewable Energy and **Marine Conservation:**

Understanding the Environmental Impacts of Offshore Wind Farming

Stephen Grabowski

In the urgent quest for sustainable energy sources, offshore wind farming has emerged as a promising solution to reduce carbon emissions and combat climate change. However, as we embrace this renewable energy revolution, it is crucial to examine the potential environmental impacts on our marine ecosystems, which are vital to the health of our planet.

Environmental Impacts on Marine Ecosystems

Offshore wind farms, while offering significant environmental benefits, pose several challenges to marine biodiversity:

1. **Habitat Disturbance –** Installing and maintaining offshore wind turbines involves substantial construction activities, including pile driving and cable laying. These processes can disrupt marine habitats, affecting fish populations, marine mammals, and seabird nesting sites,
2. **Noise Pollution –** During construction, noise pollution from activities like pile driving can disturb marine mammals and fish, which rely on sound for communication and navigation. Operational noise from turbines can also have long-term effects on marine life behaviour and migration patterns,
3. **Visual Impact –** Offshore wind farms alter the visual landscape of coastal areas, potentially impacting scenic views, tourism, and the cultural significance of local communities. Managing aesthetic concerns is crucial for balancing development with environmental conservation,
4. **Collision Risks –** Birds and bats are at risk of colliding with turbine blades, particularly during migration. Marine mammals, such as whales and dolphins, may also face collision risks during the installation and operation phases of offshore wind farms, and
5. **Cable and Infrastructure Impacts –** The installation of undersea cables and other infrastructure associated with offshore wind farms can disturb seabed ecosystems, affecting sediment composition and habitat integrity for marine organisms.

Mitigation and Conservation Efforts

Efforts are underway to mitigate these environmental impacts:

1. **Technological Innovations –** Advancements in turbine design and construction techniques aim to minimise environmental disturbances. Quieter turbine operations and improved siting strategies help reduce noise pollution and habitat disturbance,
2. **Monitoring and Research –** Ongoing monitoring programs and research initiatives play a crucial role in understanding the long-term effects of offshore wind farms on marine ecosystems. Collaboration between industry, government agencies, and conservation organisations is essential for effective mitigation strategies, and
3. **Policy and Regulation –** Robust environmental impact assessments and regulatory frameworks ensure that offshore wind projects meet stringent environmental standards. These frameworks promote sustainable development practices and protect marine biodiversity.

Conclusion

Offshore wind farming represents a significant step towards achieving renewable energy targets and combating climate change. However, considering its impact on marine ecosystems, its development must be approached carefully. By fostering innovation, promoting research, and implementing stringent regulations, we can harness the benefits of offshore wind energy while safeguarding our precious marine biodiversity.

Continued dialogue and collaboration are vital as we navigate the complex intersection of renewable energy and marine conservation. Together, we can strike a balance that ensures a sustainable future for both energy generation and marine life conservation.

Top: A humpback whale (*Megaptera novaeangliae*) off Morton Island, Queensland. Image: Chris Walker (one of the Society's 2021 photography competition entrants).

Top right: An offshore wind farm. Image: Norbert Pietsch.

‘Bat-Tastic’ Support

Gets Wildlife in Care the ‘Suite Life’

Cornelia Adolfsson | Melaleuca Wildlife Shelter

Melaleuca Wildlife Shelter is delighted to share the exciting news of their enclosure upgrades, all made possible through the generous support of the Australian Wildlife Society. This support was a game-changer, allowing us to enhance the living conditions of the native wildlife under our care. With this funding, we have created more spacious, naturalistic environments that better cater to the needs of animal residents as they undergo rehabilitation and recovery. Every species will benefit from these upgraded enclosures, from the endangered grey-headed flying fox (*Pteropus poliocephalus*) to tiny little forest microbats (*Vespadelus vulturnus*). Furthermore, this support will improve the lives of individual animals and contribute to broader conservation efforts, ensuring a brighter future for wildlife populations.

Since noticing the ever-increasing number of bat cases requiring care, we focused on enhancing our bat enclosures. The upgrades included the installation of bat-safe netting and specialised ropes to create a safer and more stimulating environment for the bats in care. It also included more advanced equipment to support the bats’ rehabilitation needs to ensure juvenile bats were raised in an enclosure that caused limited harm and maximum enrichment. These improvements also aim to promote better physical and mental health for the bats as they recover and prepare for eventual release into the wild.

Melaleuca Wildlife Shelter is dedicated to rescuing, rehabilitating, and releasing native Australian wildlife. Operating fully as a volunteer-run shelter, we provide a sanctuary for injured, orphaned, and sick animals, offering specialised care tailored to the unique needs of each species. These species include but are not limited to grey-headed flying foxes, ringtail possums (*Pseudocheirus peregrinus*), brushtail possums (*Trichosurus vulpecula*), various microbat species, and all native birds, including birds of prey. The Founder, Cornelia Adolfsson, and her volunteer team work tirelessly to ensure each animal receives the necessary medical treatment, nourishment, and enrichment to recover and thrive. Beyond direct animal care, we also engage in community education, vet clinic training, and advocacy efforts to promote conservation and coexistence with Australia’s diverse wildlife.

Flying fox pups at Melaleuca Wildlife Shelter typically stay in care for several months before they are ready for release. Upon arrival, these vulnerable pups receive intensive care, including regular feedings and monitoring, to ensure they grow strong and healthy. As they develop, the pups gradually transition to larger enclosures where they can practise flying and socialising with other bats. This period of care is crucial, as it allows the pups to develop their survival skills in a safe environment. Once they demonstrate the ability to forage independently and exhibit natural behaviours, they are moved into a creche and then slowly released back into their natural habitats, contributing to the conservation of their species.

In 2023, Melaleuca Wildlife Shelter experienced a significant influx of bat cases, including the endangered grey-headed flying fox and the little forest microbat (*Vespadelus vulturnus*). Initially, temporary enclosures were set

Top left: Two juvenile grey-headed flying foxes (*Pteropus poliocephalus*) cuddling in their wraps. Image: Cornelia Adolfsson.

Top right: A grey-headed flying fox (*Pteropus poliocephalus*) with a teat. Image: Cornelia Adolfsson.

Bottom right: A grey-headed flying fox (*Pteropus poliocephalus*) recovering from an entanglement in their new enclosure. Image: Cornelia Adolfsson.

up to accommodate these arrivals. However, thanks to the generous support from the Australian Wildlife Society, the shelter can now provide state-of-the-art enclosures specifically designed for these specialised species. This upgrade is crucial given these keystone species' essential role in Australia's ecosystems, contributing to pollination, seed dispersal, and overall environmental health. Protecting Australian bats and other native wildlife is vital for a healthy functioning ecosystem.

Caring for bats demands a unique skill set and dedication from volunteers. These caregivers must deeply understand bat behaviour, physiology, and dietary needs and take an entire vaccination course for Australian bat lyssavirus. They undergo specialised training to handle these delicate creatures with care and precision, as bats are highly susceptible to stress and injury. The shelter must be vigilant in monitoring for any signs of illness or injury, promptly seeking veterinary assistance when necessary. Patience, empathy, and a genuine passion for bat conservation are essential qualities for those committed to the well-being of these remarkable flying mammals.

At Melaleuca Wildlife Shelter, seasoned caregivers possess a wealth of knowledge gained through years of hands-on experience, enabling them to navigate the intricate needs of the diverse wildlife species they encounter. Each species presents unique challenges, from the specialised dietary requirements of grey-headed flying foxes to the intricate rehabilitation processes for injured microbats that need carefully controlled environments, frequent feeding regimens, and safe spaces to develop their flying skills. At the same time, possum joeys require warmth and constant monitoring. The shelter's dedicated volunteers and staff invest countless hours ensuring these juveniles receive proper nutrition, medical care, and enrichment. Collaborating closely with experienced veterinary teams, these caregivers bridge the gap between clinical expertise and the nuanced demands of wildlife rehabilitation. This synergy ensures that every resident receives tailored care and treatment, maximising their chances of successful rehabilitation and eventual return to the wild.

The need for wildlife shelters is certainly not slowing down any time soon. Melaleuca Wildlife Shelter is dedicated to contributing sustainably to wildlife conservation efforts. You, too, can support Melaleuca Wildlife Shelter's ongoing efforts in several meaningful ways. Financial donations are always welcome and can be made directly through our website at www.melaleucawildlife.com, which will help fund vital upgrades, medical supplies, and daily animal care. Additionally, volunteers are crucial to our operations, offering hands-on assistance with animal care, facility maintenance, and educational outreach. Donations of food, cleaning, and animal care items are also greatly appreciated. We have a 'Wishlist' on our website and Instagram page (@melaleucawildlife). Every bit of support helps to ensure these animals receive the best possible care and a chance to thrive in the wild.

Scan to donate

Two juvenile brushtail possums (*Trichosurus vulpecula*) cuddling up in their enclosure. Image: Cornelia Adolfsson.

Two fledgling Australian magpies (*Gymnorhina tibicen*). Image: Cornelia Adolfsson.

A juvenile ringtail possum *(Pseudocheirus peregrinus*) in its new enclosure. Image: Cornelia Adolfsson.

Greater
Under the Cove

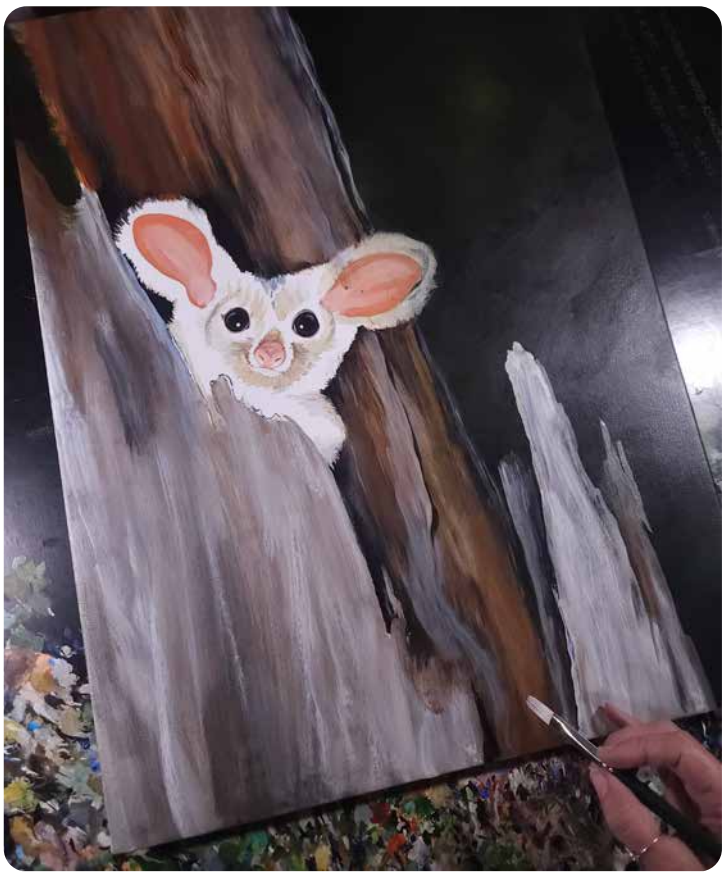
Natalie Jane Parker

Greater gliders (*Petauroides volans*) are one o disheartening that they are listed as endange old-growth forests. I love their cute faces, sof

I have been a member of the Australian Wildlife Society for a few years now. After reading in the summer edition of the Australian Wildlife magazine that the greater glider had been chosen as the Society's feature animal for 2024, I decided to paint this beautiful animal to help raise awareness and donate a portion of the sale price to the Guardians of the Greater Glider conservation program. Titled 'Under the Cover of Darkness', I started this painting in April 2024, and it took close to a month to complete. I used acrylic paints on canvas, and the artwork is currently for sale, hanging in Morpeth Art Gallery in the Hunter Valley, New South Wales.

Top left: Josh Bowell's photograph of the greater glider (*Petauroides volans*) was used as a reference for the painting. Image: Josh Bowell.

I have been a wildlife artist for over twenty-five years and am a member of several international art groups. One of these is Artist for Conservation. I knew before I started this painting, I hoped to submit it to their annual exhibition to promote further exposure to the plight of greater gliders. I was so pleased that my painting was selected for the virtual exhibit and companion book in June 2024. Artists for Conservation is based in Canada and is the world's leading group of artists supporting the environment. This non-profit organisation comprises a membership of five hundred nature artists from over thirty countries. This year's exhibit saw a record number of submissions, with 547 entries! This annual exhibition is in its seventeenth year, celebrating artistic excellence in depicting nature, raising awareness of conservation issues, and supporting organisations dedicated to them. Last



Gliders:
r of Darkness

of my favourite Australian animals. It is red due to land clearing and logging of t colours, and fluffy ears.

year, I was genuinely surprised to win a Medal of Excellence for my painting of two laughing kookaburras (*Dacelo novaeguineae*) and an Honourable Mention for my second entry of a young swamp wallaby (*Wallabia bicolor*).

I have a website where my artworks are available as prints, cards, and calendars, all made in Australia. Since May 2021, I have donated five percent of my monthly profits to wildlife organisations. My greater glider painting will be added to my website soon and can be found at www.natalieparkerprints.com.au.

I hope to raise awareness of these beautiful animals, not only in Australia but internationally. The more people are informed about the dire situation that greater gliders face, the more they can be supported and protected.

I must thank Josh Bowell for allowing me to use his amazing photography as a reference for this painting. It takes patience and dedication to find these animals in the wild and photograph them, which is a feat in itself. Living high up in the forest canopy, greater gliders are relatively silent animals spotted mainly by eye reflection.

More details about 'Under the Cover of Darkness' can be found on Morpeth Gallery's website at: www.morpethgallery.com

Top right: Medal of Excellence for the painting of two laughing kookaburras (*Dacelo novaeguineae*) and Honourable Mention for the entry of a young swamp wallaby (*Wallabia bicolor*). Image: Natalie Jane Parker.

Bottom: Progression of the greater glider (*Petauroides volans*) painting up to the final and completed piece. Images: Natalie Jane Parker.

Australian Wildlife Society
Conserving Australia's Wildlife since 1909 ®

Wildlife Fiction
SHORT STORY COMPETITION

The **Australian Wildlife Society's Wildlife Fiction Short Story Competition** is a national competition that seeks original short stories that entertain, convey a message, capture a moment, or evoke a certain mood about Australian wildlife (flora or fauna) while shedding light on the challenges they face in a modern world.

Winners receive a cash prize, a certificate, and their short story published in the *Australian Wildlife* magazine. Use your creative talents to raise awareness and let your words make an impact!

A Junior Prize of $250 and a Senior Prize of $750 will be Awarded

Rules of Entry:

1. The entry must be about a native Australian species – flora or fauna.
2. The entry must be the work of the entrant.
3. A junior is regarded between the ages of 8 to 17 years old.
4. A senior is regarded as 18 years and older.
5. The short story must be between 500 and 1,000 words. Short stories that do not adhere to this rule will be automatically disqualified.
6. By submitting an entry, entrants grant the Australian Wildlife Society rights to the short story. Entrants retain the copyright to their entry but accord the Australian Wildlife Society the right to use the short story in any of its marketing or promotional material arising therefrom.
7. There shall be no charge for entry, and entrants may only submit one entry.
8. The entry will be submitted in a Word document: single-spaced, Times New Roman, and font size 12. Start with a heading in font size 16, Bold, Title Case, followed by the author's first and surname, followed by the story. A short story Word template can be found here: bit.ly/SSTemp
9. The prize category (either 'Junior' or 'Senior'), the author's first and surname, and the story's title must be in the 'file name' and 'email subject line' of the entry submitted, e.g., Junior_John Smith_The Magical Marsupial. The entry will be submitted to info@aws.org.au
10. Directors of the Australian Wildlife Society or their families are ineligible to submit an entry.
11. The final result is at the discretion of the judges.

The Closing Date for Entries is 31 August 2024

The Winner Will Be Announced Towards the End of September

Saving Wildlife in South Australia

Dina De Ruyter, SA Native Animal Rescue Inc.

SA Native Animal Rescue Inc. is a not-for-profit organisation that started in November 2022 with a group of experienced wildlife carers with wildlife permits. We rescue sick and injured wildlife and, when well and rehabilitated, release them back into the wild. We aim to support our wildlife carers in the best way possible, which includes supplying them with food and equipment for wildlife.

In addition to specialising in birds and other small native species, our organisation is committed to researching information on vulnerable species such as the yellow-footed antechinus (*Antechinus flavipes*), native bush rat (*Rattus fuscipes*), and other small native animals that most people are unaware of. By doing so, we aim to educate members of the public on the required habitat and food sources these animals depend on. We believe in educating the public about native wildlife so that our wildlife has a better chance of survival. We also aim to highlight the reasons why we are losing our wildlife, such as the disappearing forests and green pathways due to urbanisation, in hopes of enhancing positive perceptions and actions towards our wildlife and ensuring that our native species persist well into the future.

We are delighted to share some short stories and images of a few species our wildlife carers have either rescued, rehabilitated, and released back into the wild and/or provided specialised information about to members of the public.

Yellow-Footed Antechinus

Nine yellow-footed antechinus were found under a fallen branch when a member of the public was clearing his property. Antechinus are marsupials. They are a protected species. They are classified as vulnerable in South Australia. Their back feet have a thumb (like the rat); however, they have no claw on this thumb. They have small cat-like teeth.

Top: Three noisy miners (*Manorina melanocephalaare*). Image: Maria Yatskova.

Bottom left: Rosie the ringtail possum (*Pseudocheirus peregrinus*). Image: Jill Caruso.

Bottom right: A juvenile yellow-footed antechinus (*Antechinus flavipes*). Image: Jill Caruso.

SA Native Animal Rescue's Logo. Images: Nuria Solsona, Jill Caruso, Aliya Piper, Dina De Ruyter, Charlotte Faulhaber, and Maria Yatskova.

Dina De Ruyter next to native bush rat (*Rattus fuscipes*) habitat. Image: Jill Caruso.

Robbie (L) and Roxie (R), the brushtail possums (*Trichosurus vulpecula*). Image: Bethany Badger.

The quickest way to tell the difference between an antechinus and a mouse is by looking at their head. An antechinus has a much pointier, long, narrow snout, unlike a mouse with a round head and nose. They are also larger than a mouse, with a body length of up to 165 millimetres. They also have a tail that is approximately the same length as its body. They have a white ring of fur around their eyes, doubled-lobed ears, and yellow feet, legs, and bellies. Unfortunately, most people mistake antechinus for ordinary house mice.

Ringtail Possum

Rosie, the ringtail possum (*Pseudocheirus peregrinus*), came into care weighing 49 grams. When she was old enough and able to look after herself, she was softly released with her mate on a property. She returned with triplets and is doing a great job as a first-time mum.

Seeing the dedication and around-the-clock support our carers provide our wildlife is admirable. It is extremely rewarding when animals are given another chance to live the life they deserve, free and in the wild, and successfully reproduce in their natural environment.

Purple-Crowned Lorikeet

Maisy, the juvenile, purple-crowned lorikeet (*Parvipsitta porphyrocephala*), was found on the footpath in front of McLaren Vale Primary School with a broken leg. After many trips to the vet, two weeks in splints and bandages, and weeks of physiotherapy to increase leg movement and strength, Maisy finally started socialising with other birds.

Maisy was paired with two young musk lorikeets (*Glossopsitta concinna*) because there were no other purple-crowned lorikeets to pair her with. Once they had all developed good flight strength and an aversion to humans, they were released in McLaren Vale, close to where Maisy was initially found and where there is a large population of rainbow, musk, and purple-crowned lorikeets.

Native Bush Rats

SA Native Animal Rescue received a telephone call from a lady in McLaren Vale who had found five bush rats alone in an abandoned car on her property with no mother in sight. When we first received them, we had to ensure they were native and not the common black or brown rat. After research and phone calls, we realised we had five baby native bush rats. We learnt a lot about them and enjoyed caring for and rehabilitating them back into the wild.

The native bush rat is a small omnivorous rodent (which means they eat fungi, grasses, fruits, seeds, and insects). They are found across Australia in woodland areas. They are usually nocturnal and elusive. Their numbers continue to decline due to feral predator predation and habitat loss.

Brushtail Possums

Roxy and Robbie, two brushtail possums (*Trichosurus vulpecula*), were brought into the Meadows Veterinary Centre by a member of the public, who said they were twins. However, there was 70 grams difference in

weight between them. As we did not have the mum, we could not check whether both teats were being used, which would alert us that they could be siblings. We often get brushtail possums with a joey in the pouch and an older one. We usually do not separate them. These two were successfully released together.

Koala

This story is dedicated to a koala (*Phascolarctos cinereus*) called Alphie. Alphie was a local koala who lived in our neighbourhood for many years. He was one of the reasons I became a koala carer. Alphie moved into our neighbourhood when he was a young, energetic koala. I saw him on many occasions in his favourite tree.

As a koala carer, I had Alphie in care on two occasions. In 2014, I rescued him as he was severely dehydrated during one extremely hot summer. The Adelaide Koala and Wildlife Centre in Plympton, South Australia, rehydrated him, and when he recovered, he was released. In 2017, he was hit by the neighbour's car as he was sitting in the middle of their driveway, and the neighbour did not see him. He was assessed by the Adelaide Koala and Wildlife Centre and was given all clear but was still extremely sore due to soft tissue injuries. He stayed with me for a while, then released in his favourite tree.

Unfortunately, at the end of last year, a group of people were looking at a koala near my place, and I went over to have a look. It was Alphie. Alphie was struggling and not in good condition. At this stage, he was about 14 or 15 years old. After an assessment, Alphie's teeth were completely worn down, and he had gut issues. Unfortunately, Alphie went to Koala Heaven. Rest in Peace, Alphie. You have taught me a lot about koala behaviour and the habitat you live in.

Noisy Miners

Noisy miners (*Manorina melanocephala*) are a protected native Australian species and one of the most misunderstood native birds in Australia. They are very territorial and are dedicated to protecting their babies. Noisy miners are honeyeaters and, as such, have an essential role in pollinating plants.

They are often accused of taking the territory of other smaller honeyeaters. The reality is that they are a successful species that takes advantage of our changing environment – caused by humans. Other honeyeaters and smaller birds need a larger scrub area and low vegetation to survive. As we continue to destroy these scrub areas necessary for these other small species, they will continue to disappear. The loss of these small species is sometimes blamed on the noisy miners, but this is not true.

We are incredibly grateful for the support provided by the Australia Wildlife Society. With this financial assistance, we can obtain resources for our wildlife carers, such as food supplies, incubators, enclosures, thermo-controlled heat mats, rescue baskets, syringes, and teats to help sick and injured wildlife with their rescue, rehabilitation, and release.

To find out more about the work of SA Native Animal Rescue, please visit bit.ly/SANARInc

Alphie the koala (*Phascolarctos cinereus*) when he was younger. Image: Dina De Ruyter.

A juvenile native bush rat (*Rattus fuscipes*) feeding. Image: Jill Caruso.

Maisy the purple-crowned lorikeet (*Parvipsitta porphyrocephala*) (Top). Image: Aliya Piper.

2024 UNIVERSITY RESEARCH GRANT WINNERS

The Australian Wildlife Society's University Research Grants are offered to honours or postgraduate students at Australian universities conducting research that contributes to the conservation of Australian wildlife (flora or fauna). Ten grants are awarded each year: one $5,000 scholarship and nine $3,000 grants.

The Dr Clive Williams OAM Memorial Wildlife Conservation Scholarship is awarded to the highest-ranked applicant of all our University Research Grants in honour of former Director Dr Clive Williams.

Grants may be used to purchase equipment and consumables, travel expenses related to field research, or attend a conference where the student presents their research.

THE AUSTRALIAN WILDLIFE SOCIETY IS DELIGHTED TO ANNOUNCE THE WINNERS FOR 2024:

GEORGE LESTER
(Dr Clive Williams OAM Memorial Wildlife Conservation Scholarship Recipient)

School of BioSciences,
The University of Melbourne.

Project Title:
Pollination Networks in East-Arnhem Land: Analysing Effects of Climate Change on Stingless Bees through DNA Metabarcoding of Foraged Pollen.

ALEXANDRA IKPE
School of Science, Technology and Engineering,
The University of the Sunshine Coast.

Project Title:
Tracking an Elusive Predator, Mature Male Tiger Sharks, Along Eastern Australia.

ALICE HOWIE
School of Natural Sciences,
Macquarie University.

Project Title:
Sound as an Emerging Technology to Monitor Biodiversity Across Seascapes.

EMMELINE NORRIS
Centre for Tropical Environmental and Sustainability Science,
James Cook University.

Project Title:
Utilising Drone-Based Thermal Imagery to Accurately Estimate the Abundance of the Endangered Spectacled Flying-Fox (*Pteropus conspicillatus*) and Model Population Trajectories.

LUKE FLORENCE
Department of Environment and Genetics,
La Trobe University.

Project Title:
Mycorrhizal Diversity in Australian Temperate Forests in the Context of Drought and Nitrogen Deposition.

ROSE LOWNDS
School of Science, Western Sydney University.

Project Title:
Determining the Distribution and Migratory Flyways of Bogong Moths (*Agrotis infusa*) Using Genetic and Stable Isotope Analyses.

JASMINE TOWLE
School of Biological Sciences,
The University of Adelaide.

Project Title:
Climate Change Impacts on Marine Invertebrates in Temperate Australia.

MATTHEW ROSE
Institute of Marine and Antarctic Studies,
University of Tasmania.

Project Title:
Collapsed Habitat Threatens Australian Marine Wildlife.

NATALIE GRASSI
School of Environmental and Conservation Sciences,
Murdoch University.

Project Title:
Does Fragmentation Alter Predator Diets?

REBECCA QUAH
School of Science, Edith Cowan University.

Project Title:
Is There Mush-Room for Bettongs? Resource Use and Availability for Bettong Reintroductions to Dirk Hartog Island.

How Do You Vaccinate a Wild Devil?

Dr Ruth Pye
Menzies Institute for Medical Research | University of Tasmania

A few thousand years ago, both the thylacine (*Thylacinus cynocephalus*) and Tasmanian devil (*Sarcophilus harrisii*) were found across the Australian continent. Following the arrival of the dingo, these two extraordinary carnivorous marsupial species underwent an almost synchronous extinction on mainland Australia. Dingoes never made it to Tasmania, so for the last 3,000 years the island state was the final refuge for the thylacine and the devil. In the 20th century, the thylacine was hunted to extinction by European settlers. The Tasmanian devil survived similar persecution, but a devastating disease now threatens its existence.

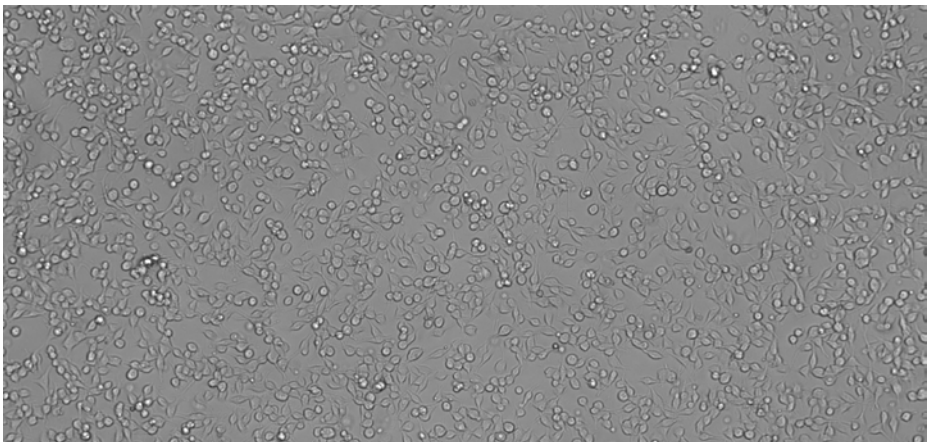
Devil facial tumour disease is an infectious cancer. These transmissible cancers are remarkable phenomena whereby the cancer cells are the infectious agent: there is no involvement of a virus, bacteria, or any other pathogen that we usually associate with infectious disease. The cancer cells are passed between individual devils during the biting behaviour that often occurs at feeding and mating. Devil facial tumour disease comprises two genetically distinct cancers. Devil facial tumour 1 was first observed in 1996 in the far northeast of Tasmania, and the first case of devil facial tumour 2 was found in 2014 in the southeast. Devil facial tumour 1 has now spread across almost the entire geographic range of the devil.

Prior to the emergence of devil facial tumour disease, the devil population was estimated at 53,000 individuals. That number had fallen to approximately 17,000 devils in 2020, and modelling predicts the continued decline of the species over the next decade. The devil is the top-order terrestrial carnivore in the Tasmanian environment. It is a specialised scavenger and opportunistic predator and plays a key role in maintaining the balance of Tasmania's delicate ecosystem. Although devil facial tumour disease has not yet resulted in the extinction of local devil populations, it has caused the 'functional extinction' of devils in areas hardest hit by the disease.

While there is evidence for naturally occurring immune and genetic responses to devil facial tumour disease amongst wild devils and an increase in devil density in at least one diseased study site, the devastating impact of devil facial tumour disease is still very apparent across the state. Consequently, the state government's Save the Tasmanian Devil Program partnered with the Australasian Wildlife Genomics group at the University of Sydney to undertake a population augmentation project in defined locations where devil facial tumour disease had decimated local devil populations. This project aims to maintain genetic diversity and a viable devil density at the study sites.

Vaccination against devil facial tumour disease is another approach to mitigate the effects of the disease. Developing a protective anti-devil facial tumour disease vaccine has been the quest of our Wild and Comparative Immunology research group at the Menzies Institute for Medical Research at the University of Tasmania for over a decade. We have learnt a lot from our initial vaccine trials, which relied on whole devil facial tumour cells as the antigen (protein) basis for the experimental vaccine. This approach resulted in anti-devil facial tumour 1 immune responses in the vaccinated devils, but ultimately the response was not protective for most of these devils when faced with a natural devil facial tumour 1 challenge. In 2020, we adopted a more technically advanced approach to designing a new vaccine. This approach has required in-depth genetic sequencing and analysis to identify antigens unique to the devil facial tumour cells. Our new vaccine will incorporate these antigens on a platform (in this case, a viral vector) like the AstraZeneca COVID-19 vaccine presents SARS-CoV-2 antigens. We expect to test this new devil facial tumour 1 vaccine on captive devils in early 2025. We are optimistic that this approach will initiate a more protective immune response against devil facial tumour 1 than our previous whole-cell vaccine did. Our current vaccine is

Top: A Tasmanian devil (*Sarcophilus harrisii*) is released after being examined.
Image: Dr Ai-Mei Chang.



Devil facial tumour 1 cells growing in a culture in the Menzies Institute for Medical Research laboratory at the University of Tasmania. Image: Dr Chrissie Ong.

targeting devil facial tumour 1, but a devil facial tumour 2 vaccine is also in our sights.

It is hard to exaggerate the challenge of developing a vaccine against a pathogen that is as novel and complex as devil facial tumour disease. But this is only the first step. Once we have an effective vaccine in hand, we will need to deliver it to a significant number of wild devils across Tasmania. While most vaccines are administered to people and domestic animals by subcutaneous or intramuscular injection, this is not practical for wildlife species. Rather than relying on the resource-intensive method of trapping and injecting individuals, vaccines targeting wild animals are increasingly being delivered in oral baits distributed across the landscape. The most well-known and successful example is the oral rabies bait vaccine program, which commenced in the late 1970s and has eliminated rabies from wild red foxes (*Vulpes vulpes*) across much of western Europe. Oral bait vaccines are currently in use or being tested in a variety of other settings, including: the United States against rabies in raccoons (*Procyon lotor*) and coyotes (*Canis latrans*); the United Kingdom against tuberculosis in badgers (*Meles meles*); and the United States against white-nose syndrome in little brown bats (*Myotis lucifugus*).

Our research group is learning a great deal from these programs about how best to develop an oral bait vaccine distribution system. In 2020, we published a proposal for an oral bait vaccine against devil facial tumour disease in the *Expert Review of Vaccines* journal. An honours student started his project with us in 2021 to determine bait flavour preferences amongst devils and the prevalence of bait uptake by off-target species. We went on to identify a suitable bait biomarker for use in devils so that a blood sample would allow us to determine which devils consumed baits within the months prior to the blood sample collection. We currently have two PhD candidates in our group continuing this bait delivery research, which includes the design of a 'smart' bait dispenser that will release baits only when a devil, rather than another species, approaches the dispenser.

As mentioned above, we are still trying to test whether our current candidate devil facial tumour 1 vaccine will protect devils against a devil facial tumour 1 challenge or if the vaccine will require further iterations. But we are concurrently working on the delivery system because, as a lead researcher from the bat white-nose syndrome vaccine project advised us, "*developing a bait delivery system can take a long time – you do not want to delay your vaccine roll out in the wild because you do not have an effective method to deliver the vaccine*".

Devil facial tumour disease is an aggressive malignant cancer that kills most devils within six to twelve months of the tumour first appearing. It continues to be responsible for the deaths of thousands of devils and threatens the existence of the species. The disease threatens its top-order carnivore and the unique Tasmanian environment. Many of us are acutely aware of what was lost when the thylacine became extinct. Our research group is hopeful that history will not repeat with the extinction of another top-order carnivorous marsupial. We believe that a protective vaccine against devil facial tumour disease will play a role in rebuilding a resilient devil population across Tasmania.

Dr Samantha Fox (Save the Tasmanian Devil Program) and Dr Ruth Pye (Menzies Institute for Medical Research) collects blood from a Tasmanian devil (*Sarcophilus harrisii*) during a field trip. Image: Prof. Carolyn Hogg.

Magpies

Struggle with Man-Made Noise

Grace Blackburn

Man-made noise, which arises from human activities, is increasing globally faster than ever before. Although primarily a concern in urban environments due to traffic networks, infrastructure development, and urban expansion, man-made noise is an issue even in protected natural areas away from cities and urbanisation. Research into the effects of man-made noise on non-human animals has increased substantially in the last twenty years, and adverse effects have subsequently been reported across insects, fishes, reptiles, birds, and mammals. The consequences of man-made noise include changes in species abundance, reproductive success, cognition, sleep, foraging, and vocal communication. Understanding the effects that this pervasive stressor has on animals is vital for us to mitigate these impacts and conserve wildlife.

Man-made noise can be an issue for animals for a number of reasons. Firstly, and perhaps most obviously, it can drown out noises that are important for animals, known as acoustic masking. For example, many animals call to attract mates or, conversely, listen out for the calls of potential mates. If loud man-made noise, such as traffic noise, is occurring at the same time as animals are calling for mates, then the chances of a potential mate hearing and appropriately responding to this call may be drastically reduced. Secondly, man-made noise may be interpreted by animals as a stressful or threatening stimulus, which may cause animals to hide or flee from noise. Lastly, man-made noise may distract individuals and divert their attention from essential behaviours such as foraging or parental care, which can have significant long-term effects.

Magpies are Everywhere in Cities

Australian magpies (*Gymnorhina tibicen*) are found all over Australia and often inhabit residential parklands and open fields. Nine subspecies of Australian magpies are found in Australia, New Guinea, and New Zealand. My research focuses on the Western subspecies of Australian magpie (*Gymnorhina tibicen dorsalis*), a cooperatively breeding, group living subspecies found in the south-west of Western Australia.

Magpies are highly vocal birds, relying on vocalisations to communicate with groupmates, offspring, and rival magpie groups. Like many birds, magpies produce alarm calls to warn groupmates of danger; interestingly, magpies have been shown to encode information about the threat in their alarm calls. Through slight changes to the pitch and rate of their vocalisations, magpies can produce alarm calls that tell other magpies how far away the predator threat is, as well as what type of predator it is!

Magpies also have a keen sense of hearing and use this when foraging. These birds have been shown to use acoustic cues when foraging for prey in the soil, meaning their food intake is linked to their ability to hear the sounds of prey in the earth.

Since magpies are primarily found in urban areas (where man-made noise is generally the loudest and most frequent), are highly vocal, and need to hear when foraging, man-made noise poses a significant threat to them.

Man-Made Noise and the Behaviour of Magpies

To investigate the effect of man-made noise on the behaviour of magpies, we conducted 333 behavioural focals on individual magpies, in which we recorded all behaviours that magpies were exhibiting, as well as whether there was any man-made noise occurring, which allowed us to investigate how the behaviour of magpies changed when man-made noise was present.

These focals revealed that the presence of man-made noise significantly affected the foraging and vigilance of magpies. When man-made noise was present, magpies spent less time looking for food and were less

Top: A female magpie (*Gymnorhina tibicen dorsalis*) foraging in an urban park, with a juvenile magpie in the background. Image: James Blackburn.

Two magpies (*Gymnorhina tibicen dorsalis*) in an urban park in Perth, Western Australia. Image: James Blackburn.

efficient at finding food. They also spent more time vigilant and on the lookout for danger. These changes to behaviour may arise due to man-made noise being viewed as a distracting or threatening stimulus for magpies or because it may reduce the ability of magpies to hear alarm calls warning them of danger. Regardless of the mechanism behind these behavioural changes, this increased vigilance and decreased foraging could have severe consequences for the body condition of adult magpies and their ability to feed their young.

Man-Made Noise and the Vocalisations of Magpies

We also wanted to look at whether magpies changed their vocalisations when man-made noise was occurring, as this is a commonly reported consequence of man-made noise in animals. To do this, we recorded and analysed the carols of female magpies both when man-made noise occurred and when it did not occur. Carols are the main territorial song of magpies, used when advertising territory ownership or defending territories against other magpies, and are, therefore, an essential component of magpie communication.

Upon analysis of magpie carols, we found that man-made noise significantly affected both the rate at which magpies carolled and the pitch (known as the frequency) of their carols. Magpies carolled less often when man-made noise was present compared to when it was not, likely as a way of saving energy when their carols are unlikely to be heard. Magpies also significantly increased the peak frequency (the frequency at which the amplitude is loudest, and hence the component of the carol with the highest energy content) when man-made noise was present. As man-made noise is often low frequency, increases in the frequency of vocalisations so that they do not overlap with the frequency of man-made noise can help maintain communication even when noise is present. While changes to the rate and frequency of carols may help magpies maintain communication when man-made noise is present, it may also negatively affect vocal communication for this species.

Reducing the Effects of Man-Made Noise on Wildlife

Man-made noise is only expected to continue to increase into the future, meaning the effects of this noise on animals will also continue to increase. However, there are some things we can do to reduce the noise we create and help our wildlife. Our gardens can provide refuge for birds, insects, and reptiles. By planting native plants and creating dense vegetation, we can create quieter spaces for birds to forage and hang out. These spaces will also act as cool refuges for animals in the summer months. A birdbath will make these spaces even more enticing. Choosing to cycle or take public transport to work, even once a week, can help reduce traffic on the roads and noise near roads. Even minor things like closing doors and windows to keep noise in, or listening to music with earphones when outside, can help to reduce the man-made noise that wildlife must deal with. By making small changes to help our urban wildlife, we can help to ensure biodiversity is conserved for future generations.

Two magpies (*Gymnorhina tibicen dorsalis*) singing together (chorusing). Image: James Blackburn.

Grace is a PhD Candidate at the University of Western Australia. Her research focuses on the effects of man-made noise on Western Australian magpies (*Gymnorhina tibicen dorsalis*) and explores how cognition can help these birds better cope with environmental stressors. Grace is passionate about sharing her research with the public and helping to educate people on how they can help wildlife living in urban areas.

Unveiling the Dynamics of Nest Predation: Insights from Eastern Yellow Robins

Nicholas Yu

Nest predation drives evolutionary dynamics in avian communities, profoundly influencing reproductive success and population dåynamics. This phenomenon has garnered significant attention from ornithologists, illuminating the intricate interplay between predators and prey. In a recent study published in *Australian Field Ornithology* (2023), Nicholas Yu delves into the intricacies of nest predation, focusing on the plight of eastern yellow robins (*Eopsaltria australis*) in urban landscapes of eastern New South Wales.

Methods and Observations

The investigation, conducted in November 2022, unfolds through meticulous video surveillance of an eastern yellow robin nest nestled within the confines of a small-leaved privet in Macquarie Park. Riveting footage was captured from a single trail camera, portraying the daily struggles of the avian inhabitants. The videos unveil a saga of parental dedication intertwined with relentless predation pressures.

Predation Dynamics

The documented footage encapsulates a series of harrowing encounters, depicting the valiant efforts of adult eastern yellow robins to safeguard their offspring against an array of adversaries. A poignant scene unfolds as a red wattlebird (*Anthochaera carunculata*) launches audacious assaults on the nest, met with fierce resistance from the vigilant robins. Subsequent footage unveils the grisly reality of nest predation, with an eastern ringtail possum (*Pseudocheirus peregrinus*) and a pied currawong (*Strepera graculina*) emerging as formidable predators, preying upon vulnerable nestlings.

Insights and Implications

The findings shed light on the multifaceted nature of nest predation, elucidating the pivotal role played by both avian and mammalian predators in shaping avian reproductive success. The observation of eastern ringtail possums (*Pseudocheirus peregrinus*) exhibiting carnivorous behaviour unveils a hitherto unexplored facet of their ecological niche, challenging conventional perceptions of their dietary preferences. Furthermore, the study underscores the profound impact of urbanisation on avian communities, with burgeoning populations of pied currawongs exacerbating predation pressures on vulnerable passerines.

An adult eastern yellow robin (*Eopsaltria australis*) feeding one of the chicks inside the nest. Image: Nicholas Yu.

Conclusions

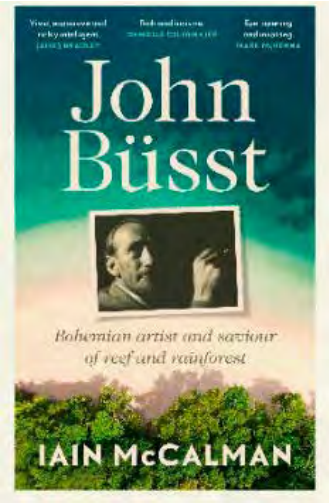
In conclusion, the study serves as a poignant reminder of the intricate web of interactions characterising avian ecosystems. By unravelling the dynamics of nest predation, this research not only enhances our understanding of avian ecology but also underscores the urgent need for conservation initiatives aimed at mitigating the adverse impacts of urbanisation on vulnerable avian populations. As we delve deeper into the mysteries of nature, it becomes increasingly apparent that only through concerted efforts can we hope to safeguard the rich tapestry of life that adorns our planet.

An eastern ringtail possum (*Pseudocheirus peregrinus*) predating one of the eastern yellow robin (*Eopsaltria australis*) chicks. Image: Nicholas Yu.

A pied currawong (*Strepera graculina*) removing one of the eastern yellow robin (*Eopsaltria australis*) chicks from the nest. Image: Nicholas Yu.

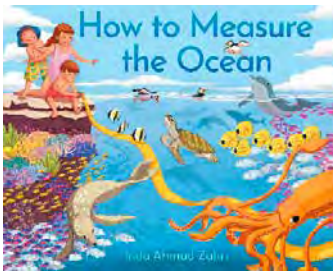
An eastern yellow robin (*Eopsaltria australis*) defending the nest from a red wattlebird (*Anthochaera carunculata*). Image: Nicholas Yu.

Book Reviews



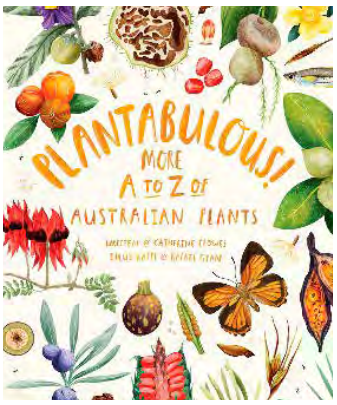
John Büsst: Bohemian Artist and Saviour of Reef and Rainforest – *Iain McCalman*

As the Great Barrier Reef faces its fifth mass bleaching, the story of Büsst's fight to protect the Reef showcases what individuals can achieve when faced with environmental and social crisis. The author illustrates how Büsst, an artist without scientific credentials, influenced government and science leaders to shape environmental policy, leading campaigns to safeguard the fragile ecosystems of the lowland rainforests and the iconic Great Barrier Reef from destructive practices. Be inspired by this incredible true story that will ignite a passion for conservation in all nature lovers.
Publisher: NewSouth Publishing
RRP: $36.99



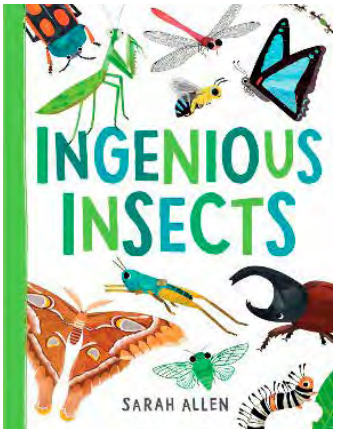
How to Measure the Ocean – *Inda Ahmad Zahri*

The ocean is a vast and ever-changing entity, making it a challenge to measure. Delve into the mysteries of the ocean with a poetic journey that explores its depths and shallows. Measuring the ocean can be challenging, but that does not mean it is impossible. From a large marine fish, the whale shark (*Rhincodon typus*), to a small marine fish, a leafy seadragon (*Phycodurus eques*), navigate the ocean's vastness and discover the beauty and complexity beneath the surface.
Publisher: Allen & Unwin
RRP: $24.99



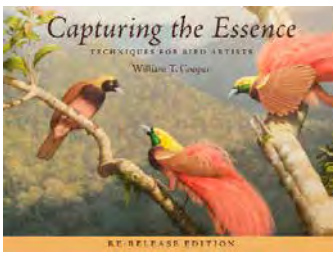
Plantabulous! More A to Z of Australian Plants – *Catherine Clowes and Rachel Gyan*

Australia's flora is remarkable, from fire-resistant species like the Waratah, which has a lignotuber that contains food and buds that will regrow after a fire, to pollution-fighting powerhouses like the Juncus, which can remove pollutants by storing them in its roots and stems. Packed with fascinating facts, activities, and illustrations, *Plantabulous!* will show you how magnificent Australia's native plants are!
Publisher: CSIRO Publishing
RRP: $29.99



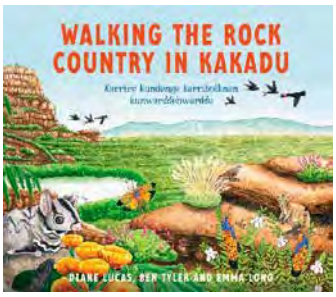
Ingenious Insects – *Sarah Allen*

Step through the seasons with some of Australia's most exciting insects, from the Macleay's swallowtail (*Graphium macleayanum*), a beautiful butterfly identified by the tails on its hind wings, and noisy greengrocer cicadas (*Cyclochila australasiae*) that chirp summer songs to the blue-banded bee (*Amegilla cingulate*), a burrowing bee that digs holes for its brood, and Blue Mountains fireflies (*Atyphella lychnus*) that synchronise their flashes into a spectacular light show. This book is an adorable introduction to our unique and charming bug life.
Publisher: Affirm Press | **RRP:** $22.99



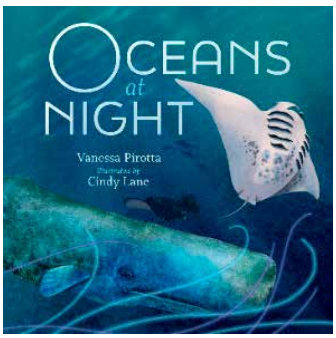
Capturing the Essence: Techniques for Bird Artists – *William T. Cooper*

William T. Cooper, hailed as the top bird illustrator by Sir David Attenborough, was a mentor to many aspiring wildlife artists. His book, *Capturing the Essence*, is a practical guide filled with valuable tips and techniques for painting birds. Cooper's step-by-step instructions will help you bring your feathered subjects to life, whether you prefer oil, watercolour, or acrylic. This book is not just for bird enthusiasts – the skills and principles taught here can be applied to painting various natural history subjects. Initially published in 2011, this re-release ensures that a new generation of artists can benefit from Cooper's expertise.
Publisher: CSIRO Publishing | **RRP:** $59.99



Walking the Rock Country in Kakadu – *Diane Lucas, Ben Tyler, and Emma Long*

Explore the stunning landscapes of Australia's Kakadu National Park during the early dry season, known as yekke. Join the authors as they guide us through the rich tapestry of stories, knowledge, and natural beauty in one of Australia's oldest ecosystems, introducing Kundjeyhmi language, one of the Bininj Kunwok languages of Kakadu and western Arnhem Land, along the way. From crimson finch (*Neochmia phaeton*) or 'almaykorlo', that dive from rock pandanus trees to drink from the waterhole to the Leichhardt's grasshopper (*Petasida ephippigera*) or 'alyurr', which are endemic to the sandstone escarpment and best spotted on pityrodia bushes, there is plenty of wildlife to discover in Kakadu.
Publisher: Allen & Unwin
RRP: $29.99



Oceans at Night – *Vanessa Pirotta and Cindy Lane*

Dive into the exciting world beneath the waves after the sun sets. As night-time nears, a world of animals comes alive in our oceans. Little penguins (*Eudyptula minor*), the world's smallest penguin, return to shore after they have spent the day fishing at sea, while the majestic manta (*Mobula birostris*) gracefully glides through the water, feasting on tiny zooplankton. Prepare to be captivated by the nocturnal activities of our ocean marine life.
Publisher: CSIRO Publishing
RRP: $24.99

Nature's Sexual Spectrum – *Josh L. Davis*

Nature's Sexual Spectrum examines the wide range of sexual behaviours, biology, and reproduction in nature, highlighting same-sex behaviours and courtship in various species. The book delves into the complexity of sexual reproduction and determination, including the influence of genes, hormones, environment, and chance. Examples include turtles with sex determined by egg incubation temperature and butterflies with male and female biological tissue. The author challenges readers to reconsider assumptions and prejudices by showcasing overlooked animal and plant behaviours in nature.
Publisher: CSIRO Publishing | **RRP:** $29.99

WILDLIFE PRESERVATION SOCIETY
OF AUSTRALIA LIMITED TRADING
AS AUSTRALIAN WILDLIFE SOCIETY

Australian Wildlife Society
Conserving Australia's Wildlife since 1909 ®

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 New South Wales. 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 wildlife conservation organisation. Our mission is to conserve Australia's wildlife (flora and fauna) through national environmental education, public awareness, advocacy, hands-on conservation work, and community involvement. AWS is a tax-deductible gift recipient and registered with the Australian Charities and Not-for-profit Commission. Its public fund is listed on the Register of Environmental Organisations under item 6.1.1 of subsection 30-55(1) of the Income Tax Assessment Act 1997. 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, 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 our wildlife conservation projects across Australia. Some examples listed below:

- Supporting wildlife rescue groups rehabilitating injured wildlife.
- Active involvement in national environmental education.
- Lobbying and advocating for the protection of wildlife habitat.
- Offering university grants and scholarships to honours or postgraduate students at Australian universities.
- Offering annual conservation group grants.
- Conservation activities during Australian Wildlife Week.
- The presentation of our four prestigious annual awards.
- Platypus Alliance conservation activities to preserve platypus populations and other semi-aquatic air-breathing species.
- Our #SnipRingsforWildlife Campaign to protect wildlife from the risk of entanglement and death.

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

L to R: (Standing) Ken Mason, Dr Robin Crisman, Trevor Evans, Brian Scarsbrick AM, John Creighton, and Suzanne Medway AM. L to R: (Seated) Stephen Grabowski, and Patrick Medway AM.

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, and 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.

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 that are left to us by generous supporters. Please ask the Executor to notify us in writing of the bequest by sending a letter to the National Office or via email, 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: 9/121 Queen Street,
CAMPBELLTOWN NSW 2560, Australia

Tel: +61 4 24 287 297
Email: secretary@aws.org.au
ABN: 13 817 470 816
Web: aws.org.au/bequest-information/

Australian Wildlife Society
Conserving Australia's Wildlife since 1909

REGISTERED CHARITY
acnc.gov.au/charityregister

bitly

Membership Form

Membership

Become a member of the Australian Wildlife Society

Australian Wildlife Society
Conserving Australia's Wildlife since 1909 ®

Simply fill out this form

Name: .....

Address: .....

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

Email: ..... **Phone:** .....

Membership category (please tick)

- ○ Student (conditions apply): $0
- ○ Individual (hardcopy magazine): $55
- ○ Family (hardcopy magazine): $70
- ○ Concession (pensioner, student, and 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 (hardcopy magazine): $150
- ○ Family (hardcopy magazine): $190
- ○ Concession (pensioner, student, and 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)

Membership: all prices include GST

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
9/121 Queen Street,
CAMPBELLTOWN NSW 2560
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

Membership Benefits

Magazine: Receive the quarterly issue of *Australian Wildlife* via email or post to keep up-to-date with the collective work promoted nationally.

E-Newsletter: Receive the monthly e-newsletter. Keep up-to-date with news from our members and on the work of the Society.

AWS Portal: Access the Members' Resource Centre – your destination for resources and materials on various wildlife-related topics.

Social Media: Contribute to our social media platforms: Instagram, Twitter, Facebook, LinkedIn, YouTube, and Website.

Right to Vote: You have the right to vote on important matters at Society general meetings (financial members only).

Other Benefits: Awards, Scholarships, Grants, and the opportunity to network with like-minded people.

LEAVE A BEQUEST IN YOUR WILL

If you would like to find out how to leave a bequest to the Society or how your bequest can make an impact, please download our bequest information pack.